TREND MICRO™

TippingPoint™ Threat Protection System (TPS)

Local Security Manager User Guide

Actionable threat defense against advanced targeted attacks.

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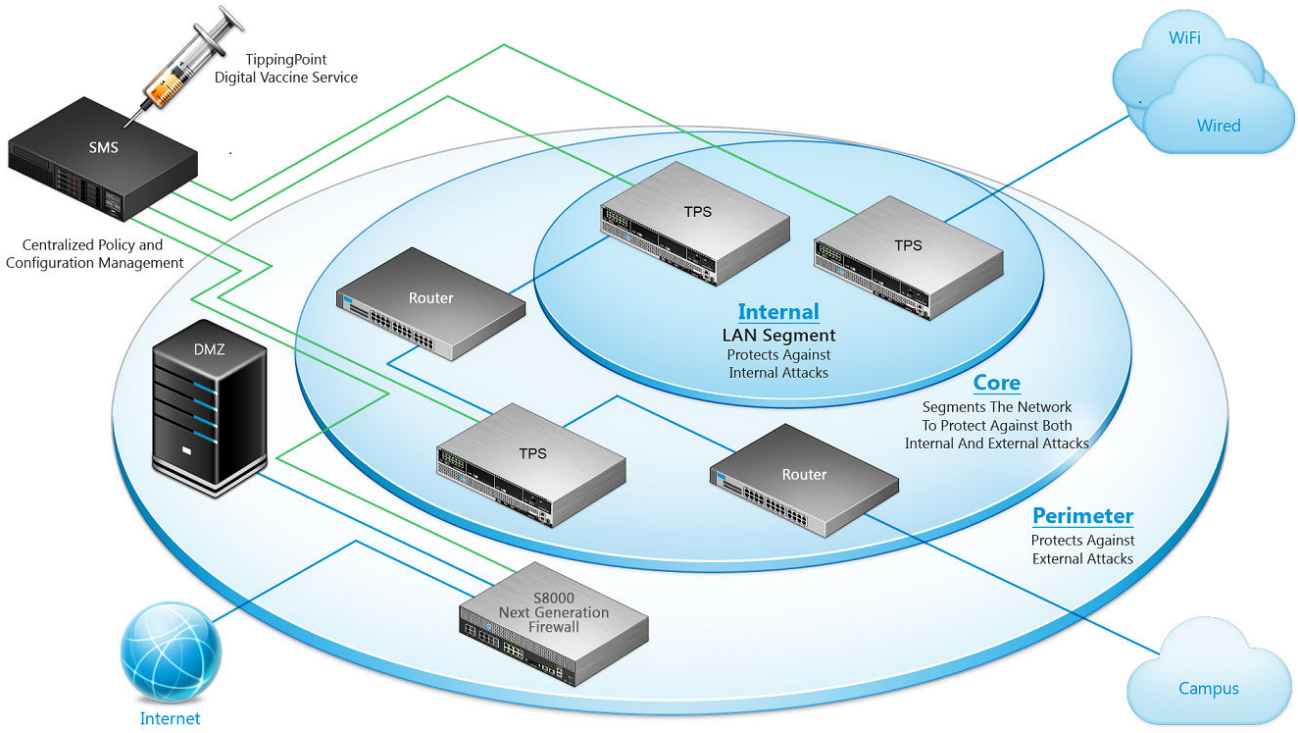
TPS deployment

The Threat Protection System (TPS) helps protect your network by scanning, detecting, and responding to network traffic according to the filters, action sets, and global settings that you set up and maintain in the Local Security Manager (LSM) client. Each device provides intrusion prevention for your network according to the amount of network connections and hardware capabilities.

You can install a single TPS at the perimeter of your network, at the network core, on your intranet, or in all three locations. The following diagram shows an example of a corporate network with the TPS deployed to a variety of locations.



How the TPS protects your network

The TPS contains a custom engine, the Threat Suppression Engine (TSE), that detects and blocks a broad range of attacks at wire speeds. The TSE is a flow-based network security engine, in which each packet is identified as a component of a flow and each flow is tracked in the connection table on the device. A flow is uniquely identified by its packet header information:

- IPv4 or IPv6 protocol (ICMP, TCP, UDP, other)
- source and destination IP addresses
- source and destination ports

The TSE reconstructs and inspects flow payloads by parsing the traffic at the application layer. When a packet matches an IPS filter, the device handles the packets based on the action set configured on the filter. For example, if the action set is **Block**, then the packet is dropped and subsequent packets from the same flow are dropped without inspection. The device provides default actions to block or permit traffic with options to quarantine or rate-limit traffic and to notify users or systems when an action executes. Logging options are also available to review the types of traffic that the device filters. You can customize the default action sets, or create your own based on your network requirements.

Learn more about configuring filters.

LSM prerequisites

Before configuring the LSM, check the *Release Notes* for:

- a summary of new features included in the interface
- version-specific information
- browser and installation considerations
- late-breaking information that supersedes this document

Initial setup and installation

Before you can log in to the LSM web interface, complete the initial hardware installation and setup, and connect the appliance to the network. For instructions on installation and setup, see the detailed installation instructions for your product.

Note

The device blocks traffic until it has completed the boot sequence.

TOS upgrades

Plan TOS upgrades during a scheduled maintenance window.

Before you perform a TOS upgrade, consider the following:

- Refer to the TPS release notes for information specific to your TOS, including Digital Vaccine packages, migration, rollbacks, and traffic interruptions.
- On vTPS devices, the flow of traffic is interrupted during a TOS upgrade and during a reboot of the device.
- Verify that a recent license package is installed on the device and if necessary, download and install a new license package from the TMC. Without a recent license package, the device reverts to its unlicensed throughput.
- Maximize the space on your device by removing old TOS versions and packet traces. This ensures a successful installation and allows for a TOS rollback, if necessary. Each device stores a maximum of three previous TOS versions that you can roll back to. If all three rollback slots are full, the oldest version gets overridden when you perform the TOS upgrade. To preserve the oldest TOS version from being overridden, specify and delete another TOS version before you upgrade your TOS. You can remove previous TOS versions by using the LSM (**System** > **Update** > **System, DV, Licenses** > **Software Versions**), the SMS, or the CLI. For complete information on using the SMS or CLI, refer to your product documentation.

Deploying a TPS device

The following guidelines provide important deployment information:

- **Initial setup** – After you power on, the setup wizard on the console port terminal runs through its initial checks and configurations.
- **Powering on after a system shutdown** – On the 440T TPS device only, after the device is shut down using the `halt` command, you must completely disconnect power—by unplugging the unit or by turning off the power switch on the back of the unit—*for at least 60 seconds* before attempting to power on the device again. For the 2200T and TX Series devices, power can be removed by holding down the front panel power button for 5 seconds, and restored by pressing the power button.
- **Traffic handling on initial setup** – The device blocks traffic until the device has completed the boot sequence. After the boot sequence completes, the device inspects traffic by using the Default inspection profile.

Important

On TX Series devices, any bypass I/O modules remain in bypass mode until you remove them from bypass mode. To change the module from bypass mode to normal mode using the LSM, select **System -> High Availability -> Zero-Power HA**. To configure this using the SMS or device CLI, refer to the respective documentation. Rebooting the TPS does not change the bypass mode of the bypass I/O module.

- **Device management** – You can manage your TPS device using the Security Management System (SMS), Local Security Manager (LSM), or the Command Line Interface (CLI).

Important

When you manage a TPS or vTPS device with the SMS, always distribute an inspection profile to all segments to begin protecting network traffic. By default, when you add a vTPS or TPS device, all filter categories are disabled in the Default security profile. When a TPS or vTPS device is unmanaged or deleted, there is no change in the filters. For information about device management, see the *Security Management System User Guide*.

- **Virtual segments and IPS profiles** – Rather than edit the settings in the default IPS profile, we recommend that you preserve the default IPS profile. To apply your own IPS profile, create a copy of the default IPS profile and edit the virtual segments.
- **Idle timeout period** – By default, when there has been no LSM or CLI activity for 15 minutes, connection to the device times out. The idle timeout period was reduced from 60 minutes for improved security, and is configurable from the LSM (under **Authentication > Authentication Settings**) or from the CLI. From the `aaa` context, the `login cli-inactive-timeout` and `login lsm-inactive-timeout` commands configure the CLI and LSM timeout periods, respectively. For more information, see the *Threat Protection System Command Line Interface Reference*.
- **Sending Tech Support Reports via email** – If you encounter any issues, create a Tech Support Report (TSR) for each issue you wish to submit. To send a TSR by email, use the following steps:

  1. Create a TSR using the LSM (**Tools > Tech Support Report**). Or, from the CLI, use the **`tech-support-report`** command. If the TSR times out on the LSM, create a TSR from the CLI.
  2. Use the LSM to export the file to your local system.

3. Contact Support to open a case and provide a detailed summary of the issue.
4. Send the TSR file as an email attachment to your corresponding Support agent.

Screen resolution

The minimum screen resolution is 1366 x 768. For best results set your screen resolution to 1440 x 900. Lower resolutions might not fully display the contents of some LSM pages.

Logging in to the LSM

The TPS provides simultaneous support for up to 10 web client connections, 10 SSH (for CLI) connections, and one console connection. You can also log in using the Command Line Interface (CLI).

After completing the installation steps—outlined in the detailed installation instructions for your product—log in to the LSM using a supported browser.

1. Install your product as described in the installation instructions.
2. Using a supported browser, enter `https://<TPS ip address or hostname>` in the web browser.

   Note

   The TPS uses a factory-default certificate to secure HTTPS communications from your web browser to the device. When you log in to the LSM, an Untrusted Authority warning and a prompt asking if you want to trust the certificate are displayed. You can save the certificate to the Trusted Root Certificate store to avoid this warning.

   The LSM login page is displayed in the browser.
3. Enter your username and password.
4. Click **Log On**. The LSM confirms that your username is valid on the device. If the username is valid, the LSM opens and displays the Dashboard. If you enter an invalid username, the LSM login page is displayed again.

To exit the LSM, click the Log Off link in the upper-right corner of the page.

Note

When there has been no LSM activity for 15 minutes, connection to the device times out.

Your LSM user role controls what you can see and do within the LSM. User roles have specific capabilities assigned that determine if you have full read and write access or read-only access. *Learn more* about user roles.

Setting up your browser

Because the LSM manages the device through a web browser, take the following security precautions. Failure to follow these security guidelines can compromise the security of your device.

- Turn off browser features such as password caching, which are inappropriate for security use.
- The LSM only accepts encrypted HTTPS connections.

CAUTION!

Check the release notes for supported browsers and use the most current version that is listed.

For the best user experience, consider the browser recommendations that follow.

Internet Explorer

Change your cache setting in Internet Explorer for improved browser reliability with TippingPoint devices. Open the Internet Options for your browser (**Tools > Internet Options**). On the General tab, select the **Settings** option for Temporary Internet Files. In the Check for new versions section, select **Every visit to the page**. Save these settings.

Cookies for previous versions of the LSM might conflict with cookies in the updated version. If the browser receives `404 Page Not Found` errors or displays blank LSM frames, the cookies on the computer might be out of sync. To remedy this, delete the existing cookies and open a new session. On the General tab of the Internet Options dialog, click **Delete Cookies**. Restart Internet Explorer, connect to the LSM, and continue as before.

Mozilla Firefox

You cannot add certificate exceptions when you manage an IPv6 device on an IPv6 network with Firefox 4 or later. To add a certificate exception in an IPv6 environment, use a different browser or the CLI.

If your browser receives `404 Page Not Found` errors or displays blank LSM frames, the cookies on the computer might be out of sync. To resolve these issues, clear the cache, delete the cookies, and restart the browser.

Pop-Up Blocking

If your browser has pop-up blocking enabled, some elements in the LSM might not display correctly. Enable pop-ups for the LSM by including the device's URL in your browser's permitted pop-up settings.

Working with filters

The TPS uses Digital Vaccine filters to police your network and to screen out malicious or unwanted traffic. In addition to the Digital Vaccine filters, the TPS also provides Traffic Management filters, which are custom filters that react to traffic based on source IP address, destination IP address, port, protocol, or other defined values. Traffic management filters are applied to traffic before Digital Vaccine filters. Depending on how the filters are configured, traffic might require further inspection.

The Digital Vaccine package

Digital Vaccine filters are contained in a Digital Vaccine package. Your TPS comes with a Digital Vaccine package installed and configured so that your network can be protected as soon as you start the device. After setting up the TPS, you can still customize the filters in the Digital Vaccine through the LSM. To ensure that you have the most up-to-date Digital Vaccine package, download the latest package from the Update page in the LSM. *Learn more* about updating your device.

The filters within the Digital Vaccine package are designed to protect the network from specific exploits and to adjust for attack permutations of Zero Day Initiative (ZDI) threats. These filters include traffic anomaly filters and vulnerability-based filters. Vulnerability-based filters are designed to protect the network from an attack that takes advantage of a weakness in application software. For viruses that are not based on a specific vulnerability in software, the Digital Vaccine provides signature filters.

Digital Vaccine updates occur regularly. When a critical vulnerability or threat is discovered, Digital Vaccine updates and distributions occur immediately. *Learn more* about how to configure your TPS device to automatically receive these updates (**System > Update**).

Tip

In addition to providing a download location for Digital Vaccine packages, the TMC also provides Digital Vaccine product documentation that includes more detailed information about the filters included in the Digital Vaccine package, filter updates, and other related information.

For organizations that experience heavier risk factors for threats that go beyond the scope of the standard Digital Vaccine coverage, additional subscription services are available. These services include:

- Reputation Feed — provides reputation filters for suspect IP addresses and domains.
- Malware Filter Package — provides advanced malware protection.

To register for a Digital Vaccine subscription service, contact your customer representative.

Filter components

TPS filters have the following components, which determine the filter type, global and customized settings, and how the system responds when the TSE finds traffic matching the filter:

- **Category** — Defines the type of network protection that the filter provides. This category also enables you to locate the filter and control the global filter settings using the Category Setting configuration.
- **Action set** — Defines what occurs when the system detects traffic that matches the filter.
- **Adaptive Filter Configuration State** — Enables you to override the global Adaptive Filter configuration settings so that adaptive filtering does not affect the filter. *Learn more* about adaptive filtering.
- **State** — Indicates if the filter is enabled or disabled.

Category settings

Use category settings to configure global settings for all filters within a specified category group. Digital Vaccine filters are organized into groups based on the type of protection provided:

- **Application Protection Filters** defend against known exploits and exploits that can take advantage of known vulnerabilities targeting applications and operating systems. This filter type includes the subcategories Exploits, Identity Theft, Reconnaissance, Security Policy, Spyware, Virus, and Vulnerabilities.
- **Infrastructure Protection Filters** use protocols and detect statistical anomalies to protect network bandwidth and network infrastructure elements (such as routers and firewalls). This filter type includes the subcategories *Network Equipment* and *Traffic Normalization*.
- **Performance Protection Filters** block or rate-limit traffic from applications that can consume excessive bandwidth, leaving network resources available for use by key applications. This filter type includes the subcategories *IM*, *P2P*, and *Streaming Media*.

Use category settings to assign global configuration settings to filters in a subcategory. For example, if you decide not to use any filters to monitor P2P traffic, you can change the category settings for the Performance Protection P2P filter group to disable these filters. Category settings consist of the following global parameters:

- **State** — Determines whether filters within the subcategory are enabled or disabled. If you disable a category, you disable all filters in the category.
- **Action Set** — Determines what occurs when traffic matches a filter. If you configure the *Recommended* action set, filters within the category are configured with the settings that the Digital Vaccine team recommends. If required, you can override the category setting on individual filters by editing the filter to define custom settings.

Filter override settings

For the best system performance, use global category settings and the *Recommended* action set for all Digital Vaccine filters. However, in some cases, you might need to override the category settings and recommended action for individual filters because of specific network requirements, or in cases where the recommended settings for a filter interact poorly with your network.

Filter override settings apply custom settings to the filter in the Security Profile. After you customize a filter, the global Category Settings that specify the filter State and Action does not affect it.

Filter limits and exceptions

Limits and exceptions change the way filters are applied based on IP address. For example, you can specify a limit setting so that filters only apply to specific source and destination IP addresses or address ranges. If a filter has both global and filter-level exception settings, the TSE uses the filter-level settings to determine how to apply the filter. You can configure the following limits and exceptions from the LSM:

- **Filter Exceptions** (specific) — Allow traffic to pass between specific addresses or address ranges without triggering a filter that would normally be triggered. Configured from the Filter Edit page, these exceptions apply only to the filter that specifies them.
- **Limit Filter to IP Addresses** (global) — Only apply filters to traffic between specified source and destination IP address pairs. You can configure IP address limits that apply to Application Protection, Traffic Normalization, and Network Equipment Protection filter types. You can configure separate limits that apply only to Performance Protection filters.
- **Exceptions** (global) — Exclude traffic between specified source and destination IP address pairs. You can configure exceptions for the following filter types: Application Protection, Traffic Normalization, Network Equipment Protection, and Performance Protection filters.

Adaptive filtering

Adaptive Filtering Configuration (AFC) is a proprietary technology of Trend Micro that preserves device performance when it is experiencing heavy congestion. During such congestion, the IPS engine automatically selects filters that are experiencing an excessive number of triggering events without matching the corresponding filters, or the logic of the filter required to match network traffic is taking an excessive amount of time to complete. Any filters meeting this criteria are disabled. The system log contains a corresponding AFC notification.

You can edit most filters to disable AFC. You can also modify the device-wide adaptive filter configuration for a device.

Learn more about how you can change the adaptive filtering mode.

Best effort mode

Use Best Effort mode to protect latency-sensitive applications. In this mode, packets do not get inspected if the latency introduced by inspecting them exceeds the configured threshold. When the latency reaches the specified threshold, permitted traffic is not inspected until latency falls to the user-defined recovery percentage.

When SSL inspection occurs, the latency measure and relief only apply on inspection and do not apply to the SSL and TCP proxy connections.

To enable Best Effort mode from the CLI, use the **`debug np best-effort`** command.

IPv6 inspection and management

IPv6 traffic inspection, and IPv6 options are available when configuring the Security Profile options. The majority of existing TippingPoint filters are compatible with both IPv4 and IPv6 traffic. You can also configure the host management port, default gateway, and management port routes with IPv6 addresses. Named network support is not available with IPv6 inspection and management.

Tip

Named networks, accessible from the LSM through the **System > Named Networks** page, enables you to assign names to specific IPv4 and IPv6 address prefixes.

Inspection of tunneled traffic

Inspection of tunneled traffic includes the following types of tunneled traffic:

- Generic Routing Encapsulation (GRE)
- GPRS Tunneling Protocol (GTP)
- Mobile IPv4 (IP-in-IP)
- IPv6, including 6-in-4, 4-in-6, and 6-in-6
- Tunnels up to 10 layers or a header size of 256 bytes

Additional event information

The TPS can collect a client's true IP address before a forwarding proxy IP address overwrites it. X-Forwarded-For and True-Client-IP technologies identify a request's source IP address without administrators having to refer to proxy logs or Web server logs.

You can also configure the TPS to display HTTP context information, including the requester's URI, method, and hostname.

When you turn on the Additional Event Information options in the SMS, additional fields in the event logs display the True-Client-IP address and any HTTP URI information associated with the event. This visibility lets security teams set a more accurate network-based user policy.

Working with features specific to TPS devices

Security features described in this topic are supported (as indicated) by some or all of the following TPS devices:

- Virtual Threat Protection System (vTPS) virtual appliance
- 440T device
- 2200T device
- 1100TX device
- 5500TX device
- 8200TX device
- 8400TX device

Jumbo frame support

The TippingPoint Operating System (TOS) supports inspection of jumbo frames up to 9050 bytes. This includes the 14-byte Ethernet header, 9032 bytes of payload data, and the 4-byte Ethernet checksum.

Device support: 440T, 2200T, 1100TX, 5500TX, 8200TX, and 8400TX

Note

This feature is not supported on vTPS virtual appliance.

SSL inspection

SSL inspection provides in-line, real-time threat protection for inbound IPv4 traffic that is SSL encrypted.

SSL inspection is licensed separately. *Learn more* about license updates for SSL.

Device support: vTPS virtual appliance (Performance mode only), 2200T, 5500TX, 8200TX, and 8400TX

To learn more about SSL inspection, refer to the *SMS User Guide*.

License updates

Install your license package on the device to provide the following product capabilities:

- Inspection throughput
- Digital Vaccine
- ThreatDV
- SSL inspection

Not all product capabilities are supported on all TPS devices.

Verify your product license provides sufficient inspection throughput. By default, a TPS security device is unlicensed and provides reduced inspection throughput for testing and evaluation purposes only.

Security device	Unlicensed inspection throughput
vTPS	100 Mbps
440T	100 Mbps
2200T	200 Mbps
1100TX	100 Mbps
5500TX	100 Mbps
8200TX	1 Gbps
8400TX	1 Gbps

Learn more about updating the license package.

Device support: vTPS virtual appliance, 440T, 2200T, 1100TX, 5500TX, 8200TX, and 8400TX devices

VLAN translation

VLAN translation enables the TPS to selectively inspect traffic based on the configuration of the aggregation or distribution switch. This feature translates traffic between different VLANs or between VLAN and non-VLAN interfaces.

Device support: 440T, 2200T, 1100TX, 5500TX, 8200TX, and 8400TX devices

Note

This feature cannot be enabled on vTPS virtual appliances.

Learn more about VLAN translation.

Inspection bypass rules

Inspection bypass rules describe traffic to be directed through the TPS device without inspection. You can apply these rules to traffic according to source or destination IP address, port, or CIDR (Classless Inter-Domain Routing), or to traffic moving through specific ports.

Device support: 440T, 2200T, 1100TX, 5500TX, 8200TX, and 8400TX devices

Note

This feature is not supported on vTPS virtual appliances.

Learn more about inspection bypass rules.

sFlow® record emission

The NX-Platform devices and TPS devices use sFlow record emission to sample a random flow of traffic and send the data to a collector server for analysis. The analysis gives security teams a more holistic view of traffic patterns, which enables early detection and remediation of anomalous or malicious flows.

With sFlow sampling, network and security administrators establish a baseline of typical application traffic to identify unusual patterns. Users specify the following information:

- The IP address of the collection repository. Two collector IP addresses (either IPv4 or IPv6) are supported for IPS devices with TOS v3.6.0 and later installed, and for TPS devices with TOS v5.0.0 and later installed.
- The network segments that have this feature enabled. Although you can enable or disable sampling globally, you still must configure the rate on a per-segment basis.
- The sample rate. Configure this rate at the segment level. Faster links enable larger sample rates.

Tip

Segments for NX-Platform and TX Series devices are on the I/O modules. When you remove a module from a slot, the module's segment configuration and the availability state of its ports remain unchanged. For this reason, consider disabling sFlow on the module's segment port before removing the module. This prevents the device from sending extraneous port statistics counters to any configured sFlow collectors.

The data that is sampled is sent as an sFlow datagram packet to the collector server where analysis occurs. You can then generate reports, including comparison charts, that provide visibility of network congestion and potential security incidents, thereby enhancing the scalability of the network. The SMS can perform data analysis using the SMS Collector.

Note

The option for sFlow sampling is supported on NX-Platform devices and TPS devices only. *Learn more* about configuring sFlow on segments and *learn more* about configuring an sFlow collector.

Device support: NX-Platform devices and all TPS devices

Note

This feature is not supported on vTPS virtual appliances.

Provider Backbone Bridging (MAC-in-MAC) support

Some TippingPoint TX Series devices protect your MAC-in-MAC encapsulated traffic that follows the IEEE 802.1ah standard. Consider these points:

- Network protection is limited to the least significant 20 bits of the 24-bit service identifier (I-SID). The TPS cannot effectively inspect MAC-in-MAC traffic if your network uses the most significant four bits in the I-SID to form different MAC-in-MAC provider domains.
- You can verify the device recognizes MAC-in-MAC traffic by running the `debug np stats show npParseStatsInst` CLI command on the device or by taking a packet capture. When you configure the packet capture, specify a TCPDump expression that identifies the Backbone MAC address (B-MAC) or Backbone VLAN identifier (B-VID) of the traffic you want, or capture all packets for a particular segment.

Device support: 8200TX and 8400TX devices

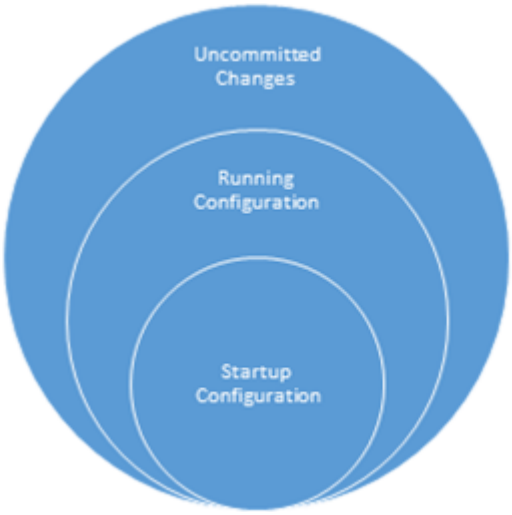
Changing configurations

The *Start configuration* determines the last known configuration of the device and is automatically applied when you reboot the device.

The *Running configuration* is the Start Configuration plus any committed changes from all users of the device since the last reboot. When you log in to the LSM, it loads the Running configuration. When users commit

their configuration changes, or when changes are committed automatically, the changes are committed to the Running configuration only, and the changes are visible to all users.

However, when the device reboots, the Running configuration is reset to the Start configuration. Uncommitted changes and committed changes in the Running configuration are lost.



If you want to persist your Running configuration changes across reboots, you must copy the Running configuration to the Start configuration.

- For a running configuration with only committed changes, select **Configuration** > **Copy Running Configuration to Start**.
- For a running configuration with both uncommitted and committed changes, select **Configuration** > **Commit pending changes and copy to Start**.

For your convenience, the LSM displays the pending changes count on the Configuration menu. You lose any pending changes that are saved but not committed when you exit the LSM. Commit changes to inspection profiles using either the LSM or the SMS.

Deferred commit

You can use a deferred commit if you do not want any of your changes to apply immediately to your current configuration. You defer these changes (place them into a pending state) until you explicitly commit them. Each time you open the LSM, a copy of the configuration is created.

Note

If no changes are pending in the LSM, any deferred commit changes made by the SMS or CLI are displayed when you manually refresh the screen or navigate to a different screen.

Perform the following sequence to ensure that a configuration is active:

1. Make changes to your configuration.
2. Commit the changes to the currently active session.
3. (Optional) Copy the changes to the Start Configuration to persist them after the active session closes.

Deferring changes enables you to make and test changes before they become permanent. This way you can back out of or recover from any unexpected results of a configuration change. It also prevents a partial

configuration. For example, if you create a new Zone, you must also create a new policy for that Zone or modify an existing policy to protect it. With deferred commits, you can complete each of the associated tasks and then commit the changes at one time.

View and discard Pending changes

Uncommitted changes are placed into a Pending state until you explicitly commit them to the Running configuration. If you log out of the LSM without committing your Pending changes, you lose those changes.

Dashboard

To quickly assess policy and system performance, first view the Dashboard. This page is displayed each time you log in to the LSM.

For example, the Health panel includes color health indicators for various components that you can use to get the current state of each component's performance:

- **Green** — No problems
- **Yellow** — Major warning
- **Red** — Critical warning
- **Grey** — Service is disabled

Click Major and Critical warning indicators to view the error that caused the condition. When you view the error, the indicator is reset and its color changes back to green.

For detailed information about each of the health indicators, click on the corresponding links or navigate to the item using the **Monitor** menu.

You can access the Dashboard at any time by clicking the **Home** icon on the left side of the menu bar.

Monitor the device

Monitor logs, sessions, health, and network status using the Monitor menu. It provides administrative control of user sessions, to view or clear all or specific sessions. The XML-based APIs provided at the back end retrieve all the data for all the sessions.

You can initiate some monitor requests by specifying attributes such as IP addresses, family, port numbers, or protocol. Other requests do not require specifying any attributes.

The columns in the table vary according to the type of report. You can click a heading to sort the table by the column. You can cycle through two sort orders by clicking the column heading: ascending (down arrow) and descending (up arrow). You can click on the **Columns** list to check or uncheck the rows to be included or excluded in the table menu.

Monitor logs

In addition to viewing logs, you can also search for logs, sort logs by the newest or oldest entry, download a local copy, and clear log entries.

Use the Monitor menu for surveillance of the following logs:

- *Audit logs*
- *System logs*
- *IPS Block and Alert logs*
- *Quarantine logs*
- *Reputation Block and Alert logs*
- *SSL inspection logs*

For the logs that have them, the severity states are as follows:

- 4: Critical
- 3: Major
- 2: Minor
- 1: Low

When the log is downloaded, the severity is indicated with a number.

Audit logs

The Audit log tracks user activity that might have security implications, including user attempts (successful and unsuccessful), to do the following:

- Change user information
- Change routing or network configuration
- Gain access to controlled areas (including the audit log)
- Update system software and attack protection filter packages
- Change filter settings

When the audit log data threshold reaches 75%, an alert is generated (not configurable). To maintain a complete history of entries and provide a backup, you can configure the device to send log entries to a remote syslog server from the **System > Log Configuration > Notification Contacts** page.

Note

Users must have at least Administrator access level to view, print, reset, and download the Audit log.

The Audit Logs table includes the following information:

Column	Description
User	Displays the login name of the user who performed the audited action. The user listed for an event can include SMS, SYS, and CLI.
Access	Displays the access level of the user performing the action.
IP Address	Displays the IP address from which the user performed the action.
Interface	Displays the interface with which the user logged in: WEB for the LSM, CLI for the command line interface. For system-initiated actions, SYS is displayed in this field.
Component	Displays the area in which the user performed an action (LOGIN, LOGOUT, and Launch Bar Tabs).

Column	Description
Result	Displays the action performed or the result of a LOGIN or LOGOUT attempt.
Action	The action performed as a result. For example, Log Files Reset.

System logs

The System Log contains information about the software processes that control the device, including startup routines, run levels, and maintenance routines. System log entries can provide useful troubleshooting information if you encounter problems with your device.

To maintain a complete history of entries and provide a backup, you can configure the device to send log entries to a remote syslog server from the **System > Log Configuration > Notification Contacts** page.

Note

Users with any access level can view and print the system log, but only Administrator and SuperUser level users can reset this log. System log entries are sent to the syslog server only after the device has fully booted. During the boot sequence, entries cannot be sent because network ports are not yet enabled. When the boot sequence completes, the device sends a startup message to the syslog server.

The System Logs table includes the following information:

Column	Description
Severity Level	Indicates whether the log entry is informational (INFO) or whether it indicates an error or critical condition (ERR or CRIT).
Component	Indicates which software component sent the message to the log.
Message	Text of the log entry.

IPS Block and Alert logs

Consult the IPS Block and Alert logs for information on the network traffic that triggered IPS filters according to the action set created by the user.

Alert logs include the following action sets:

- Permit + Notify
- Permit + Notify + Trace
- Trust + Notify
- Rate Limit + Notify

Block logs include the following action sets:

- Block + Notify
- Block + Notify + Trace

The logs contain IP and Layer 4 information, along with the matching filter.

To maintain a complete history of entries and provide a backup, you can configure the device to send log entries to a remote syslog server from the **System > Log Configuration > Notification Contacts** page.

Note

Any user can view the log, but only administrator and SuperUser level users can reset the log.

The IPS Logs tables include the following information:

Column	Description
Action	Indicates the action that triggered the alert.
Filter Name	Displays the name of the filter that was matched.
Rate Limit	(Alert Log only) Displays the rate limit. If applicable, the log displays the rate limiter rate that was defined in the triggered action set. The log also displays a link to the action set on which the log entry was generated. This field is blank for Permit and Trust action log entries.
Protocol	Displays the name of the protocol that the action affects.
Interface In	Displays the network interface on which the traffic arrived.
Src Addr	Displays the source address of the triggering traffic.
Src Port	Displays the source port number of the triggering traffic.
Interface Out	Displays the network interface from which the triggering traffic departed.
Dst Addr	Displays the destination address of the triggering traffic.
Dst Port	Displays the destination port number of the triggering traffic.
Virtual Segment	Displays the virtual segment on which the alert or block occurred (such as 1A-1B).
VLAN ID	Displays the identification number of the VLAN.
Client IP	Displays the True-Client-IP address. Client IP (X-Forwarded-For & True-Client-IP) feature must be enabled.
URI	Displays the HTTP URI. HTTP Context (Hostname, URI, method) feature must be enabled.
Method	Displays the HTTP method to be performed on the identified resource. HTTP Context (Hostname, URI, method) feature must be enabled. The following methods are supported: GET, PUT, POST, HEAD, DELETE, OPTIONS, TRACE, and CONNECT.
Hostname	Distinguishes between various DNS names that share an IP address. HTTP Context (Hostname, URI, method) feature must be enabled.
Hit Count	Displays the number of packets that have been detected if packet tracing is enabled.
Packet Trace	Indicates whether packet tracing is enabled.

Quarantine logs

The Quarantine log records the IP addresses that have been added to and removed from quarantine. Quarantine logging operates independently of a policy's notification contacts. Quarantine events are always recorded in a log file and on the remote syslog server if configured to do so.

Note

Any user can view the log, but only administrator and SuperUser level users can reset the log.

The Quarantine Logs table includes the following information:

Column	Description
Interface In	Displays the network interface on which the traffic arrived.
Src Addr	Displays the source address of the triggering traffic.
Action	Indicates whether the IP address was added or removed to the Quarantine logs.
Filter Name	Displays the name of the filter that was matched.

Reputation Block and Alert logs

The Reputation log contains log messages for the network traffic that triggers a reputation filter configured with the action set created by the user. Alert messages are displayed for network traffic that triggered a reputation filter configured with the Permit + Notify action set. Block messages are displayed for network traffic that triggered a reputation filter configured with the Block + Notify action set.

The Reputation Logs tables include the following information:

Column	Description
Action	Indicates whether the IP address was added or removed to the reputation logs.
Filter Name	Displays the name of the filter that was matched.
Rate Limit	(Alert Log only) Displays the rate limit. If applicable, the log displays the rate limiter rate that was defined in the triggered action set. The log also displays a link to the action set on which the log entry was generated. This field is blank for Permit and Trust action log entries.
Protocol	Displays the name of the protocol that the action affects.
Interface In	Displays the network interface on which the traffic arrived.
Src Addr	Displays the source address of the triggering traffic.
Src Port	Displays the source port number of the triggering traffic.
Interface Out	Displays the network interface from which the triggering traffic departed.
Dst Addr	Displays the destination address of the triggering traffic.
Dst Port	Displays the destination port number of the triggering traffic.
Virtual Segment	Displays the virtual segment on which the alert or block occurred (such as 1A-1B).
VLAN ID	Displays the identification number of the VLAN.
Hit Count	Displays the number of packets that have been detected if packet trace is enabled.
Packet Trace	Indicates whether packet tracing is enabled.

SSL inspection logs

The SSL Inspection Log records information about SSL sessions. For details, such as connection resets, select **Columns > Details**.

Monitor user sessions

To view all the currently logged users, locked users, and user IP addresses, select **Monitor > Sessions > Users**. If the number of login attempts from a specific user or the IP address exceeds the maximum login attempts, the system locks out the user or IP address.

- To view all the currently logged users, select **Monitor** > **Users > Active Users**.

  Note

  Multiple LSM user sessions from the same IP address are not tracked if a user logs in several times from the same IP address.

- To view all the users who are currently locked out, select **Monitor** > **Users > Locked Users / IP Addresses**. To unlock the user, select the checkbox next to the Username or IP Address and click **Unlock**.

Monitor managed streams

From the Monitor menu, you can also monitor security events. These pages provide visibility into inspection results and traffic flows, including the following sessions:

- *Blocked streams*
- *Rate-limited streams*
- *Quarantined addresses*
- *Trusted streams*

Blocked streams

When traffic triggers a filter that has been configured with a Block or Block + Notify action, traffic from the source IP address and port is blocked and an entry is added to the Blocked Streams table, based on the contact configuration in the action set. Only the IPS blocks and IP reputation (not DNS) can create a block entry.

From the Blocked Streams page, you can:

- View and search for information on blocked streams
- Manually clear all or selected blocked stream connections

The Blocked Streams table displays up to 50 entries. Entries are added when the block event occurs. Entries are automatically removed when the connection times out based on the **Connection Table** timeout setting configured from the **Policy > Profiles > Settings** page. You can manually remove an entry from the table with the Flush function, which unblocks the stream.

View blocked streams

Procedure

1. Select **Monitor > Blocked Streams**.
2. To block the stream, select the checkbox next to the stream and click **Flush Selected** or **Flush All**. On the confirmation dialog, click **OK**.

   To quickly locate a specific blocked stream, use the search panel on the upper-right of the page.

Rate-limited streams

When traffic triggers a filter configured with a rate-limit action set, traffic from the source IP and port is limited based on the rate-limit settings. Traffic from the source IP address and port to the destination IP

address and port remains rate-limited until the connection time-out period expires, or until the connection is manually terminated.

From the Rate Limited Streams page, you can:

- View and search for information on rate-limited streams
- Manually terminate all or selected rate-limited stream connections

The Rate Limited Streams table displays up to 50 entries. Entries are added when the rate-limit event occurs. Entries are automatically removed when the connection times out based on the **Connection Table** setting configured from the **Policy > Profiles > Settings** page. You can manually remove an entry with the **Flush** functions, which removes the rate limit from the stream.

View rate-limited streams

Procedure

1. Select **Monitor > Rate Limited Streams**.
2. To rate-limit the stream, select the checkbox next to the stream and click **Flush Selected** or **Flush All**. On the confirmation dialog, click **OK**.

Quarantined addresses

When traffic triggers a filter that has been configured with a quarantine action, the host is quarantined and an entry is added to the Quarantined Addresses table, based on the contact configuration in the action set. From the Quarantined Addresses page, you can:

- Manually force an address into quarantine
- Search for quarantined addresses
- Manually release all or selected quarantined hosts

The Quarantined Addresses table displays up to 50 entries, including for each entry the IP/source addresses, network destination, and reason for the quarantine.

Manually force an IP address into quarantine

Procedure

1. Enter the IP address in the IP Address to Quarantine field.
2. Select the action set from the Action list.
3. Click **Quarantine** to add the IP address to the quarantined addresses table.

   To search for a specific IP address:

   - Enter the IP address in the Search IP Address field.
   - Click **Go** to view the generated report or **Clear** to clear the search panel.

Trusted streams

When traffic triggers a filter configured with a Trust action set, traffic from the source IP and port is recorded in the Trusted Streams table. From the Trusted Streams page, you can:

- View and search for information on trusted streams
- Manually clear all or selected trusted stream connections

The Trusted Streams table displays up to 50 entries, including for each entry the source/destination of addresses, ports, and interfaces, as well as the reason for the stream being trusted.

Entries are added when the trust action occurs. Entries are automatically removed when the connection times out based on the **Trusted Streams** flush setting configured from the **Policy > Profiles > Settings** page. You can manually remove an entry with the **Flush** functions, which removes the trusted stream from the table.

Monitor health

Monitor the current status and network performance of the device. With convenient access to key network and device metrics, you can quickly detect and resolve the device malfunctions and bottlenecks in the network. These health statistics indicate the state of the system and its various components—such as fan, disk, and CPU—to help you maintain optimal performance and continued operation of the device.

Segments on the Performance page are grouped according to module on the TPS TX Series devices. Each module occupies a Slot, which appears as a subsection of the Performance table. The table displays both aggregate performance statistics and statistics broken down by segment. Use the following table when assessing the performance of components on the Performance page:

Column	Description

Component	Congestion, performance, or port being monitored:
	• Congestion – Indicates the traffic congestion impact on the engine.
	  • Green – Engine usage below 10%. This reflects a normal operating state.
	  Note
	  Usage could be below 10% and still show a yellow Warning state depending on the Performance Protection values set.
	  • Yellow – Engine usage between 10% – 25%. This warns that congestion is causing a higher than normal strain on the engine.
	  • Red – Engine usage above 25%. The strain of traffic congestion on the engine has reached a critical level.
	• Performance – Indicates the total and used bandwidth of the device. A yellow Warning state indicates that Performance Protection has been triggered based on user-configured settings. Configure Performance Protection on the **System > Log Configuration > Performance Protection** page.
	• Ports – Indicates the port bandwidth used.

Description	Describes the component.

Column	Description
State	The current performance status of the device or the operating status of each port. • **Normal** — Green. Device performance is normal. The port is active without errors. • **Warning** — Yellow. Performance loss or congestion has put undue stress on the engine or has triggered Performance Protection mode. • **Critical** — Red. The port is waiting for traffic or usage in a stand-by mode, or the device has entered Layer 2 Fallback because of Performance Protection. • **Inactive** — Grey. The port is not in use or is disabled.

Throughput	A bar graph depicting the performance of the device and current usage level of the ports.
	• **Performance** – Indicates the total and used bandwidth of the device. The color of the bar changes according to the status of Performance Protection.
	• *<Port name>*
	  • Green – Less than 80% of port bandwidth used.
	  • Yellow – Between 80% and 99% of port bandwidth used.
	  • Red – Over 99% of port bandwidth used.

Details	Percentage of throughput used.

The HA page displays identifying information for your device and its HA partner device. The State Synchronization table displays each subsystem and its current state. You can force a subsystem state resync by selecting the check box next to the **Subsystem** and clicking **Force State Re-Sync**.

The High Availability page lists the current high availability status for the following High Availability features:

- Intrinsic Network High Availability
- Transparent High Availability

Learn more about configuring HA.

Monitor network

Use the Monitor menu to survey network performance, such as bandwidth and traffic (in bps) activity of the ports.

Ports refer to the physical ports on the device such as 1A, 1B, and so on. On TX Series devices, ports are grouped by module. Each module occupies a slot, and the number of the slot is reflected in the port name. For example, port 3A in the module inserted in slot 2 would be listed as 2-3A. The available trend intervals are 24 hours, seven days, and 30 days.

Network

To view and modify the setup of the device so that it can work within your network environment, use the **Network** menu pages. The following menu options are available:

- *Ports*— Disable, enable, or restart a network port, and manage network port configuration (auto-negotiation and line speed).
- *Network segments*— View and manage network segment configuration for Intrinsic High Availability (Intrinsic HA), Link Down Synchronization (LDS), and sFlow® sampling.

- *Virtual segments*— Create and manage virtual segments to further refine the network traffic classifications.
- *VLAN translation* — Enable translation of traffic between different VLANs or between VLAN and non-VLAN interfaces.
- *DNS*— Specify domain names and IPv4 or IPv6 server addresses.

Configuring network ports

Use the Ports pages to perform the following tasks:

- View a list of network I/O modules and their ports
- View and edit current network port configuration
- Disable/enable Auto Negotiation
- Disable/enable network ports
- Restart the interface on a network port

By default, the device sets all network ports to auto-negotiate. With this setting, the port negotiates the highest line speed supported by both the network port and its link partner. To reliably establish and maintain links, configure both the device ports and the link partners to auto-negotiate. However, if the device cannot establish or maintain a link when auto-negotiate is set, you might need to disable auto-negotiation and configure the line speed and duplex settings. You might want to disable auto-negotiation on some older networks if the device is unable to establish or sustain the link with its partner.

Note

When you disable auto-negotiation, some port options might be limited. For example, 1000 Mbps line speed is only available for copper ports when you enable auto-negotiation. When you disable auto-negotiation, the line speed can only be set to 100 Mbps or 10 Mbps.

When configuring the ports, remember that both link partners must be configured with identical settings. If you configure one port to auto-negotiate, you must also configure the other port to auto-negotiate. If you only configure one port to auto-negotiate, the link might come up, but one or both partners can experience poor performance or RX errors.

Network ports – TX Series

TX Series devices reference port names by I/O slot. Each I/O module occupies a slot, so the number of the slot is prepended to the port name. For example, port 3A of the network I/O module in slot 2 is port 2-3A. You cannot rename network ports.

The Ports page for TX Series devices includes I/O module information for each I/O slot.

Column	Description
Slot	Identifies the slot number: • On 1100TX, 5500TX, and 8200TX devices – Slot 1 is on the left and Slot 2 is on the right. • On 8400TX devices – On the bottom row, Slot 1 is on the left and Slot 2 is on the right. On the top row, Slot 3 is on the left and Slot 4 is on the right.
Status	Indicates whether a slot is empty, active, or experiencing an error.

Column	Description
Clear Configuration	Clears the existing configuration on the slot if the slot is empty.
Module Type	The type of module currently occupying the slot: • TippingPoint 6-Segment Gig-T module • TippingPoint 6-Segment GbE SFP module • TippingPoint 4-Segment 10 GbE SFP+ module • TippingPoint 1-Segment 40 GbE QSPF+ module • TippingPoint 4-Segment Gig-T Bypass module • TippingPoint 2-Segment 1 G Fiber SR Bypass module • TippingPoint 2-Segment 1 G Fiber LR Bypass module • TippingPoint 2-Segment 10 G Fiber SR Bypass module • TippingPoint 2-Segment 10 G Fiber LR Bypass module • TippingPoint 1-Segment 40 G Fiber SR4 Bypass module • TippingPoint 1-Segment 40 G Fiber LR4 Bypass module **Note** The second slot of a 5500TX device supports only the first four segments of a 6-segment I/O module. If no module is inserted, the field is described as Empty.

Note

Fiber modules support transceivers of two types:

- Short range (SR) or multi-mode
- Long range (LR) or single-mode

Always use the correct transceivers and cabling with fiber modules. The transceivers on both ends must match, and the fiber cabling much also match with the transceiver type. A multi-mode cable is typically orange/aqua and will be labeled with 50 micron on it. A single-mode cable is typically yellow and will be labeled with 9 micron on it. SR transceivers must be connected with multi-mode cabling, and LR transceivers must be connected with single-mode cabling.

Bypass modules have built-in transceivers. Make sure the bypass module type matches the cabling (the bypass modules have both SR and LR variants).

Important considerations when editing port settings

Select **Network > Ports > Settings** to edit the physical characteristics of the network port settings on each network segment of your TPS device.

When making your configuration changes, note the following constraints:

- On a vTPS virtual appliance, you cannot edit the physical characteristics of a port (such as speed and duplex) because a port is virtual instead of physical (such as copper or fiber). If you want to disable a port on a vTPS virtual appliance, the best way is to connect to an empty virtual switch.

- Remember that both link partners must be configured with identical settings. If one port is configured to auto-negotiate, the other port must also be configured to auto-negotiate. If only one port is configured to auto-negotiate, the link might come up, but one or both partners might experience poor performance or RX errors.
- The 10 G Fiber BIOMs have internal dual-rate SFP+ transceivers that can operate at either 10 Gbps (the default) or 1 Gbps speeds.
- Fiber modules do not support auto-negotiation.
- If you use a 1000-BaseT copper SFP in the 6-Segment GbE SFP module, auto-negotiation will be available at 1000 Mbps.
- 10 GbE SFP+ modules support both SFP and SFP+ transceivers. If you plug SFP transceivers into SFP+ ports, only 1 Gbps speed will be available. Both 1 Gbps and 10 Gbps speeds can be configured with a multispeed SFP+ transceiver.
- If you use a copper-fiber translator, disable auto-negotiation on the device before performing a restart. Some translators do not support auto-negotiation. When the copper cable is pulled, these translators do not attempt to auto-negotiate with the device. The device driver attempts to re-initialize the port several times before timing out and placing the port in Disabled mode.
- After making port configuration changes, restart the port to ensure proper functioning of the device. While the interface restarts, network connectivity might be interrupted.

Note

Before you restart the interface, always make sure that the network port is Enabled. If the port is Disabled, the interface cannot be restarted.

Network segments

Create a *network segment* by joining an Ethernet pair of interfaces on the device in a transparent, bump-in-the-wire architecture to enable traffic flow and inspection between the two network ports. You can configure segments between vertical port pairs only; for example, ports 1A and 1B form one segment. These two ports integrate the device into the network.

On each segment, configure the following options:

- Intrinsic HA (vTPS virtual appliance and TPS devices) – Set the Layer-2 Fallback action so that if the device enters Layer-2 Fallback, the segment permits uninspected traffic to flow or the segment blocks all traffic. *Learn more* about considerations for setting HA.
- Link Down Synchronization (TPS only) – Set a Link Down Synchronization option so that if a port link failure occurs, the same **Link Down** state is synchronized to the partner port on the segment. *Learn more* about considerations for setting Link Down Synchronization.
- sFlow® sampling (TPS devices only) – Enables you to configure options so that segment traffic is randomly sampled for analysis on a collector server. Sampling on segments is disabled by default. Specify a sample to be taken once every 1 to 1,000,000 packets. The default sample rate is once every 1,000 packets. You must configure at least one collector server before sFlow sampling can be enabled on the segment. *Learn more* about considerations for setting sFlow sampling.

Important considerations when editing a segment

Select **Network > Segment** to edit the configuration details for each network segment.

When making your configuration changes, note the following constraints:

- **vTPS constraints**

  On a vTPS virtual appliance, Link Down Synchronization and sFlow sampling are not applicable.

- **sFlow constraints**

  When configuring sFlow, note that faster segment links support higher sample rates. You must configure at least one collector server before sFlow sampling can be enabled on the segment.

- **TX Series constraints**

  TX Series devices identify network segments by I/O slot. Each I/O module occupies a slot, so the number of the slot is prepended to the segment name. For example, the name of segment 1 in slot 2 would be segment 2-1. To extend this example, the port pair for segment 2-1 is port 2-1A and port 2-1B. You cannot rename segments.

  The second slot of the 5500TX device supports only the first four segments of a 6-segment I/O module.

  When you hot swap an I/O module on TX Series devices, the module port configuration is always reset; however, module segment configuration, including Link Down Synchronization, Intrinsic HA, and inspection bypass, is always preserved.

- **Virtual segment option**

  In addition to the physical segments on the device, physical segments also have predefined virtual segments so you can classify and filter traffic on the network by both physical port and VLAN ID.

- **Do not forget to restart!**

  Restart a network segment to enable the port link connections to be re-established. Before you restart a network segment, make sure that the network ports on the segment are Enabled. If a port is Disabled, you cannot restart the interface.

  When you restart a segment, network connectivity might be interrupted on the port pair while each interface is restarted. If necessary, you can restart the interface on a particular port of the segment.

Link Down Synchronization

Set a Link Down Synchronization (LDS) option on each network segment so that if a port link failure occurs, the same **Link Down** state is synchronized to the partner port on the segment. Synchronization of the **Link Down** state assures that the network segment continues to appear as a bump in the wire and does not become a black hole.

Note

Link Down Synchronization does not apply to vTPS virtual appliances. If a port link failure occurs, the device does not synchronize the **Link Down** state to the partner port.

Choose from the following options:

- Hub – This option does not synchronize a port **Link Down** state to the partner port. This is the default.
- Breaker – When either port link in the segment goes down, this option disables the partner port, which forces the interface on the partner port into a **Link Down** state. When the failed port link has been re-established, manually enable the partner port (like a circuit breaker) so that the partner port link can be re-established. *Learn more* about editing port segments.

- Wire – This option disables the partner port the same way as the Breaker option. But, when the device detects that the failed port link has been re-established, the device automatically enables the partner port so that the partner port link can be re-established.

Keep in mind the following:

- You do not need to enable the network port where the initial port link failure occurred. The network port remains enabled so that the link can be re-established automatically.
- Inspection of the network segment resumes only after both ports in the segment have returned to a **Link Up** status. If both ports are Enabled, and a port has a **Link Down** state, restart the interface so that the port link can be re-established.

Note

To restart the interface, the network port must be Enabled. *Learn more* about editing port segments.

- The amount of time that is required to synchronize the **Link Down** state to the partner port varies by device family:
  - On IPS security devices only, there is a 1-second polling interval to check the link status, so an IPS device can take up to 1 second to determine the **Link Down** status of a port. TPS devices detect a change in the link status when it occurs.
  - To minimize port flap, use the Wait Time threshold to specify how long to wait to confirm that a port link is down. You can specify a threshold value from 0–240 seconds. The default value is 1 second.
  - When the device confirms a **Link Down** state, the device begins to disable the partner port. The device typically requires less than 1 second to disable the partner port, which forces the interface on the partner port into a **Link Down** state.

Note

On IPS security devices, with a Wait Time threshold of 0 seconds, it typically takes less than 2 seconds to disable the partner port.

- Use the Audit log to see when a port link failure was initially detected, when the **Link Down** state was confirmed, and when the partner port was disabled. For example, in Breaker mode, a persistent port link failure would generate the following log entries:
  - System Log – example with annotated log entries

```
Severity Level   Component   Message
Warn             MAL         Port 1-1A is now DOWN   <- Inital port link
                             failure was detected (network port remains
                             enabled)
Error            DRV         Link Down Synchronization has detected link
                             down port 1-1A   <- Port link failure confirmed
Warn             MAL         Port 1-1B is now DOWN   <- LDS forced down the
                             partner port link. A similar
Inf              MAL         Port 1-1A is now UP        Audit log entry was
                             created (see below)
```

  - Audit Log – example with annotated log entry

```
Access Level   Interface   Message
Super User     SYS         Link Down Synchronization shutting down port
                           1-1B   <- LDS forced down the partner port link
```

Virtual segments

Physical segments have predefined virtual segments. CIDRs and profiles are applied to the virtual segment. Virtual segments enable further management of VLAN traffic and enable you to classify and filter traffic on the network by both physical port and VLAN ID.

You can configure a maximum of 64 virtual segments.

Virtual segments are saved on the device in a prioritized table, and security profiles and traffic management profiles are applied in order of priority. For example, if port 1A is assigned to two different virtual segments, the profiles that are assigned to the higher-priority segment are applied to the traffic on that port before the profiles assigned to the lower-priority segment. If no physical ports are defined on a virtual segment, the virtual segment will apply to all physical ports.

Note

You can create a "catch all" virtual segment to distribute your own inspection profile and protect network traffic that does not match another inspection profile on the device. When you create a "catch all" virtual segment, be sure to assign all physical segments and to order the virtual segment lowest in priority. The priority order for virtual segments on the TPS is:

1. User-defined virtual segments with a specified VLAN-ID and source/destination IP address.
2. Physical segments (any VLAN)

The Virtual Segment table has the following configuration parameters:

Parameter	Description
Order	The order of priority. Position values must remain contiguous across all defined virtual segments, so there should never be a gap in the sequence.
Name	The name of the virtual segment. Each name must be unique.
VLAN ID	The ID of the incoming VLAN. If no VLAN IDs are defined on a virtual segment, all VLAN IDs are included. Each VLAN ID in a range counts separately. For example, `vlan-id range 1 5` counts as 5 IDs. You can configure up to 4094 VLAN IDs per virtual segment.
Source Address	The source CIDR. If no source addresses are defined, all source addresses are included. Each CIDR counts as a single address. For example, `192.168.1.0/24` counts as 1 address. No more than 512 addresses can be specified.
Destination Address	The destination CIDR. If no destination addresses are defined, all destination addresses are included. Each CIDR counts as a single address. No more than 512 addresses can be specified.
Physical Segments	The physical segment associated with the virtual segment pair. On TX Series devices, physical segments are grouped by module. Each module occupies a slot, and the number of the slot is reflected in the physical segment name. For example, port 3A in the module inserted in slot 2 would be listed as physical segment 2-3A.
IPS Profile	The IPS profile assigned to the virtual segment.
Reputation Profile	The Reputation profile assigned to the virtual segment.
Traffic Management Profile	The Traffic Management profile assigned to the virtual segment.
SSL Profile	The SSL Inspection profile assigned to the virtual segment.

Add, insert, or edit a virtual segment

Click **Add** to add the new virtual segment after all the other user-created virtual segments. Click **Insert** to insert the new virtual segment just before the currently selected virtual segment. Virtual segments that the

system creates can have their profiles modified but are otherwise read-only. All system-created virtual segments are always displayed at the end of the list.

Procedure

1. From the LSM menu, click **Network > Virtual Segments**.
2. Click **Add** or **Insert** to create a new virtual segment, or click **Edit** to edit an existing virtual segment.
3. In the Add Virtual Segment dialog or Edit Virtual Segment dialog, specify the following:
   - Name – (Required) Name used to identify the virtual segment. Each virtual segment must have a unique name.
   - Description – An optional parameter to provide more detailed information about the virtual segment.
   - IPS Profile – Security profile that you want to apply to the virtual segment. A virtual segment can have only one IPS profile applied to it.
   - Reputation Profile – Reputation profile that you want to apply to the virtual segment. A virtual segment can have only one Reputation profile applied to it.
   - Traffic Management Profile – Traffic Management profile that you want to apply to the virtual segment. A virtual segment can have only one Traffic Management profile applied to it.
   - SSL Inspection Profile – SSL inspection profile that you want to apply to the virtual segment. A virtual segment can have only one SSL inspection profile applied to it.
   - Physical Segments – Physical segment associated with the virtual segment. All physical segments are directional.
   - Traffic Criteria – (Required) Specify any one or all of the following: VLAN ID, Source IP, and Destination IP. For example, omit VLAN ID and specify Destination IP. When you specify a VLAN ID, specify a value between 1 and 4094 in which the segment is included. There can be no duplicate VLAN IDs or overlapping VLAN ranges. All 4094 VLAN IDs can be used per virtual segment (a VLAN range of 1–100 counts as 100 IDs). You must define at least one traffic criteria (VLAN ID, source IP address, or destination IP address) for each virtual segment.
   - Source IP Address – Source CIDR associated with the virtual segment. Addresses must be valid and can be IPv4 or IPv6. The host portion of address/mask must be 0 (zero). No more than 250 addresses can be specified.
   - Destination IP Address – Destination CIDR associated with the virtual segment. Addresses must be valid and can be IPv4 or IPv6. The host portion of address/mask must be 0 (zero). No more than 250 addresses can be specified.
4. Click **OK**.

Note

Virtual segments must be created with a physically available segment. If creating a virtual segment generates a UDM warning in the system log, ensure you have associated the virtual segment with a valid physical segment.

Move a virtual segment

Only user-created virtual segments can be moved or deleted.

If you want to move a virtual segment to a specific location and priority, click **Move To**. If you want to reorder the priority of the virtual segment in the list, click **Move Up** or **Move Down**.

DNS service

You can configure the Domain Name Service (DNS) on the device to map domain names with IP addresses. Additionally, you can configure the domain name and domain search paths used by the device to resolve DNS names.

By default, the DNS service uses the Management Port to send DNS request packets.

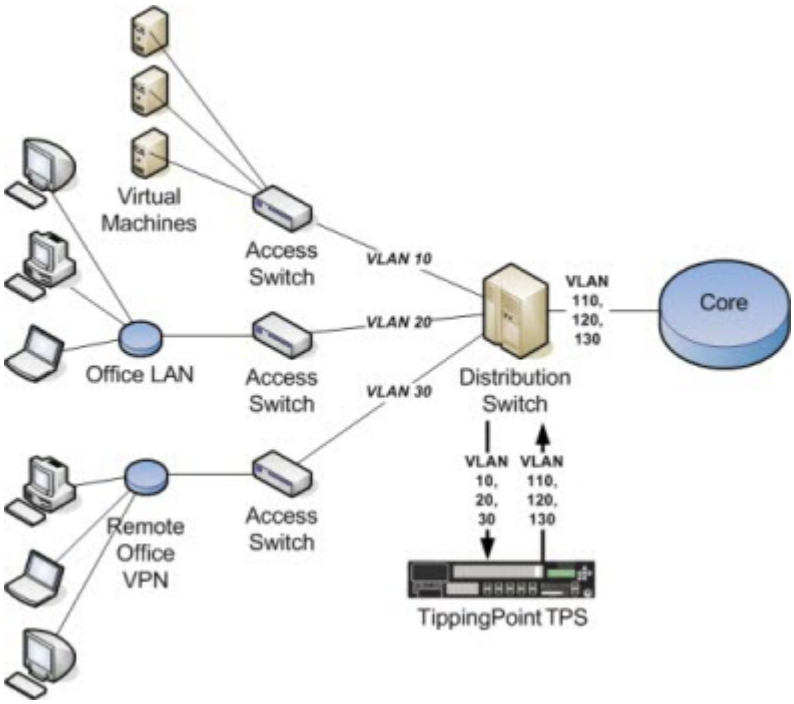
To add domain names and server IP addresses:

1. Select **Network > DNS Service**.
2. Under Domain Names:
   a. Enter a valid **Domain Name**. You can also enter optional domain search names.
   b. In the Server IP Addresses panel, enter up to four IPv4 or IPv6 Server addresses and click **OK**.

VLAN translation

The TPS translates traffic between different VLANs or between VLAN and non-VLAN interfaces. When you deploy the TPS on an aggregation or distribution switch, traffic is selectively inspected based on the switch configuration. You can adjust the switch aggregation to focus inspection capacity on the VLANs where the need is greatest.

The following diagram shows a sample TPS deployment where three VLANs connect to a central distribution switch. The traffic is routed from the switch to the TPS, which inspects the traffic, performs the translation tasks, and routes the inspected traffic back onto the network.



Security policies are applied to the incoming VLAN ID only. VLAN mappings must be unique, with one incoming VLAN paired with one outgoing VLAN. The TPS does not translate one-to-many VLAN mapping. You can reverse VLAN translation on traffic exiting the interface by enabling the **Auto-Reverse** option in the configuration.

The TPS creates a separate VLAN translation rule for each port you want to translate. A maximum of 8000 VLAN translation rules can be defined. If the number of VLAN translation rules you want to commit exceeds the specified limit, the device does not commit your changes.

Note

vTPS virtual appliances do not support VLAN translation.

Configure an sFlow® collector

With sFlow traffic sampling, you can establish a baseline of typical application traffic by sampling and analyzing random flows of traffic. Any anomalous or malicious flows are quickly detected.

To enable sFlow sampling on a random flow of network traffic, you must first configure an sFlow collector server. Use the sFlow Collectors page (**Network > sFlow**) to configure up to two collector servers that receive and analyze sFlow packets.

Procedure

1. From the LSM menu, click **Network > sFlow**.
2. Type an IP address for each collector server. Up to two collector IP addresses (IPv4 or IPv6) are supported.

   The SMS can perform the data analysis with the SMS Collector.
3. Specify the network port as required. The default port is `6343`.
4. Select **Send sFlow data to collectors** (disabled by default).

   This option remains disabled until at least one collector server is configured.
5. Click **OK**.

After an sFlow collector is configured for collection and analysis, you must still configure the sampling rate on a segment-by-segment basis. To do this, click the link at the bottom of the sFlow Collectors page or go to **Network > Segments**. *Learn more* about configuring sFlow sampling on segments.

Manage policies

Policies specify the security features and requirements of your network, such as rules that determine who is allowed to access the network, which applications they can use, and which web sites they can visit. Policies include all of the mechanisms available on the device that protect and manage network traffic, including the different types of profiles and the various objects—such as action sets, notification contacts, and services—that compose them.

Profile configuration

Use the TPS to monitor and configure the settings for the following types of profiles:

- *IPS profiles* – An IPS profile defines the traffic that the device monitors and the Digital Vaccine filters that the device applies. Incoming and outgoing port pairs determine the traffic monitoring. You can use the default Digital Vaccine filter configuration to protect the virtual segment or customize the configuration as required. The virtual segment specifies both the port and the traffic direction, which enables you to define separate security profiles for traffic flowing in and out of a port.
- *Reputation profiles and reputation groups* – A Reputation profile creates a security policy using reputation filters that identify suspect IP addresses, domain names, and URLs. Access to these filters comes from a subscription to the Threat Digital Vaccine (ThreatDV) service. ThreatDV uses an intelligence feed that comes from a multi-vendor, global reputation database. This feed is updated multiple times a day to stay ahead of emerging threats and to reduce your network security risks.
- *Traffic management profiles* – The filters in a Traffic Management profile react to traffic based on a limited set of parameters, including the source IP address, destination IP address, port, protocol, or other defined values. These filters detect issues in bandwidth usage.

IPS profiles

The default IPS profile is set to ANY incoming ports and ANY outgoing ports, with all IPS filters configured with the default Digital Vaccine settings. With the default profile in place, all incoming and outgoing traffic on any virtual segment configured on the device is monitored according to the filter configuration recommended by TippingPoint. You can edit the default IPS profile to modify the filter settings. You can also create your own IPS profiles, and edit the virtual segments to apply your own IPS profile instead of the default.

Note

Before creating IPS profiles, verify that the network and system configuration on the device is set up correctly for your environment. In particular, configure all required ports before creating the security profiles to protect them.

When you initially create an IPS profile, the recommended settings for all filter categories are enabled.

Use the IPS Profiles page to perform the following tasks:

- View, create, edit, and delete IPS profiles
- Change category settings for a group of filters
- Specify source and destination addresses to limit or exclude
- Override global filter settings and create filter-level settings
- Restore filter to global category settings
- Specify Direct Denial-of-Service (DDoS) filters

Learn more about managing virtual segments associated with IPS profiles using the Virtual Segments page.

Default IPS profile

The default IPS profile is set to the ANY< ==> ANY virtual segment with all IPS filters configured with the default Digital Vaccine settings. With the default profile in place, all incoming and outgoing traffic in any virtual segment configured on the device is monitored according to the Digital Vaccine filter configuration recommended by TippingPoint.

You can edit the default security profile to customize the virtual segments that it applies to and create custom filter settings, or create your own security profiles as required.

How IPS profiles get applied to traffic

Depending on how the virtual segments are configured, a packet can match more than one IPS profile.

Each virtual segment composes an ordered list. The TPS device surveys the list beginning at the top and finds the first virtual segment that matches the traffic. The IPS profile associated with that virtual segment will be applied to the traffic.

Sample IPS profiles

The following table shows a sample port configuration:

Name	Network Port	VLAN
any	any	any
segment1 (A > B)	1A > 1B	any
segment2 (A > B)	2A > 2B	any
Marketing-A	1A > 1B	6
Marketing-B	2A > 2B	6

The following table lists some IPS security profiles that you can create to monitor traffic on a device with the configuration shown in the preceding table.

Name	Virtual Segment(s) (Incoming, Outgoing)	Description
Marketing	Marketing-A ==> Marketing-B Marketing-B ==> Marketing-A	Monitor all VLAN 6 traffic on port 1A > 1B and port 2A > 2B in both directions.
LAN	segment1 (A > B) segment1 (B > A)	Monitor all traffic between ports 1A > 1B and 2A > 2B, except traffic tagged for VLAN 6. VLAN 6 traffic is covered by the Marketing security profile above.

Capture additional event information

Some attackers use strategic methods to hide their source information. For example, the IP address of the attacker displayed in the Src Addr field of the Block or Alert IPS Logs can belong to a forwarding proxy server. TPS devices provide the ability to identify the true IP address of an attacker and the HTTP URI and hostname information associated with an event.

Procedure

1. On the LSM menu, click **Policy > IPS Profiles**.
2. Select a profile and click **Edit**.

   The **Edit IPS Profile** dialog is displayed.
3. Under the General tab:
   - Click the **Client IP (X-Forwarded-For & True-Client-IP)** checkbox to see information in the logs that identifies a request's source IP address.
   - Click the **HTTP Context (Hostname, URI, method)** checkbox to see information in the logs that provides HTTP context information, including the requester's URI, method, and hostname.

4. Click **OK**.

To see this additional information in the IPS Block and Alert logs, you must click on the **Columns** pull-down menu on the right of the log page to check or uncheck the additional event information items you want to monitor:

- Client IP
- URI
- Method
- Hostname

The information in these fields lets security teams set a more accurate network-based user policy. Only HTTP traffic that passes through a proxy that is configured to record the source IP address of packets have this information displayed in the logs.

This additional information, if available, will be provided to the Remote System Log so you can maintain a history and backup of the data.

Note

The data collected with this feature is used for logging purposes only. To block the IP address for the profile, you must configure an action set for that packet. *Learn more*.

Reputation profiles and reputation groups

When you subscribe to the TippingPoint Threat Digital Vaccine (ThreatDV) service, your subscription includes reputation filters that you use to create a Reputation profile. Each filter contains a reputation group and an action set.

The TippingPoint Threat DV is a licensed service that identifies and delivers suspect IP addresses, domain names, and URLs to subscribers. The service tags suspicious items with reputation, geographic, and other identifiers for ready and easy security policy creation and management. The service provides the addresses and tags multiple times a day, similar to how a Digital Vaccine gets updated.

While any user can manually create reputation groups and filters, only users with a license for the service can use Threat DV. For more information about this service, ask your TippingPoint representative.

Tip

When specifying an action set for a reputation profile, add quarantine exceptions for hosts that you never want to quarantine, such as the Default Gateway and DNS Server. For example, when a DNS server receives a request from a client and it does not know the answer, it forwards the request to another authoritative DNS server. To the IPS, the DNS Server might look like an infected host making a DNS request.

Learn more about reputation groups.

Traffic management profiles

Use the Traffic Management Profiles page (**Policy > Profiles > Traffic Management**) to view, create, edit, or delete a traffic management profile and apply traffic management profiles to virtual segments. The Traffic Management Profiles page lists all the traffic management profiles currently configured on the device.

A traffic management profile consists of the following components:

- **Profile Details** — Profile name and description.
- **Traffic Filters** — One or more filters to manage the traffic based on Protocol or IP address and port. Each filter defines the type of traffic to be monitored and the action to be taken when there is a filter match.

Traffic that triggers the traffic management filter is managed based on the filter action configured, which can be any of the following:

- **Block** — Denies traffic that meets the filter criteria.
- **Allow** — Allows traffic that meets the filter criteria.
- **Rate Limit** — Rate limits traffic that meets the filter criteria.
- **Trust** — Allows traffic that meets the filter criteria through the device without being inspected.

Traffic that is allowed or rate-limited based on a traffic management filter goes on to be inspected based on the security profile configuration (Digital Vaccine filtering). In other words, traffic is not allowed through the device based solely on the traffic management filter criteria, unless the filter is configured with the Trust action.

Note

Quarantine actions take priority over traffic management trust filters.

During profile configuration, specifying an IPv4-mapped address in IPv6 notation for the version will only match addresses that actually appear in IPv6 packets on the wire. They will not match IPv4 packets. Similarly, a range entered in IPv4 notation will only match IPv4 packets, and not IPv6 packets that contain the equivalent IPv4-mapped addresses.

Learn more about managing virtual segments associated with security profiles using the Virtual Segments page.

Sample traffic management profile

You can use traffic management filters to prioritize traffic or implement security policy. For example, you might define the following IP filters for your web servers in a lab that denies access to external users:

- Block traffic if the source is on an external subnet that arrives through port 80 and is destined for the IP address of your web server.
- Block traffic if the source is your web server, the source port is 80, and the destination is any external subnet.

You can define multiple traffic management rules in each profile. In general, when you define filters for network segments, more specific filters should come first. For example, a more specific IP filter might block traffic with fully qualified source and destination IP addresses and ports. More general ones, like those that apply to subnets, should follow.

The following table lists several examples of traffic management filters:

Source address	Destination address	Protocol	Source port	Destination port	Action
any	any	UDP	any	53	Allow
any	any	UDP	any	any	Block

Source address	Destination address	Protocol	Source port	Destination port	Action
any	any	ICMP	any	any	20 Mbps rate-limit
any	1.2.3.4	TCP	any	80	Allow
any	any	TCP	any	80	Block
66.94.234.13	any	IP	any	80	Block

These filters perform the following actions:

- Block all UDP traffic except DNS requests. DNS requests are inspected for attacks.
- Limit all ICMP traffic to 20 Mbps.
- Block all HTTP traffic except for server 1.2.3.4.
- Block IP fragments coming from IP address 66.94.234.13 on any port going to port 80.

Inspection bypass rules

You can configure inspection bypass rules with TippingPoint TPS devices. Traffic that matches inspection bypass rules is directed through the IPS without inspection. You can apply these rules to traffic according to source or destination IP address, port, or CIDR (Classless Inter-Domain Routing). You can also apply the rules to traffic moving through specific ports.

Define up to 32 inspection bypass rules on a TippingPoint TPS device. Rule configurations that bypass traffic or VLAN ranges require additional hardware resources. For example, a single inspection bypass rule for VLAN traffic can result in multiple port-VLAN rule combinations.

Inspection bypass rule (for a single port)	Resulting number of port-VLAN rule combinations
IPv4/IPv6 traffic on TCP 1556 with untagged traffic or a particular VLAN ID	1
IPv4/IPv6 traffic on TCP 1556 with VLAN 10 – 100	91

Each TPS supports a maximum number of port-VLAN rule combinations. If the number of configured port-VLAN rule combinations exceeds the maximum threshold for the device, you cannot commit the changes.

For a	Maximum (approximate) number of port-VLAN rule combinations when bypassing IPv4 traffic	Maximum (approximate) number of port-VLAN rule combinations when bypassing IPv6 traffic
440T device	256	128
2200T device	2560	1280
1100TX	448	256
5500TX	1792	1024
8200TX/8400TX device	512	512

From the list of inspection bypass rules, you can reset the **Packet Hit Count** for a particular rule by selecting the rule and clicking **Reset Counts**. To refresh the entire list, click **Refresh** at the top of the page.

Add or edit an inspection bypass rule

Add or edit an inspection bypass rule to enable or disable the rule and to specify the traffic that you do *not* want to inspect.

You can also define Inspection bypass rules with the **`inspection-bypass`** context in the CLI. Refer to the *Threat Protection System Command Line Interface Reference* for more information.

Procedure

1. Select **Policy > Inspection Bypass**.
2. In the Inspection Bypass Rules panel, click **Add** or **Edit** and specify the following settings.
   - **Name –** Specify the name of the inspection bypass rule.
   - **Enabled –** Select this option to enable the inspection bypass rule. This option is enabled by default.
   - **Ethernet Type** – Choose an option to specify the **EtherType** or choose **Custom** to specify the hexadecimal value of the **EtherType** to bypass. When specifying a hexadecimal value, prepend the value with `0x`, for example, `0x0806` for ARP. By default, IP is selected.

     Note

     You can see a full list of EtherType values at the Internet Assigned Numbers Authority website.

   - **IP Protocol** – Choose an option to specify the IP protocol or choose Custom to specify the IP protocol value to bypass.

     Note

     You can see a full list of IP protocol values at the Internet Assigned Numbers Authority website.

   - **Source address and ports** – Specify the source IP address and port range to bypass.
   - **Destination address** – Specify the destination IP address and port range to bypass.
   - **Action** – Specify which action the rule applies to the traffic.
     - **Bypass (default)** – Bypasses the traffic.
     - **Block** – Blocks the traffic.
     - **Redirect** – Redirects the traffic. An **Action Target Port** field (required) is displayed for you to specify which segment port the traffic gets redirected to. This option is unselectable if no target port is available.
     - **Ingress mirror** – Mirrors (copies) the traffic that enters the selected inbound segment port to a target port before the traffic gets inspected. A **Target Port** field (required) is displayed for you to specify which segment port the uninspected traffic gets mirrored to. Four mirror-to-port (MTP) configurations are supported. This option is unselectable if no target port is available.
     - **Egress mirror** – Mirrors (copies) the traffic that enters the selected inbound segment port to a target port after the traffic gets inspected. A **Target Port** field (required) is displayed for you to specify which segment port the inspected traffic gets mirrored to. Four MTP configurations are supported. The port-assigned VLAN is recorded inside the captured packet. This option is unselectable if no target port is available.
   - **VLAN** – Choose an option to specify the VLAN traffic to bypass.

- **ID or Range** – Use this option to specify the tagged traffic you do not want to inspect. For example, specify 12-15 to not inspect tagged traffic on VLANs 12 to 15.
- **None** – Use this option to bypass all untagged traffic.
- **Any** – Use this option to bypass any tagged or untagged traffic. This option is selected by default.

- **Segments** Bypass a port by choosing the incoming port from the list and clicking **Add**.

> **Note**
> Inspection bypass applies to incoming traffic only.

3. Click **OK**.

Inspection profile settings

Select **Policy > Settings** to configure the following:

Setting	Description
Connection Table	Specifies the global timeout interval for TCP traffic or non-TCP traffic on the connection table. For blocked streams in the connection table, this value determines the time interval that elapses before the blocked connection is cleared from the connection table. Before the timeout occurs, the device blocks any incoming packets for that stream. After the connection is cleared (the timeout interval expires), the incoming connection is allowed until traffic matches another blocking filter.
Trust Streams	Specifies the global timeout interval for trusted streams. This value determines the time interval that elapses before the trusted stream is flushed.
Quarantined Addresses	This value determines the time interval that elapses before the quarantined host can be released. After the quarantined host is released (the timeout interval expires), quarantined addresses can be automatically released, if you select that option.
HTTP Response Processing	Specifies inspection of encoded HTTP responses. • **Accelerated inspection of encoded HTTP responses** — Uses hardware acceleration to detect and decode encoded HTTP responses. • **Inspect encoded HTTP responses** — Enables strict detection and decoding of encoded HTTP responses. • **Ignore encoded HTTP responses** — The device does not detect or decode encoded HTTP responses. **Enable decoding of URL encodings and Numeric Character References (NCR).** This option is enabled by default.
GZIP Decompression	Decompresses files that have been compressed in the gzip file format.

Setting	Description
Asymmetric Network	Specifies whether the device is configured for an asymmetric network. When you enable asymmetric configuration, the device does not see both sides of a TCP connection. This option is disabled by default. **Note** You must disable Asymmetric Network mode in order to run SSL inspection, DDoS filters, and the following filter numbers (all disabled by default): • 13360: SMB: Sourcefire Snort rule Buffer Overflow Vulnerability • 13405: RFB: GNOME Vino VNC Server Denial-of-Service Vulnerability • 13566: HTTP: Microsoft SharePoint 2010 Flat Forum Page • 16310: TLS: OpenSSL Denial-of-Service Vulnerability over SMTP • 16564: TCP: Kerberos 5 SPNEGO Token Denial-of-Service Vulnerability • 28018: SMB: Response for Domain Computers from Domain Controller • 30094: SMTP: Exim BDAT Use-After-Free Vulnerability • 30473: HTTP: Squid Proxy log_uses_indirect_client Denial-of-Service Vulnerability • 31765: HTTP: Squid Reverse Proxy sslBumpAccessCheck Denial-of-Service Vulnerability (ZDI-18-309) • 33923: HTTP: Google Golang Get Command Execution Vulnerability
DNS Reputation	Enables the device to respond with `NXDOMAIN (name does not exist)` to clients that make DNS requests for blocked hosts.
HTTP Mode	Enables all TCP ports to be treated as HTTP ports for inspection purposes. If a flow does not have HTTP traffic, HTTP processing stops so that optimum performance is maintained.
IDS Mode	When you enable IDS mode, the device configuration becomes adjusted so that the device operates in a manner suitable for Intrusion Detection System (IDS) scenarios and filter configurations. • Performance protection is disabled. • Adaptive Filtering is set to Manual. • Filters currently set to Block are not switched to Permit, and Block filters can still be set. When you change IDS Mode settings, reboot the device for the change to take effect. **Important** Changing IDS Mode does not change Performance Protection mode. For best results, when enabling IDS Mode, go to the **System > Settings > Log Configuration > Performance Protection** page and change Performance Protection to **Always log Alert and Block events** mode.
Reset Security Profile	Removes all user-created security policy configuration changes from the device, including user-created profiles, user-created virtual segments, filter configurations in security profiles, and action sets.

Object configuration

You can monitor and configure the settings for objects used by the device.

Action sets

Note

This is an Instant-Commit feature. Changes take effect immediately.

Action sets determine what the device does when a packet matches a rule or triggers a filter. An action set can contain more than one action, and can contain more than one type of action. The types of action that determine where a packet is sent after it is inspected include the following:

- A permit action enables a packet to reach its intended destination.
- A block action discards a packet. A block action can also be configured to quarantine the host and/or perform a TCP reset.
- A rate limit action enables you to define the maximum bandwidth available for the traffic stream.
- A trust action enables the designated traffic to bypass all inspection; the traffic is transmitted immediately. Trust has lower latency than Permit, and using it can reduce load on the CPU and processors.

Action Name	Description
Recommended	The default action set, as determined by the filter's category settings. When you assign this action set to a filter, the filter uses the recommended action setting for the default category settings. The recommended action set can enable different configurations for filters within the same category. Under a recommended category setting, some filters are disabled while others are enabled; some might have permit actions assigned while others are set to block.
Block (+TCP Reset)	Blocks a packet from being transferred to the network. You can use the TCP Reset option for resetting blocked TCP flows.
Block + Notify (+TCP Reset)	Blocks a packet from being transferred. Notifies all selected contacts of the blocked packet. You can use the TCP Reset option for resetting blocked TCP flows. When you create an action set with Block + Notify + TCP Reset Destination, when a Reputation filter is hit, the TCP Reset to the Destination IP does not work properly. To resolve this problem, do not use the 'tcp reset' feature or only use 'tcp reset both' when the trigger reason is Reputation.
Block + Notify + Trace (+TCP Reset)	Blocks a packet from being transferred. Notifies all selected contacts of the blocked packet. Logs all information about the packet according to the packet trace settings. You can use the TCP Reset option for resetting blocked TCP flows.
Permit + Notify	Permits a packet and notifies all selected contacts of the packet.
Permit + Notify + Trace	Permits a packet. Notifies all selected contacts of the packet, and logs all information about the packet according to the packet trace settings.
Trust	Not configured on the device by default; you must create a Trust action set for this action to be displayed on the table. Enables trusted traffic to pass without inspection. Lower latency than Permit. Cannot be used with DDoS or IP Reputation filters.

Add or edit an action set

Procedure

1. Select **Policy > Objects > Action Sets**.
2. Click **Add** to create a new action set or **Edit** to change an existing one.

3. Under the General tab:

   a. Enter the name of the action set.

   b. (Optional) Select the action from the **Action** list.

   c. Select whether the option to reset a TCP connection is enabled. With **TCP Reset** enabled, the system resets the TCP connection for the source or destination IP when the Block action executes. You can configure this option on Block action sets.

   d. (Optional) Select **Packet Trace**. Packet Trace enables you to capture all or part of a suspicious packet for analysis. You can set the packet trace priority and packet trace verbosity for action sets.

      - Priority sets the relative importance of the information captured. Low priority items are discarded before medium priority items if there is a resource shortage.

      - Verbosity determines how much of a suspicious packet is logged for analysis. Full verbosity records the whole packet. Partial verbosity enables you to choose how many bytes of the packet (from 64 to 25,618 bytes) the packet trace log records.

4. Under the Notification Contacts tab, configure notification contacts (either human or machine) that get sent messages in response to a traffic-related event. You can configure any of the following notification contacts to be notified when the action is triggered:

   - Remote System Log – Sends messages to a syslog server on your network. This is a default contact available in all action sets.

   - Management Console – Sends messages to the LSM device management application. This default contact is available in all action sets. If you select this contact, messages are sent to the Alert or IPS Block Log in the LSM, depending on whether a permit or block action has executed.

5. Under the Quarantine tab, assign a quarantine action set to a filter. You can select the following quarantine options for the action set:

   - (Optional) Select **Quarantine hosts that trigger this action** to quarantine the IP addresses that trigger this option.

      - Select **Quarantine hosts after first hit** to quarantine the host after the first hit.

      - Select **Quarantine host after** to activate the quarantine after the specified number of hits (2 – 10,000) during the specified number of minutes (1 – 60).

   - Select **Block non-HTTP traffic sent from quarantined hosts** – To block the non-HTTP requests.

   - Select an action from the **Response to HTTP traffic sent from quarantined hosts** list:

      - **Displaying quarantine info** – Select **Event that triggered the quarantine action** to display the events that triggered the quarantine action and select **Text below** to insert custom text.

      - **Blocking it** – To block the response to the HTTP traffic.

      - **Redirecting to the following site** – To redirect the HTTP requests from the quarantined host to a website.

6. Under the Quarantine Exceptions tab, you can select the following quarantine exceptions for the action set if you enabled the **Quarantine hosts that trigger this action** option in the preceding step:

   - **Only quarantine these hosts** – To quarantine specified hosts, enter the IP address/mask and click **Add**.

   - **Do not quarantine these hosts** – To exclude the specified hosts from quarantine, enter the IP address/mask and click **Add**.

- **Allow quarantined hosts to access these addresses** – To allow the quarantined hosts to access the specified addresses, enter the IP address/mask and click **Add**.

7. Click **OK** or **OK/Continue** to add another action set.

Notification contacts

Configure notification contacts to send messages to a recipient (either human or machine) in response to a traffic-related event that occurs on the device. The traffic-related event can be the result of triggering an IPS filter configured with an action set that specifies a notification contact. A notification contact can be any of the following:

- **Remote System Log** — Sends messages to a syslog server on your network. The syslog server uses the numbers you specify for the **Alert Facility** and the **Block Facility** to identify the message source. After you configure this contact, verify that your device can reach the remote system log server on your network. If the remote system log server is on a different subnet than the management port, you might need to configure the routing. *Learn more*. This is a default contact available in all IPS action sets.

  CAUTION!

  Remote syslog, in adherence to RFC 3164, sends clear text log messages using the UDP protocol with no additional security protections. Use remote syslog only on a secure, trusted network to prevent syslog messages from being intercepted, altered, or spoofed by a third party.

- **Management Console** — Sends messages to the LSM. This default contact is available in all action sets. If you select this contact, messages are sent to the Alert or IPS Block Log in the LSM, depending on whether a permit or block action has executed. This notification contact does not require any configuration, although you can change the default name and aggregation period.
- **Email or SNMP** — Sends messages to the email address or specified SNMP. All email or SNMP contacts must be added from the Notification Contacts page. If the default email server is not configured on the device, you are prompted to configure it before adding a contact. After you configure this option, verify that the email server is reachable from the device, that mail relaying is enabled, and that you use an acceptable account/domain.

  Note

  SNMP notification contacts require SNMPv2, and do not work when SNMPv2 is disabled. Before creating an Email or notification contact, you must configure Email and SMTP server settings on the device from the **System > Email** page. *Learn more*.

After configuring notification contacts, you can select them for IPS filter events when you create or edit the action set assigned to the filter. You cannot delete the default Remote System Log and Management Console contacts. You cannot delete a Notification Contact if it is currently configured in another Action Set.

Note

Changes to notification settings take effect immediately.

Alert aggregation and the aggregation period

The device uses alert aggregation to prevent system performance problems resulting from an excessive number of notification requests. Because a single packet can trigger an alert, attacks with large numbers of packets could potentially flood the alert mechanism used to send out notifications. Use alert aggregation to receive alert notifications at intervals to prevent this flooding. For example, if you set the aggregation interval

to 5 minutes, the system sends an alert at the first IPS filter trigger, collects subsequent alerts and sends them out every five minutes.

On the device, the *aggregation period* that you configure when you create a notification contact controls alert aggregation. All notification contacts require this setting.

CAUTION!

Short aggregation periods can significantly affect system performance. The shorter the aggregation period, the higher the system load. In the event of a flood attack, a short aggregation period can lead to system performance problems.

In addition to the user-configured aggregation period, the system also provides alert aggregation services to protect the system from over-active filters that can lower performance.

For email contacts, the aggregation period works in conjunction with the *email threshold* setting configured for the email server. *Learn more*.

Reputation groups

You can create groups of IP addresses and DNS names, known as **reputation groups**, as a part of IPS profiles. Use this feature to create groups of IPv4, IPv6, and DNS addresses and define an action set to apply to all of those addresses.

Any item that you add to a reputation group, such as an IP address or DNS name, gets added to the device's reputation database. Incoming traffic is checked against the database, and the appropriate reputation filters are then applied. While the address or name is being looked up, you can choose to have packets from a suspect address dropped or permitted.

Note

Reputation filter hits in the logs appear to report traffic protocol as `ip` instead of `ip6`. These hits are actually showing the matched signature's *`protocolType`* instead of the traffic *`protocolType`*. Traffic protocols can be confirmed by checking the source and destination addresses.

The TippingPoint SMS offers additional reputation features; learn more in the *Tipping Point Security Management System User Guide*.

Services

Configure additional ports associated with specific services and protocols using the Services page. The additional ports expand the range of traffic scanned by the device. During the inspection process, the device first scans traffic against the standard ports for listed services, and then scans traffic against the list of additional ports you configure. You can configure up to 16 additional ports for each service other than HTTP. For HTTP, you can configure only eight additional ports.

Manage authentication

Use the LSM Authentication pages to accomplish the following tasks:

- Create and manage user accounts
- Set user account preferences

- Manage device certificates
- Manage CA certificates
- Log in administratively to the management console
- Configure fine-grained access to the functional areas of the management console using locally defined users, user groups, roles, or an established LDAP, RADIUS, or TACACS+ server.

Authentication servers

The TPS device supports three types of back-end servers for remote authentication:

- RADIUS Server
- TACACS+ Server
- LDAP Server

Note

You can also configure the SMS as a remote authentication source. Configure this using the SMS interface only. For more information, refer to the *SMS User Guide*.

You can configure and prioritize (in the order in which they are provisioned) up to two RADIUS or TACACS+ groups. Any attempt to configure more than two groups returns an error. You can add, edit, and prioritize up to six individual servers in a group.

When deciding between RADIUS and TACACS+ remote authentication, consider the following:

- RADIUS authenticates over UDP, which requires it to account for transmission errors, such as packet loss. Only passwords are encrypted between a RADIUS client and server.
- TACACS+ authenticates over TCP. Because TCP is a connection-oriented protocol, TACACS+ does not require transmission control the way RADIUS does. While RADIUS encrypts only passwords, TACACS+ uses MD5 encryption on all communication and is consequently less vulnerable to attacks.

Note

By default, LDAP, RADIUS, and TACACS+ servers send traffic over the management port.

LDAP groups

Use the LDAP Groups panel to configure up to six v2 or v3 LDAP servers for administrative login authentication and network user authentication.

The TPS device checks the accessibility of each server when it is created or modified. Inaccessible servers get rechecked periodically by the device (approximately once every five minutes). The system log reflects whether the state of the server has changed. To prevent login delays, the device contacts only accessible servers in order of priority. If all the servers are inaccessible, the device contacts the highest priority server.

The LDAP Server Groups page displays details of the LDAP server groups configured.

Note

The name you provide for each group cannot be changed. To give a group a new name, you must delete the group and re-create it with the new name.

The Bind Distinguished Name (Bind DN) identifies the user on the external LDAP server who has permission to search the LDAP directory. One or more attribute=value pairs, separated by commas, make up the Bind DN. Configure the following fields for the Bind DN:

- **Bind DN** – Provides the user permitted to search the LDAP directory.
- **Bind Password** – Provides the password for the user permitted to search the LDAP directory.
- **Base DN for Tree Search** – Indicates the starting point for searches on the LDAP directory.

The Transport Layer Security (TLS) provides options for encrypting communication to the LDAP server. Configure TOS using the following fields:

- **TLS Encryption** Enables TLS Encryption.
- **Start TLS over LDAP** enables TLS security to use both secure and non-secure requests against the LDAP server in a single connection. For example, modifications to the LDAP server are secure, but reading parts of the directory that are open for unauthenticated viewing do not use secure requests.
- **Valid Server X.509 Certificate** enables the use of an X.509 certificate for secure authentication. Select **Authentication** > **X.509 Certificates** to import the CA certificate required to validate the server's certificate.

RADIUS groups

A RADIUS group is a group of RADIUS servers with a common configuration, including:

- Device user group
- Authentication protocol and the number of server retries

When the authentication protocol is PEAP/EAP-MSCHAPv2, be sure to also import the CA root certificate. The RADIUS group authenticates against the available CA root certificates on the device.

Add or edit RADIUS group

Procedure

1. Select **Authentication > Authentication Servers > RADIUS Server Groups**.
2. Click **Add** to create a new RADIUS group or **Edit** to change an existing one.
3. In the Add RADIUS Server Group dialog, enter a name up to 64 characters in length.

   Note

   The name you provide for each group cannot be changed. To give a group a new name, you must delete the group and re-create it with the new name.

4. (Optional) Select the **Default User Group** as None or administrator/operator/superuser or click the ellipses (...), which opens the Add Default User Group dialog, to create a new user group. This is the group a RADIUS user will be assigned if the response contains no Filter-ID attribute.
5. Select the Authentication Protocol from the list:
   - PAP
   - MD5 (EAP-MD5-Challenge, RFC 3748)

- PEAP/EAP-MSCHAPv2

> **Note**
>
> To use the PEAP/EAP-MSCHAPv2 protocol, you must first import the CA root certificate for the RADIUS server or servers in the group. Users interested in TLS can alternatively use PEAP/EAP-MSCHAPv2 authentication.

6. Specify the number of Server Retries between 0 and 3. The default value is 1.
7. In the RADIUS Servers panel, add a server to the group by specifying the following:

Setting	Description
Server	IP Address of the RADIUS server.
Port	Port on the RADIUS server that listens for authentication requests. The default port is 1812.
Timeout	Timeout, between 1 and 10 seconds, for communication with the RADIUS server. Default is 2 seconds.
NAS ID	(Optional) Value of RADIUS attribute 32, NAS-Identifier. The attribute contains a string identifying the NAS (Network Access Server) used in the RADIUS Access-Request packet.
Password	Case-sensitive string used to encrypt and sign packets between RADIUS clients and the RADIUS server, set in the RADIUS client configuration file. Maximum is 64 characters.

8. Click **Add** and then **OK** or **OK/Continue** to enter another contact.
9. Reorder the RADIUS servers to specify the order in which the IPS communicates with the authentication servers in the group. Select the server you want to reorder and click **Move Up** or **Move Down**.

TACACS+ groups

A TACACS+ group is a group of TACACS+ servers with a common configuration, including:

- Device user group
- Authentication protocol and the number of server retries

Add or edit TACACS+ group

Procedure

1. Select **Authentication > Authentication Servers > TACACS+ Server Groups**.
2. Click **Add** to create a new TACACS+ group or **Edit** to change an existing one.
3. In the dialog, enter a name up to 64 characters in length.

> **Note**
>
> The name you provide for each group cannot be changed. To give a group a new name, you must delete the group and re-create it with the new name.

4. Select the **Default User Group** as administrator/operator/superuser (operator is the default) or click the ellipses (...), which opens the Add Default User Group dialog, to create a new user group. This is the group a TACACS+ user will be assigned if the response contains no Filter-ID attribute.

5. Select the Authentication Protocol from the list:
   - ASCII
   - PAP
   - CHAP
6. Specify the number of Server Retries between 0 and 3. The default value is 1.
7. In the TACACS+ Servers panel, click **Add** to add a server to the group, or click **Edit** to edit a server already in the group. You can add up to six servers in a group. In the dialog that opens, specify the following:

Setting	Description
IP Address/Hostname	Specify the remote TACACS+ server by one of the following: • IPv4 address • IPv6 address • hostname • hostname+domain name
Port	Port on the TACACS+ server that listens for authentication requests. The default port is 49.
Secret / Confirm	Case-sensitive string used to encrypt and sign packets between TACACS+ clients and the TACACS+ server, set in the TACACS+ client configuration file. Minimum of one character is required. Maximum is 64 characters.
Timeout	Timeout, between 1 and 15 seconds, for communication with the TACACS+ server. Default is 15 seconds.
Test Configuration	(Optional) Specify a name and password for testing access to the TACACS+ server, and click **Test**. A popup message reveals one of two possible results: • `Successfully connected to remote TACACS+ Server.` • `Failed to connect to remote TACACS+ Server.`

Note

Two configured servers cannot have the same IP address or hostname. If you attempt to configure a server that duplicates these properties, an error message indicates which server you are duplicating.

8. Reorder the TACACS+ servers to specify the order in which the TPS communicates with the authentication servers in the group. Select the server you want to reorder and click **Move Up** or **Move Down**.

Authentication settings

You can configure global authentication settings that apply to local users and groups created on the device. The global authentication settings include options for:

- Password Settings
- Login Settings
- Login Group

Configure authentication settings

Procedure

1. Select **Authentication > Authentication Settings**.
2. In the Password Settings panel, configure the following settings:
   - Password Security Level – Specifies the level of security required when users create a user name and password. The default value is **Medium**. Options include:
     - **None** – User names cannot contain spaces. The maximum password length is 32 characters.
     - **Low** – The same user name and password requirements as the None setting, plus the following additional requirements:
       - User names must be at least six characters in length
       - A new password must be different than the current password, and passwords must be at least eight characters in length
     - **Medium** – The same user name and password requirements as the Low setting, plus the following additional password complexity requirements:
       - Contains at least two alphabetic characters
       - Contains at least one numeric character
       - Contains at least one non-alphanumeric character (examples include `! ? $ * #`). Do not use spaces in the password.
     - **High** – The same user name and password requirements as the Medium setting, but passwords must be at least 15 characters and meet the following additional password complexity requirements:
       - Contains at least one uppercase character
       - Contains at least one lowercase character
       - At least half the characters cannot occupy the same positions as the current password.
   - Password Expiry Time – Specifies the length of time that the password is valid. Default value: **30 days**
   - Password Expiry Action – Specifies the action a user must take if a password expires. Default value: **Force user to change password**
3. In the Login Settings panel, configure the following settings:
   - Maximum Login Attempts – Specifies the number of times a user can attempt to log in. Default value: **4**
   - Failed Login Action – Specifies the action to take if the Maximum Login Attempts is reached. Default value: **Lockout account or IP address**
   - Lockout Time – Specifies the length of time to lock out a user if the Failed Login Action includes a user lockout. Default value: 2 minutes
4. Specify the number of minutes that the LSM and CLI can remain idle before timing out.

   The default is 180 minutes (3 hours) for both interfaces.

5. In the Login Group panel, configure the following settings:
   - Administrative Authentication – Specifies the LDAP, RADIUS, or TACACS+ group to be used for Administrative login to the LSM. The local database of users is always enabled by default.

Device certificates

View information about certificates that have been imported to the device using the Device Certificates table. The status of a certificate can be one of the following states:

- Valid
- Not yet valid – The current date occurs before the certificate "valid from" date.
- Expired – The current date occurs after the certificate "expires on" date.
- Self-signed – Warning that the certificate is self-signed.
- Revoked – CRL has revoked the certificate.
- Invalid CA – Certificate CA is invalid.
- Not verified – Certificate status could not be determined; this results when the CA certificate chain is not complete, or is not marked Trusted.

Add or edit a device certificate

To commit changes to the TPS, you must import both the SSL certificate and its private key from the server of interest. The IPS does not attempt to validate the status of a device certificate.

Procedure

1. Select **Authentication > X.509 Certificates > Device Certificates**.
2. In the Device Certificate panel, click **Import** to import a new SSL certificate or to edit an existing certificate that you first select from the list.
3. Enter the certificate name.
4. Click **Browse** to locate the file.
5. Select the certificate format, either **Base64 Encoded Certificate (PEM)** or **Encrypted Private Key and Certificate (PKCS12)**. When selecting:
   - **PEM** format, the private key must be imported in a separate file. Be sure to select the **Include a Private Key** checkbox, then browse to the private key file. If the private key is encrypted, you must also enter the appropriate password in the Password box.
   - **PKCS12** format, you must enter the appropriate password in the Password box. Note that only one certificate/private key pair will be imported, along with all of the CA certificates contained in the file.
6. Click **OK**.

   The appliance imports the certificate and associated private key, and the Device Certificates table displays the certificate.

Request a certificate

You can send a Certificate Signing Request (CSR) to a certificate authority to apply for another public key certificate that you can export.

Procedure

1. Select **Authentication > X.509 Certificates > Device Certificates**.
2. In the Certificate Requests panel, click **New** to add a new certificate request.
3. Complete the Add Certificate Request dialog using the following guidelines.

Option	Description
Certificate Name	Title for identifying the certificate.
Common Name (CN)	Fully qualified domain name or IP address of the subject.
Key Size	Size of the key in bits. The recommended size is 2048 bits (default).
Country Code (optional)	Two-letter ISO code for your organization's nation.
State or Province (optional)	Spell out the name of your organization's state or province. Do not supply an abbreviation.
Locality/City (optional)	Name of your organization's city or locality.
Organization (optional)	Legal name of your organization. Include suffixes, such as Corp. and Ltd.
Organization Unit (optional)	Department name within your organization, such as Human Resources or Accounting.
Email (optional)	Email address of the IT department or certificate administrator for your organization.
FQDN (optional)	Alternate DNS of the subject.
User FQDN (optional)	Alternate email of the subject.

   Click **OK** to view the request in the Certificate Requests table.
4. Select the CSR and click **Export** to generate the certificate request.

CA certificates

Your device attempts to validate the status of any certificate presented during authentication (such as from an LDAP server). In order to validate a given certificate, you must import a sufficient chain of CA certificates. To import CA certificates, use the **Authentication > X.509 Certificates > CA Certificates** page and add the CA to the Certificate Authority list.

The CA Certificates table contains the following information:

CA Name	Name you specified for the certificate.
Common Name	Name assigned to the CA certificate by the creator. It can be set to any value.
Expires On	Certificate expiration date.
CRL Expiry	Date when the currently loaded Certificate Revocation List (CRL) expires.

Status	One of the following certificate statuses: • Valid • Not yet valid – The current date occurs before the certificate “valid from” date. • Expired – The current date occurs after the certificate “expires on” date. • Self-signed – Warning that the certificate is self-signed. • Revoked – CRL has revoked the certificate. • Invalid CA – Certificate CA is invalid. • Rejected – Specified purpose of certificate is not acceptable. • Not verified – Certificate status could not be determined; this results when the CA certificate chain is not complete, or not marked Trusted.

Any CA certificates that you import that are bundled with PKCS12-imported certificates will be displayed here with the name `<certificate name>_ca`.

User groups

The TPS device provides a predefined set of user groups that each have an assigned role with set access privileges. Each user group can have an associated role that determines the type of administrative functions that are allowed. If a user group does not have any management roles, you can still use the group in policy configuration.

Administrative users can create, edit, and delete any user group except the default groups:

- Administrator – Has Read/Write privileges to all TPS device capabilities except administering local users, user groups, and roles. Assign administrator privileges to an enhanced administrator user who can view, manage, and configure functions and options in the system.
- Operator – Has Read-only privileges to all TPS device capabilities. Assign operator privileges to a base-level administrator user who monitors the system and network traffic.
- SuperUser – Has Read/Write/Execute privileges to all TPS device capabilities. SuperUser privileges include full access to all LSM and CLI functions.

Local users

You can create users and add them to a user group on the local device database. A local user can belong to multiple user groups.

The Local Users table lists all the configured local users, their administrative roles, the user groups to which they belong, and the whether they are currently enabled or disabled.

When you create a user, remember the following constraints:

- User names can contain lowercase letters, uppercase letters, numbers and hyphens. A username cannot be all numbers and cannot start with a hyphen.
- Passwords must have at least one uppercase letter, one lowercase letter, one number, and one special character. The password must be between 8 and 64 characters long.

User roles

Device administrators with the SuperUser role can create custom user roles using the Operator, Administrator, and SuperUser roles as templates for each new role. *Learn more* about the privileges associated with each of these default roles.

You can remove or modify capabilities as needed to custom user roles. This enables more granular control over access privileges based on requirements that correlate with a user's tasks and responsibilities. Only custom user roles can be edited; the default user roles cannot be edited.

Hover over each user role in the User Roles table to see all the capabilities available to someone with that assigned role.

You can create up to four custom user roles.

Reports

To visualize your network activity and measure how current security policies are performing, use the Reports menu. The various reports enable you to analyze traffic patterns and then fine-tune policy as needed.

In addition to the reports available on the Reports page, you can also access reporting information on the Dashboard and Monitor pages. The Dashboard provides information in the form of graphs on device performance. The Monitor page provides additional graphical reports on system health.

Most reports offer several different views of the report data. You can select a different view of the data by selecting an option from drop-down list located on the right side of the page. Not all reports offer the same view options. See the individual report descriptions to see the view options for that report.

You can use one or both of the following refresh methods:

- **Auto Refresh** – Click the **Auto Refresh** checkbox to refresh the contents of the page every 30 seconds.
- **Refresh** – Click the **Refresh** link to perform an instant refresh of the page. You can force an instant-refresh at any time, even if you enabled Auto Refresh.

Reports include the following:

- Activity reports – Contain information about network traffic and network activity, including reports on Rate Limiters, Traffic Profile, and SSL Connections.
- Security reports – Contain information about the performance and activity for the device, including reports of Adaptive filter control, DDos, Quarantines, and Top filter matches.

Rate Limiters report

When traffic triggers an IPS filter configured with a rate-limit action set, traffic from the source IP and port is limited based on the rate-limit settings. Traffic from the source IP address and port to the destination IP address and port remains rate-limited until the connection timeout period expires based on the Connection Table timeout setting configured from the **Policy > Settings** page. The default timeout setting is 1800 seconds (30 minutes).

This activity report shows the percentage consumed for each rate limiter pipe. Data will only be displayed in this report if you define at least one rate limit action set and assign it to a profile.

Traffic Profile report

This activity report shows the number of permitted packets per second, grouped by packet size. Packet size is represented by a color depicted on the legend.

SSL Connections report

The SSL Connections report has two sections:

- **Connections** displays the total number of new SSL connections that were created during the 1-minute reporting interval.
- **Connection Rate** displays the average number of new SSL connections created per second during the 1-minute reporting interval.

Adaptive filter control

This security report shows Application and IPS Security filters that are being evaluated too frequently. These filters might be causing extra system overhead without ultimately matching any traffic, which can cause performance degradation of the device. This can indicate a defective filter, or maybe a filter that does not perform well in your network environment. By default, the device automatically detects a filter that is not performing correctly and disables it. From this report page you can perform the following actions:

- Modify the filter mode. The filter mode options are:
  - **Automatic Mode** – Automatically disables the filter and generates a system message regarding the filter.
  - **Manual Mode** – Generates a system message regarding the filter. Marks the filter as Congested because it is causing device congestion. Does not automatically disable the filter.
- Change the severity level for Adaptive Filter Control log messages.
- Reset the Adaptive Filter Control status.
  - If the filter was disabled in automatic mode, this will re-enable the filter and it will start filtering again.
  - If the filter was disabled in manual mode, this changes the congested state back to false.
- View filter settings.
- Download packet capture.

Note

Changes to Adaptive Filter Control status take effect immediately.

DDoS

This security report shows how often DDoS filters were triggered over a selected time period. Use this report to monitor the rejected connections.

Quarantines

This security report provides data on the hosts that were quarantined over a selected time period.

Top filter matches

This security report has two sections:

- The Top 25 Filter Matches report includes only the IPS filters. It shows the 25 IPS filters with the most hits. The hit counts continue to increment until you reboot the system or click the **Reset Counters** button. The filter numbers are displayed on the y-axis.
- The Filter Matches report has three views from which you can select:
  - The Severity report displays the percentage of filter matches that are critical, major, minor, and low severity.
  - The Action report displays the percentage of filter matches for different actions (block, permit, rate limit, and trust).
  - The Protocol report displays the percentage of filter matches for different protocols (ICMP, UDP, TCP, IPv4 - Other, ARP, Ethernet - Other, ICMPv6, and IPv6 - Other).

  Click **Reset Counters** at the top right to set the count back to zero for the report that you are currently monitoring. If you are currently viewing the Filter Matches by Protocol report and click Reset counters, it will affect only the counts for that report. It will not reset the counts for Filter Matches by Action, Filter Matches by Severity, or Top 25 Filters. If you want to reset the counters for all of these reports, reset each of them separately.

Manage the system

Configure the various settings for the device using the System menu.

This topic contains the following information:

High Availability settings

Manage High Availability (HA) to minimize network downtime in the event of a device failure. Configure HA based on your device deployment:

- Intrinsic High Availability (Intrinsic HA) and Zero Power High Availability (ZPHA) for individual device deployment.
- Transparent High Availability (Transparent HA) for devices deployed in a redundant configuration in which one device takes over for the other in the event of system failure.

Intrinsic High Availability

Intrinsic HA determines how the device manages traffic on each segment in the event of a system failure. If the system fails, the device goes into Layer-2 Fallback and either permits or blocks all traffic on each segment, depending on the Layer-2 Fallback action setting for the segment. Any permitted traffic is not inspected.

On a vTPS virtual appliance, Layer-2 Fallback applies to the virtual ports on the one and only segment.

A lack of reported errors or congestion through the TSE does not guarantee that the components receive correct and error-free traffic. The INHA monitors for several points of failure and applies failure detection logic against the system. All components for the Intrinsic HA are checked for failure.

Intrinsic HA confirms the system health by performing the following checks:

- **Check back-pressure** — Presence of back-pressure indicates packets are queued for processing. It indicates a failure if it does not process packets.
- **Determine traffic requirements** — If the device does not pass traffic, the ability to detect a failure is more difficult. A minimum rate of traffic must pass through the device for best failure detection.
- **Handle non-atomic nature of the data path** — Packet pass through each component at different times and rates. The status of each component is determined independently of each other. INHA uses sampling to determine health.
- **Check and transmit the inbound receive counters** — Each component has receive counters incremented by packets received from the previous component. The component transmits these counters incremented as packets to the next component. These counters are the most accurate and most complicated way of detecting health.
- **Dropped packets exceeds threshold** — If too many packets awaiting deep inspection are queued up, packets are dropped.
- **Memory lows** — Whether available system memory is too low for proper operations.
- **Various chip set errors** — Represents possible hardware problems.

Each component also has a specific set of functions for failure checking.

From the Segments page, you can view and configure the Layer-2 Fallback behavior for each segment. *Learn more*.

Note

The default setting for each segment is to **Permit All** traffic. This setting is usually preferred by service providers because it prevents a device outage from becoming a network outage. However, for greater security, you might want to change the default Layer-2 Fallback setting to **Block All** to guarantee that no uninspected traffic enters the network.

From the High Availability page, you can verify whether Layer-2 Fallback is enabled, and manually enable or disable Layer-2 Fallback.

Important

When you reboot the device, Layer-2 Fallback does not persist. After the device reboots, the device resumes normal inspection across all segments.

Transparent High Availability

Deploy Transparent HA in a redundant network configuration so that a partner device takes over in the event of system failure. Transparent HA partner devices constantly update each other with their managed streams information (blocked streams, trusted streams, and quarantined hosts). If a system failure occurs, interruptions to network protection are minimized because the partner device does not have to rebuild all of the current managed streams information.

Important

When you enable Transparent HA, a hijacked partner device or a rogue device that impersonates the IP address of a Transparent HA partner device can communicate with the partner device.

Use the **System** > **Settings** > **High Availability** page of the LSM to configure and enable Transparent HA. When you configure Transparent HA, keep the following points in mind:

- Connect the following TPS devices:
  - With the exception of 8200TX and 8400TX devices, TPS devices in an Transparent HA configuration can only be connected—through the HA port—to an identical model device (for example, you can only connect a 2200T device with another 2200T device). The 8200TX and 8400TX devices are the only two TPS devices that can be mixed in a Transparent HA configuration. Connect these two devices using the management (MGMT) ports
  - Connect T-Series devices by using the HA ports and by providing the serial number of the partner device.
  - Connect TX-Series devices by using the management (MGMT) ports and by providing the management IP address of the partner device.
- If the **Encrypt Traffic** option is selected, you must provide a passphrase for the encryption. The passphrase can be no longer than 32 characters and can consist of alphanumeric characters, the hyphen (-), underscore(_), and ampersand (&).

  Note

  For improved performance, do not encrypt the traffic if the HA port network traffic is physically secure.
- TRHA requires the same TOS version on each TRHA device.
- THRA partners must be able to communicate with each other on TCP port 9591.
- On a vTPS virtual appliance, Transparent HA is not supported.

If you plan to change the global timeout interval on the connection table, be sure to update both partner devices. Transparent HA does not synchronize changes to the global timeout interval.

Zero-Power High Availability

Configure *Zero-Power High Availability (Zero Power HA)* for constant, non-interrupted flow of traffic. During a system outage, Zero Power HA bypasses the device and provides continuous network traffic. Configure ZPHA to determine its state:

- *Bypass mode* bypasses the TSE and maintains high availability of any network segments that have ZPHA support. When the device loses power, any network segments that do not have Zero Power HA support are disconnected.
- *Normal mode* inspects traffic according to the TSE settings.

Important

If you enable ZPHA bypass, bypass persists when you reboot the device.

Zero Power HA support varies by device:

- On a TX Series device, optional bypass I/O modules provide HA for copper and fiber segments.

  Note

  When you insert a bypass I/O module, the bypass I/O module always starts up in bypass mode. A bypass I/O module remains in bypass mode until you remove it from bypass mode. To change the module from bypass mode to normal mode using the LSM, select **System -> High Availability -> Zero-Power HA**. To configure this using the SMS or device CLI, refer to the respective documentation. Rebooting the TPS does not change the bypass mode of the bypass I/O module.

- On a 2200T security device, ZPHA support is built-in for copper segments. An external ZPHA module is required to enable ZPHA on SFP and SFP+ segments.
- On a 440T security device, ZPHA support is built-in for copper segments only.
- On a vTPS virtual appliance, ZPHA is not supported.

The following table shows how the traffic would be handled with different states L2FB and Zero Power HA:

L2FB STATE	ZPHA STATE	TRAFFIC STATUS
Normal	Normal	Traffic inspected as per device configuration
L2FB	Normal	Traffic flow based on segment Layer 2 Fallback action setting
Normal	Bypass	Traffic passed uninspected
L2FB	Bypass	Traffic passed uninspected

Configure the management interface

The Management Port provides a separate network connection on the TPS for communication. With this port, you can connect the device to a dedicated management network, separating the management network from the data networks. However, the management network and the data networks can overlap with each other. The TPS ships with a default IP address of `192.168.0.1`. You can use the **System > Management Port** page to modify the default configuration.

Management interface settings

Use the **System > Management Interface > Settings** page to configure the following options:

- Enable or disable the CLI and LSM.
- Specify identification information for the device, such a name and location.

Note

A valid hostname consists only of alpha-numeric characters and hyphens, and cannot exceed 63 characters or have a hyphen at the beginning or end.

Enable the command line and web interfaces

Enable or disable management access to the TPS through the following:

- LSM — Web-based GUI for managing one device. The LSM provides HTTPS (secure management) access. This access requires access from a supported web browser (Internet Explorer, Mozilla Firefox, and Netscape). Using the LSM, you have a graphical display for reviewing, searching, and modifying settings. The GUI interface also provides reports to monitor the device traffic, triggered filters, and packet statistics.
- CLI — Command line interface for reviewing and modifying settings on the device. Access the CLI through SSH (secure access).

Disable TLS versions

Disable older TLS versions to secure the management interface. When deciding which TLS versions to disable, keep in mind that the LSM and the SMS communicate with the device through the management interface.

Tip

If you cannot connect to the LSM after disabling TLS versions, re-enable a TLS version on the device by using the **`{running-gen}tls`** CLI command.

Modify device details

Use the Device Details panel to enter identification information for the device, such as a specific name for it, its location in your facility, and a contact person.

Note

A valid hostname consists only of alpha-numeric characters and hyphens, and cannot exceed 63 characters or have a hyphen at the beginning or end.

Management port settings

Use the management port to connect your device to a dedicated management network. The device separates the management network from the networks connected to the Network Ports.

Use the **System > Management Interface > Management Port** page to configure management port IP addresses and routes.

Change the management port IP address

You can change the IP address of your device to match your corporate IP address standards or security policy for management devices.

The IP address, which is used to connect to your TippingPoint device, must be a valid address in the form xxx.xxx.xxx.xxx/xx on the network segment to which the device is connected. If the routing prefix size is not

specified, the default is 24. To help prevent a direct attack on the port, configure the management port on the device to use a non-routed IP address from the RFC 1918 Private Address space.

Add management port routes

If you use a separate management network, you might need to configure static IP routes to enable remote network management to the device. The management port uses separate IP routes to those used on the network ports and cannot use dynamic routing.

Routing options enable communication with network subnets other than the subnet on which the management port is located. If your device only communicates with devices on the local network subnet, you do not need to configure a management port route, regardless of whether you are using IPv4 or IPv6.

However, if you are using IPv4 and the device does communicate with devices that are not on the local IPv4 subnet or accessible through the default gateway, you must define the routes to these devices.

CAUTION!

Modifying the management port routes can interrupt the LSM session.

Set management port filters

Use the Management Port Filters page to permit or deny specific services from specific IP addresses on the management port. The Default Rule permits or denies traffic if there are no Management Port Filters set that apply to the incoming traffic. By default, the management port permits management unless you configure management filters.

Note

Modifying the management port filters can interrupt the LSM session. For example, if you deny HTTPS, you can no longer access the LSM through the management port.

Set the date and time

Your device uses the system time in log files. To ensure log file accuracy, facilitate log analysis, and establish predictable scheduling, configure the correct time zone and timekeeping mechanism before using the device in a live environment.

Use the Date/Time page to manage the time setting on the device. You can manually change the current system and time zone or use Network Time Protocol (NTP). If using NTP, you must have access to at least one NTP server.

The default time zone for the device is Greenwich Mean Time. If you change the default, the LSM logs display time data based on the specified time zone. Although the system logs are kept in GMT, the LSM translates these time values into local time values for viewing purposes.

To avoid the man-in-the-middle vulnerability of SNTP servers, users can configure a Network Time Protocol (NTP) server to authenticate NTP messages received from NTP servers and peers. Any attacks of the NTP infrastructure that attempt to inject false time messages must have these messages authenticated (if the **Enabled** option is selected). When authentication is enabled, the client authenticates all time messages before they can be accepted as a time source. At least one NTP server is required. As a best practice, add between and four and eight NTP servers.

Configure email

Note

This is an Instant-Commit feature. Changes take effect immediately.

Use the Email page to configure the default email settings to use when sending alerts, notifications, and logs by email. After configuring the email server, you must also configure email contact information from the Notification Contacts page (**Policy > Notification Contacts**). *Learn more*.

The **From Email Address** field is used as the Reply-To address for messages sent from the device. Consider entering your device name as your company domain, as in `devicename@your_company.com`.

By default, the **Email Threshold (per minute)** option allows 10 email alerts per minute. On the first email alert, a one-minute timer starts. The systems sends email notifications until it reaches the threshold and then blocks subsequent alerts. After one minute, the system resumes sending email alerts. The system generates a message in the System log whenever email notifications are blocked.

Manage data security

Manage data security by configuring the master key and by securing the external user disk.

By default, the system keystore is always secure. The system master key protects the system keystore with encryption. The *system keystore* retains sensitive data, such as device certificates and private keys.

The *external user disk* stores all traffic logs, snapshots, the Threat DV URL Reputation Feed, the User-defined URL Entries database, and packet capture data. By default, the external user disk is not encrypted.

Note

Snapshots do not include sensitive information from the system keystore.

Set the master key

You can set the master key to a device-generated key that is unique to the device or specify your own *master key passphrase*. By default, the system keystore comes encrypted with a device-generated master key.

As a best practice, set the master key to a passphrase that you specify to avoid keystore issues with a TOS rollback. If the keystore in the rollback image is secured with a different master key than the master key that is set on the device, you can set the master key to the correct passphrase. *Learn more* about rolling a TOS back to a previous version.

A passphrase that you specify must meet the following complexity requirements:

- Must be between 9 and 32 characters in length
- Combination of uppercase and lowercase alpha and numbers
- Must contain at least one special character (`!@#$%`)

Before you change the master key, keep in mind the following points:

- By default, the external user disk is not encrypted. This enables you to easily access the contents of the external user disk from a different device.
- If you choose to encrypt the external user disk, the master key encrypts and decrypts the external user disk.

  - If you change the master key while the external user disk is encrypted, all traffic logs, snapshots, Threat DV URL Reputation Feed, User-defined URL Entries database, and packet capture data are erased from the external user disk.
  - To access the contents of an encrypted external user disk from a different device—for example, to restore a snapshot—the same master key must also be set on the device.
- *Learn more* about enabling encryption on the external user disk.

Secure the external user disk

Enable encryption on the external user disk (CFast or SSD) to secure its contents with the system master key. The external user disk stores all traffic logs, snapshots, the Threat DV URL Reputation Feed, the User-defined URL Entries database, and packet capture data.

By default, the external user disk is not encrypted. This enables you to easily access the contents of the external user disk from a different device.

Before you secure the external user disk, keep in mind the following points:

- When you change the encryption status of the external user disk, the device automatically formats the disk and all data is erased. On large, external CFast disks (32 GB or more), it can take 40 seconds or more to complete disk format and encryption operations.
- The system master key encrypts and decrypts the external user disk. To access the contents of an encrypted external user disk from a different device—for example, to restore a snapshot—the same master key must also be set on the device.

Configure logs

The logs provide information on system events and traffic-related events triggered by the filters that you configured on the device. Each menu page also provides functions to manage the log files. Logs also indicate the interfaces through which administrators interacted with the system, such as the LSM, the CLI, or an SMS.

Use the **System > Log Configuration** menu to configure and manage the following items for logs:

- Associate Notification Contacts to System, Audit, and Quarantine logs.
- Manage the alerting threshold for the Alert and Block logs to improve device performance.
- Clear all entries from a log and download logs.

Manage notification contacts

Use the Notification Contacts page to configure notification contacts and thresholds for the following logs:

- System
- Audit
- Quarantine
- SSL Inspection

You can manage the notifications for other logs from the **Policy > Notification Contacts** page.

By default, all notifications are sent to the Management Console. However, you can change this setting for the System and Quarantine logs by editing the default configuration and selecting a different Severity Threshold. The Threshold Severity level cannot be changed for the Audit log.

To edit the default notification contact configuration for the logs:

1. Select **System > Log Configuration**.
2. Click **Notification Contacts**.
3. Click **Edit** for the log you want to modify.
4. In the Edit Log Notification Contacts dialog, select a severity from the Severity Threshold list.

Note

This can be configured only for System and Quarantine logs.

none	Notifications are not sent under any condition.
Debug	A debug condition occurred.
Info	Informational message.
Notice	Normal, but significant conditions exist.
Warning	A warning condition occurred.
Error	An error occurred.
Critical	A critical condition exists.
Alert	Action must be taken immediately.
Emergency	System is unstable.

5. Click **OK**.

Protect device performance

When traffic congestion on the device significantly impacts performance, use the **System > Log Configuration > Performance Protection** page to temporarily disable logs for Alert and Block events.

The default configuration is to disable Alert and Block events for 600 seconds (10 minutes) when device congestion renders a packet loss value of 1 percent.

View and download a log

Use the **System > Log Configuration > Summary** page to view and download logs, get size and location information for each log, and clear log entries.

Configure SMS

The SMS enables you to remotely monitor and manage your device. When the device is under SMS control, you can use the LSM to do the following:

- View, manage, and edit device configuration.
- Review logs and reports.
- Configure security policy.

When a device is under SMS management, the LSM displays the message `DEVICE UNDER SMS CONTROL` in red at the top of each page. The SMS page displays the serial number and the IP address of the controlling SMS. In this state, you can view system configuration and status.

Note

Changes to SMS system settings take effect immediately.

To configure SMS management:

1. Select **System > SMS**.

   The default value is **Any IP Address**, which means that any SMS can manage the device.

2. To enter the IP address of a specific SMS, click **Specific IP Address / CIDR** and enter the IP or CIDR address in the box.

   To specify a range of IP addresses, enter an IP address block (`10.100.230.0/24`, for example). This allows any SMS on the specified IP subnet to manage the device.

3. Click **Manage**.

4. To release a device from SMS management, click **Unmanage**.

Enable SNMP

Use the **System > SNMP** menu to configure SNMPv2c and SNMPv3.

After you enable SNMP and commit the change, SNMP creates an Engine ID using the Management Port's MAC address. The engine ID uniquely defines an SNMP node (or engine) and associates it to a user.

After you commit the change, it might take a couple of seconds to start the SNMP demon. In the unlikely case of a collision with another device, you can change the Engine ID to a different value; however, you must make the new value unique. Note that changing the Engine ID regenerates each read-only user, which will affect connectivity.

Update the device

Note

This is an Instant-Commit feature. Changes take effect immediately.

Use the **System > System, DV, Licenses** to perform the following tasks:

- Install a new software version
- Roll back to a previous software version
- Install and remove Digital Vaccine packages
- Install license packages

Upgrade the software to a newer version

TippingPoint Technical Support releases software updates on the TMC. You can download and install updates from this site to get the latest improvements or additions onto the device. Installing a new software package forces a reboot of the device.

Note

You cannot upgrade the software to an earlier TOS version. Instead, use the rollback feature to return to a previously installed image. Each device stores a maximum of three previous TOS versions that you can roll back to. If all three rollback slots are full, the oldest version gets overridden when you perform the TOS upgrade. *Learn more*.

Procedure

1. Log in to the TMC.
2. After you log in, select **Releases > Software > TPS**.
3. Download the latest release to a thumb drive or your local system.
4. When the download completes, log out of the TMC.
5. In the LSM menu bar, select **System > Update > System, DV, Licenses**.
6. In the Software Versions panel, click **Install**.
7. Click the **Browse** button to select the package you downloaded from the TMC.
8. Select the package and click **Install**.

   The package installs and the system is rebooted. After the system reboots, the login page is displayed.

   If the upgrade fails, the device falls back to its current version and configuration and an error is displayed. An entry is also generated in the system log.

   After upgrading the software, create a snapshot to save the configuration. *Learn more* about snapshots.

Rollback to a previous version

Use a rollback operation to revert the currently running software on your device to a previous working version that you select.

Each device stores a maximum of three previous TOS versions that you can roll back to. If all three rollback slots are full, the oldest version gets overridden when you perform your next TOS upgrade. To preserve the oldest TOS version from being overridden, specify and delete another TOS version before you upgrade your TOS. You can remove previous TOS versions by using the LSM (**System** > **Update** > **System, DV, Licenses** > **Software Versions**), the SMS, or the CLI. For complete information on using the SMS or CLI, refer to your product documentation.

When you perform a TOS rollback, you still preserve current configuration settings, but filter settings revert to the settings that were in effect when the rollback version was archived. All filter changes that you made after the target rollback version get deactivated, including attack protection filter updates.

Important

After you roll back, always make sure the master key on the device matches the master key that was used to secure the keystore in the rollback TOS image.

Procedure

1. From the menu bar, select **System > Update > System, DV, Licenses**.
2. In the Software Version panel, select the version you want to roll back to, and click **Rollback To**.

The Software Rollback dialog is displayed warning you that any configuration changes made since this version was last run will be lost.

3. Click **OK** to start the rollback operation.
4. When the rollback completes, verify that the master key on the device matches the master key that was used to secure the keystore in the rollback TOS image.

   From the CLI, edit and save the configuration. If a `Device keystore is locked` message is displayed, the master key does not match. To resolve this issue, complete the following steps:

   - If you know the master key that was set in the TOS rollback image, set the master key to that passphrase. Use the LSM or the `master-key set` CLI command to set the master key.
   - If you do not know the master key:

     a. (TOS 4.x.x images only) Clear the master key and reset the keystore by using the `master-key clear reset-keystore` CLI command.

     b. (TOS 5.x.x images only) Reset the keystore by using the `master-key reset-keystore` CLI command.

     c. Reset the master key by using the LSM or the `master-key set` CLI command.

     d. If the keystore persisted sensitive information, such as private keys for SSL inspection, import the private keys into the keystore and assign the new keys to the appropriate SSL servers.

     e. If the external user disk is encrypted, synchronize the Threat DV URL Reputation Feed and User-defined URL Entries database to the device.

     Note

     If you change the master key while the external user disk is encrypted, you erase the contents of the external user disk, which include the Threat DV URL Reputation Feed and User-defined URL Entries database.

Digital Vaccine packages

When TippingPoint Technical Support discovers new types of network attacks, or when detection methods for existing threats improve, the Digital Vaccine team at the TMC creates and releases new filters to add to your filter database. These filters are released as Digital Vaccine packages.

Note

When you download and install a Digital Vaccine package, verify that the package you download is not larger than the listed amount of free space. An unpacked package might require more space than anticipated, depending on saved snapshots and rollback versions and the size of the available update. To make sure the device has enough disk space, you can delete previously installed software images from the Update page.

When a new Digital Vaccine package is available for download, the TMC team sends notifications to existing customers. You have two options to update the Digital Vaccine on your device:

- Configure the Auto Digital Vaccine option on your device so that the device checks for new Digital Vaccine packages and automatically updates the device as necessary.
- Manually download and install the Digital Vaccine package.

Install a Digital Vaccine

Procedure

1. Log in to the TMC.
2. After you log in, select **Releases > Digital Vaccine> Digital Vaccine**.
3. Download the latest release to a thumb drive or to your local system.
4. When the download completes, log out of the TMC.
5. From the LSM menu bar, select **System > Update > System, DV, Licenses**.
6. In the Digital Vaccine Packages table, click **Install**.
7. Click the **Browse** button to select the package you downloaded from the LSM.
8. Select the package and click **Install**.

Note

You cannot rollback to a previous version of a Digital Vaccine package. To use a previous version, download that version from the TMC and re-install it.

Enable automatic Digital Vaccine updates

You can specify if and when the system automatically updates the Digital Vaccine version.

When Auto DV is configured, the system automatically checks the Digital Vaccine version when you open the Auto DV Update page. The status is listed on the right side of the page. To perform an update immediately, click **Update Now**.

License packages

If your device is managed by an SMS, licenses are automatically updated. Otherwise, you can access new licenses by logging in to your account on the TMC. *Learn more* about installing a license package.

Update the license package

Update your license package to assign a product capability that you have purchased, such as an inspection throughput license, to a particular security device.

To review and manage the capabilities in your license package, go to the TippingPoint License Manager on the TMC.

To install and verify your product license, download your updated license package from the TMC and then install the package by using the LSM.

Important

After you install your license package, if prompted, reboot the device to apply any license updates.

To request a license update, contact your sales representative.

Install a license package

Procedure

1. Log in to the TMC.
2. After you log in, select **My Account > TippingPoint License Package**.
3. Download the necessary license to a thumb drive or your local system.
4. When the download completes, log out of the TMC.
5. From the LSM menu bar, select **System > Update > System, DV, Licenses**.
6. In the License Version panel, click **Install**.
7. In the Install License Package dialog, click **Browse** to select the package you downloaded from the TMC.
8. Click **Install**.

Snapshots

Use *snapshots* to restore a device to a previously known working state.

Using the **System > Update > Snapshots** menu, you can perform the following tasks:

- Create a snapshot
- Import a local snapshot
- Manage current snapshots

The contents of the system keystore are not included in the snapshot. When you restore a snapshot to a different device, you should plan to also import any private key information from the device where the snapshot was taken.

Important

Never delete certificates that are used in snapshots that have, or have had, SSL configurations. Although the system will still complete its reboot sequence after restoring a snapshot that has had its SSL configuration (and corresponding device certificate) removed, the restored SSL configuration will not be functional until you update the private key for each certificate or replace the entire SSL configuration.

Create a snapshot

Create a snapshot to restore the same device or a different device to a previously known working state.

Note

This is an Instant-Commit feature. Changes take effect immediately.

The snapshot includes the stored Start configuration only. It does not include the in-memory running configuration. To include this information, select **Configuration > Commit pending changes and Copy to Start** before you take the snapshot. As a best practice, create a snapshot after upgrading the device software.

Procedure

1. Verify that the external user disk (CFast or SSD) has been installed and properly mounted.
2. From the menu bar, select **System > Update > Snapshots**.
3. In the Create Snapshot panel, enter a descriptive name in the Snapshot Name field.
4. (Optional) Click the appropriate checkboxes:
   - **Include DV Reputation Database** – Includes your custom IP and DNS reputation entries.
   - **Include Manual Reputation Database** – Includes the Threat DV package.
   - **Include Management Port, Cluster and HA Configuration** – Includes your configuration settings for the Management Port and HA. *Learn more* about Management port settings.
5. Click **Create**.

   The system starts the snapshot creation process. After you create the snapshot, it is displayed in the Current Snapshots table and on the external user disk.
6. In **Current Snapshots**, select **Export** to export the snapshot from the external user disk to another drive.

Restore a snapshot

Make sure that the device where you want to restore the snapshot meets the following requirements:

- The TOS version on the device matches the TOS version that was installed when the snapshot was taken.
- The device is the same model as the device where the snapshot was taken. For example, you can restore a snapshot from a 2200T only to another 2200T.

(TPS devices and vTPS virtual appliances only) When you restore a snapshot, keep in mind the following points:

- The contents of the system keystore are not included in the snapshot. When you restore a snapshot to a different device, you should plan to also import any private key information from the device where the snapshot was taken.

  Important

  Never delete certificates that are used in snapshots that have, or have had, SSL configurations. Although the system will still complete its reboot sequence after restoring a snapshot that has had its SSL configuration (and corresponding device certificate) removed, the restored SSL configuration will not be functional until you update the private key for each certificate or replace the entire SSL configuration.

- When you want to restore a snapshot to a different device, and URL Reputation Filtering is enabled, a full synchronization of the Reputation database is required after you restore the snapshot. The snapshot does not include the Threat DV URL Reputation Feed and User-defined URL Entries database. Learn more from the *SMS User Guide*.
- The snapshot includes the license package. The license package provides license information for each of your TippingPoint devices. If the license package that was included in the snapshot is outdated, restore the snapshot and then download and install an updated license package from the TMC.
- (TX Series) The port configuration for each slot is preserved after you restore a snapshot when the same I/O module is installed in the same slot. Otherwise, the port configuration resets to the default.

- If an external ZPHA was configured on the original device, be sure to add an external ZPHA to the target device or update the device configuration to remove ZPHA.

Procedure

1. From the menu bar, select **System > Update > Snapshots**.

   Restoring a snapshot forces a system reboot. You can only restore a snapshot when running the same software version that was used to create the snapshot. If you have upgraded the software, you must install the previous software version before restoring that snapshot. As a best practice, review the licensing and configuration after restoring the snapshot to a different device, and take a snapshot after upgrading your software. When you restore a snapshot, you lose any configuration changes made to the current configuration.

2. In the Current Snapshots panel, click the checkbox next to the snapshot you want to restore.

3. Click **Restore**.

   The system loads the snapshot and restores the device to the configuration specified in the snapshot. After the snapshot is loaded, the device reboots and returns you to the login page.

Shut down the device

Use the `halt` command to shut down the TippingPoint operating system and halt the CPU while maintaining power to the device. After you run this command, the device still has power so Layer-2 Fallback (L2FB) enables traffic to pass through the device. To restart the device, remove power, wait 15 seconds, and then reapply power. For the 2200T and TX Series devices, you can remove power by holding down the front panel power button for 5 seconds. Restore power by pressing the power button.

Tools

You can accomplish the following tasks from the Tools menu:

Issue a ping

Use the Ping utility to find out if a specific host or device is accessible. This utility supports both IPv4 and IPv6.

Issue a trace route

Use the Trace Route utility to display the path and transit information for packets being sent across an IP network.

Create a Tech Support Report

The Tech Support Report collects diagnostic information into a report that TippingPoint Technical Support can use to debug and troubleshoot system issues. It includes diagnostic commands, log files, and optionally a full system snapshot. The Tech Support Report snapshot captures the system's current running configuration.

Note

If you include a snapshot with your Tech Support Report, the snapshot does not contain the following sensitive information:

- User names and passwords
- LDAP, RADIUS, and TACACS+ server passwords
- SNMPv3 passphrase
- HA passphrase
- Keystore

After the report is created, you can export it to your local system. You can then email the file to TippingPoint Technical Support for assistance.

Do not attempt to restore a Tech Support Report snapshot to your device. All sensitive information including user names and passwords are removed and you will be unable to log in. If you attempt to restore a Tech Support Report and you cannot log in, phone TippingPoint Technical Support.

Note

Only one report can exist on the device. When you create a new report, you replace the previous report.

Start a traffic capture

The Traffic Capture page provides a listing of captured traffic that you can download for inspection. To capture traffic in response to a filter match, you must enable the Packet Trace option when you create an Action Set. *Learn more* about creating an Action Set. The external user disk (SSD or CFast) stores all captured traffic files.

Use traffic capture expressions to narrow down the types of traffic that are captured. Expressions follow the same syntax as those used in `tcpdump` and `libpcap`. You can use them to filter packets according to protocols, ports, destinations, content, or combinations of these.

Note

When you want to capture MAC-in-MAC (IEEE 802.1ah) traffic, keep the following points in mind:

- Device support for MAC-in-MAC is limited to the TPS 8200TX and 8400TX devices.
- You can verify that the device recognizes MAC-in-MAC traffic by running the `debug np stats show npParseStatsInst` CLI command on the device or by taking a packet capture. When you configure the packet capture, specify a TCPDump expression that identifies the Backbone MAC address (B-MAC) or Backbone VLAN identifier (B-VID) of the traffic you want, or capture all packets for particular segment.

You can also use the `actionsets` context of the CLI to create an action set to capture traffic. You can use the CLI commands `tcpdump` with the `record` option to create an on-demand packet capture dump. For example `ips{}tcpdump 1A record 1A_capture maxsize 4`. You must specify either a `count` (max number of packets to capture) or a `maxsize` (maximum packet capture file size in millions of bytes; for example, `maxsize 4` means 4,000,000 bytes) to prevent accidentally filling up the external user disk.

Inspect a packet trace

The Packet Traces page lists packet traces that you can download for inspection. A packet trace captures for analysis all or part of any packet that matches a signature that triggers the packet trace action. In addition,

the Packet Traces page displays any captures that were recorded using `tcpdump` (`filename.pcap`). *Learn more* about configuring packet traces.