# SonicOS 7

# DPI-SSL

## Administration Guide

SONICWALL®

# Contents

1

# About DPI-SSL

ⓘ **NOTE:** DPI-SSL is a separate, licensed feature that provides inspection of encrypted HTTPS traffic and other SSL-based IPv4 and IPv6 traffic.

**Topics:**

- Using DPI-SSL
- Deployment Scenarios
- Customizing DPI-SSL
- Connections per Appliance Model

## Using DPI-SSL

**Topics:**

- Supported Features
- Security Services

## Supported Features

Deep Packet Inspection of Secure Socket Layer (DPI-SSL) extends SonicWall’s Deep Packet Inspection technology to the inspection of encrypted HTTPS traffic and other SSL-based traffic. The SSL traffic is decrypted (intercepted) transparently, scanned for threats, and then re-encrypted and, if no threats or vulnerabilities are found, sent along to its destination.

DPI-SSL provides additional security, application control, and data-leakage prevention for analyzing encrypted HTTPS and other SSL-based traffic. DPI-SSL supports:

- Transport Layer Security (TLS) Handshake Protocol 1.2 and earlier versions – The TLS 1.2 communication protocol is supported during SSL inspection/decryption between the firewall and the server in DPI-SSL deployments (previously, TLS 1.2 was only supported between client and firewall). SonicOS also supports TLS 1.2 in other areas as well.
- SHA-256 – All re-signed server certificates are signed with the SHA-256 hash algorithm.

- Perfect Forward Secrecy (PFS) – Perfect Forward Secrecy-based ciphers and other stronger ciphers are prioritized over weak ciphers in the advertised cipher suite. As a result, the client or server is not expected to negotiate a weak cipher unless the client or server does not support a strong cipher.

DPI-SSL also supports application-level Bandwidth Management over SSL tunnels. App Rules HTTP bandwidth management policies also applies to content that is accessed over HTTPS when DPI-SSL is enabled for App Rules.

DPI-SSL for both client and server can be controlled by Access Rules.

**Topics:**

# Support for Local CRL

A Certificate Revocation List (CRL) is a list of digital certificates that have been revoked by the issuing Certificate Authority (CA) before their scheduled expiration date and should no longer be trusted. A problem with contacting the CA for this list is that the browser cannot confirm whether it has reached the CA's servers or if an attacker has intercepted the connection to bypass the revocation check.

Local CRL is relative to typical CRL (or online CRL). For typical CRL, the client needs to download the CLR from a CRL distribution point. If the client is unable to download the CRL, then by default, the client trusts the certificate. Contrary to typical CRL, Local CRL maintains a list of revoked certificates locally in import memory for DPI-SSL to verify whether the certificate has been revoked.

For further information about this feature, contact Technical Support.

# TLS Certificate Status Request Extension

DPI-SSL supports the TLS Certificate Status Request extension (formally known as OCSP stapling). By supporting this extension, the certificate status information is delivered to the DPI-SSL client through an already established channel, thereby reducing overhead and improving performance.

# Blocking of SSH X11 Forwarding

ⓘ | **NOTE:** X11 Forwarding requires a valid SonicWall DPI-SSH license.

X is a popular window system for Unix workstations. Using X, a user can run remote X applications that open their windows on the user's local display (and vice versa, running local applications on remote displays). If the remote server is outside after a firewall and administrator have blocked remote connections, user can still use SSH tunneling to get the X display on a local machine. A user can thus circumvent the application-based security policies on the firewall, thereby creating security risks. As X protocol sessions between applications and X servers are not encrypted while being transmitted over a network, an X11 protocol connection can be routed through an SSH connection to provide security and stronger authentication. This feature is called X11 forwarding An SSH client requests X forwarding when it connects to an SSH server (assuming X forwarding is enabled in the client). If the server allows X forwarding for this connection, login proceeds normally, but the server takes some special steps behind the scenes. In addition to handling the terminal session, the server sets itself up as a proxy X server running on the remote machine and sets the DISPLAY environment variable in the remote shell to point to the proxy X display. If an X client program is run, it connects to the proxy. The proxy behaves just like a real X server, and in turn instructs the SSH client to behave as a proxy X client, connecting to the X server on the local machine. The SSH client and server then cooperate to pass X protocol information back and forth over the SSH pipe between the two X sessions, and the X client program appears on your screen just as if it had connected directly to your display. DPI-SSH X11 forwarding supports these clients:

- SSH client for Cygwin
- Putty •secureCRT
- SSH on Ubutu
- SSH on centos

DPI-SSH X11 Forwarding supports the SSH servers on:

- Fedora
- Ubuntu

SSH X11 Forwarding supports both route mode and wire mode. For:

- Wire mode, SSH X11 Forwarding is only supported in the secure (active DPI of inline traffic) mode.
- Route mode, here is no limitation.

The maximum number of connections supported for SSH X11 Forwarding is same as for DPI-SSH: 1000.DPI-SSH.

# Support for ECDSA-Related Ciphers

DPI-SSL Client supports ECDSA (Elliptic Curve Digital Signature Algorithm) ciphers:

- TLS_ECDHE_ECDSA_WIATH_AES_128_GCM_SHA256
- TLS_ECDH_RSA_WITH_AES_128_GCM_SHA256

# DPI-SSL and CFS HTTPS Content Filtering Work Independently

DPI-SSL and CFS HTTPS content filtering can be enabled at the same time and function as follows:

- If DPI-SSL Client Inspection is disabled, Content Filter Service filters HTTPS connections.
- If DPI-SSL Client Inspection is enabled, but the Content Filter option is not selected, Content Filter Service filters HTTPS connections.
- If DPI-SSL Client Inspection is enabled and the Content Filter option is selected, CFS does not filter HTTPS connections.

## Original Port Numbers Retained in Decrypted Packets

For encrypted connections DPI-SSL/DPI-SSH connections, the decrypted packet shows the destination port as 80 (in the case of HTTPS). When the decrypted packets are observed in packet capture/Wireshark, they now retain the original port numbers. The port number change applies only to the packet capture and not to the actual packet or connection cache.

## Security Services

The following security services and features can use DPI-SSL:

| | |
|---|---|
| Gateway Anti-Virus | Content Filtering |
| Gateway Anti-Spyware | Application Firewall |
| Intrusion Prevention | |

# Deployment Scenarios

DPI-SSL has two main deployment scenarios:

- **Client DPI-SSL**: Used to inspect HTTPS traffic when clients on the appliance’s LAN access content located on the WAN. Exclusions to DPI-SSL can be made on a common-name or category basis.
- **Server DPI-SSL**: Used to inspect HTTPS traffic when remote clients connect over the WAN to access content located on the appliance’s LAN.

# Proxy Deployment

DPI-SSL supports proxy deployment, where all client browsers are configured to redirect to a proxy server, but an appliance sits between the client browsers and the proxy server. All DPI-SSL features are supported in this scenario, including supporting domain exclusions when the domain is part of a virtual hosting server, or in some cloud deployments, wherein the same server IP can be used by multiple domains.

Additionally, typical data center server farms are fronted with a load balancer and/or reverse SSL Proxy to offload SSL processing on the servers. For a load balancer fronting the servers and doing decryption, the appliance usually only sees the IP of the load balancer, and the load balancer decrypts the content and determines the specific server to assign this connection to. DPI-SSL now has a global policy option to disable an IP-based exclusion cache. The exclusions continues to work even if the IP-based exclusion cache is off.

# Customizing DPI-SSL

ⓘ **IMPORTANT:** Add the NetExtender SSL VPN gateway to the DPI SSL IP-address exclusion list. As NetExtender traffic is PPP-encapsulated, having SSL VPN decrypt such traffic does not produce meaningful results.

In general, the policy of DPI-SSL is to secure any and all traffic that flows through the appliance. This may or may not meet your security needs, so DPI-SSL allows you to customize what is processed.

DPI-SSL comes with a list (database) of built-in (default) domains excluded from DPI processing. You can add to this list at any time, remove any entries you've added, and/or toggle built-in entries between exclusion from and inclusion in DPI processing. DPI-SSL also allows you to exclude or include domains by common name or category (for example, banking or health care).

Excluded sites, whether by common name or category, however, can become a security risk that can be exploited in the future by exploit kits that circumvent the appliance and are downloaded to client machines or by a man-in-the-middle hijacker presenting a fake server site/certificate to an unsuspecting client. To prevent such risks, DPI-SSL allows excluded sites to be authenticated before exclusion.

As the percentage of HTTPS connections increase in your network and new https sites appear, it is improbable for even the latest SonicOS version to contain a complete list of built-in/default exclusions. Some HTTPS connections fail when DPI-SSL interception occurs due to the inherent implementation of a new client app or the server implementation, and these sites might need to be excluded on the appliance to provide a seamless user experience. SonicOS keeps a log of these failed connections that you can troubleshoot and use to add any trusted entries to the exclusion list.

In addition to excluding/including sites, DPI-SSL provides both global authentication policy and a granular exception policy to the global one. For example, with a global policy to authenticate connection, some connections may be blocked that are in essence safe, such as new trusted CA certificates or a a self-signed server certificate of a private (or local-to-enterprise deployment) secure cloud solution. The granular option allows you to exclude individual domains from the global authentication policy.

You can configure exclusions for a domain that is part of a list of domains supported by the same server (certificate). That is, some server certificates contain multiple domain names, but you want to exclude just one of these domains without having to exclude all of the domains served by a single server certificate. For example, you can exclude `youtube.com` without having to exclude any other domain, such as `google.com`, even though `*.google.com` is the common name of the server certificate that has `youtube.com` listed as an alternate domain under Subject Alternate-Name extension.

# Connections per Appliance Model

To learn about the hardware model and its maximum concurrent connections to perform the Client DPI-SSL inspections, refer to the following platform datasheets: SonicWall TZ Series.

Refer to the SonicWall resources page for more information about our Product Series. Search for high-end, mid-range, entry level, and virtual firewall details, such as Maximum connections (DPI SSL), from the **By Product Series** drop-down menu.

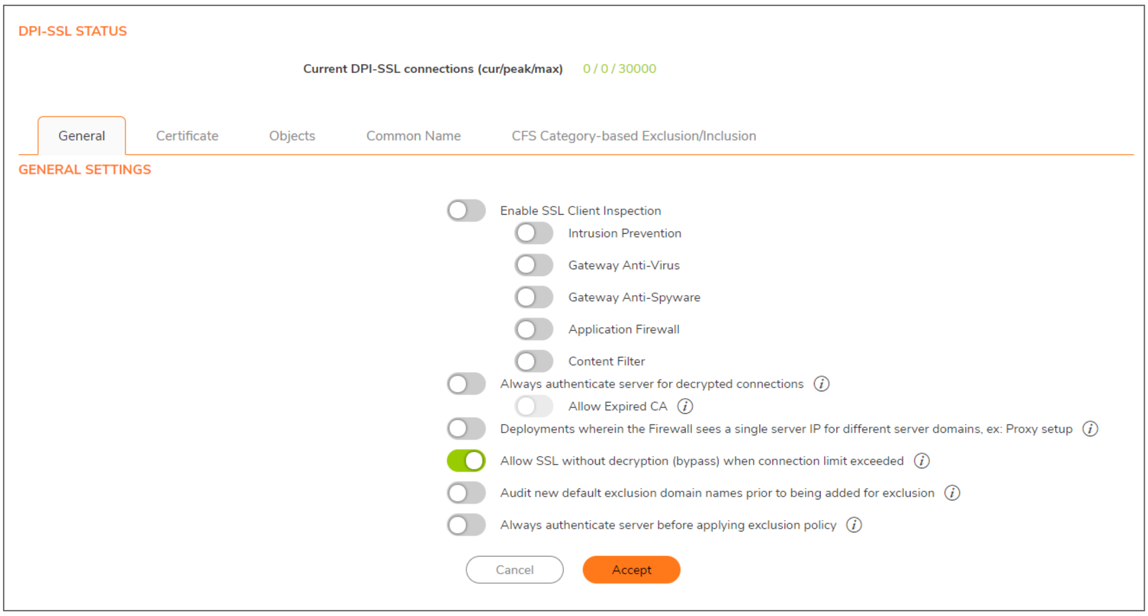
# 2

# Configuring the DPI-SSL/TLS Client

**Topics:**

- Decryption Services > DPI-SSL/TLS Client
- Viewing DPI-SSL Status
- Deploying the DPI-SSL/TLS Client

## Decryption Services > DPI-SSL/TLS Client



DPI-SSL STATUS

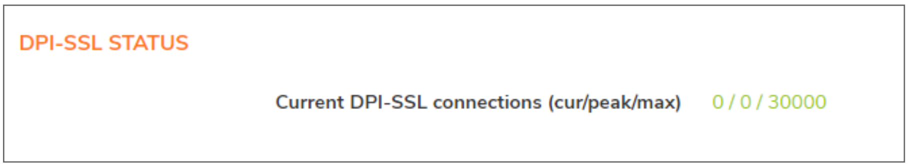
Current DPI-SSL connections (cur/peak/max) 0 / 0 / 30000

GENERAL SETTINGS

○ Enable SSL Client Inspection
  ○ Intrusion Prevention
  ○ Gateway Anti-Virus
  ○ Gateway Anti-Spyware
  ○ Application Firewall
  ○ Content Filter
○ Always authenticate server for decrypted connections
  ○ Allow Expired CA
○ Deployments wherein the Firewall sees a single server IP for different server domains, ex: Proxy setup
● Allow SSL without decryption (bypass) when connection limit exceeded
○ Audit new default exclusion domain names prior to being added for exclusion
○ Always authenticate server before applying exclusion policy

ⓘ | **TIP:** For information about DPI-SSL, see About DPI-SSL.

# Viewing DPI-SSL Status



DPI-SSL STATUS

Current DPI-SSL connections (cur/peak/max) 0 / 0 / 30000

The **DPI-SSL Status** section displays the current DPI-SSL connections, peak connections, and maximum connections.

# Deploying the DPI-SSL/TLS Client

The DPI-SSL/TLS Client deployment scenario typically is used to inspect HTTPS traffic when clients on the LAN browse content located on the WAN. In this scenario, the firewall typically does not own the certificates and private keys for the content it is inspecting. After performing DPI-SSL inspection, the appliance re-writes the certificate sent by the remote server and signs this newly generated certificate with the certificate specified in the Client DPI-SSL configuration. By default, this is the firewall certificate authority (CA) certificate, but a different certificate can be specified. Users should be instructed to add the certificate to their browser's trusted list to avoid certificate trust errors.

**Topics:**

- Configuring General Settings
- Selecting the Re-Signing Certificate Authority
- Configuring Exclusions and Inclusions
- Excluding/Including by Common Name
- Client DPI-SSL Examples

# Configuring General Settings

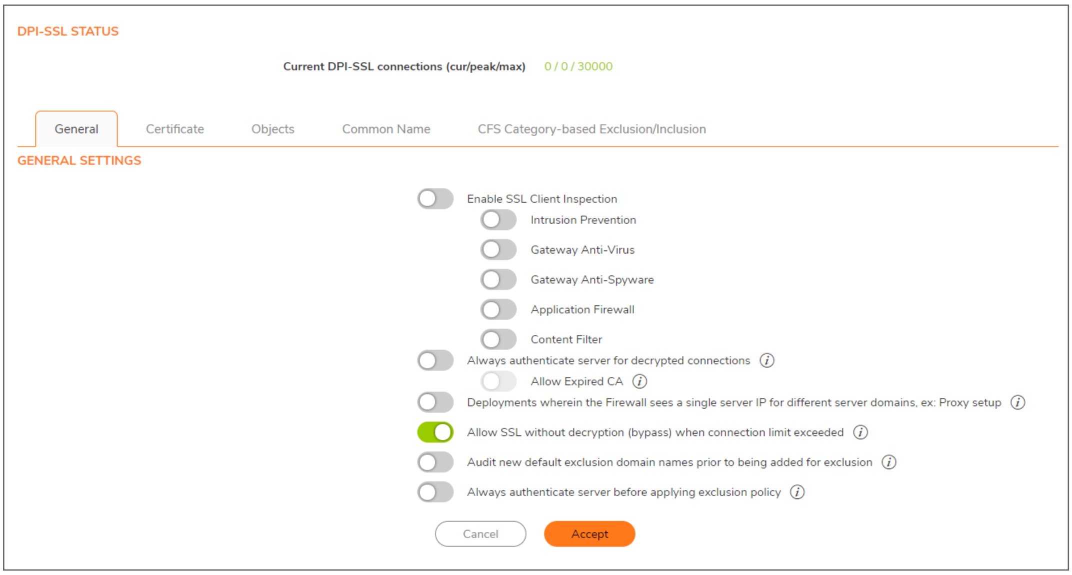
**Topics:**

- Enabling SSL Client Inspection
- Enabling DPI-SSL Client on a Zone
- Enabling DPI-SSL Server on a Zone

## Enabling SSL Client Inspection

***To enable SSL Client inspection:***

1. Navigate to **POLICY | DPI-SSL > Client SSL**.
2. Click **General**.



Current DPI-SSL connections (cur/peak/max) 0 / 0 / 30000

- ○ Enable SSL Client Inspection
  - ○ Intrusion Prevention
  - ○ Gateway Anti-Virus
  - ○ Gateway Anti-Spyware
  - ○ Application Firewall
  - ○ Content Filter
- ○ Always authenticate server for decrypted connections ⓘ
  - ○ Allow Expired CA ⓘ
- ○ Deployments wherein the Firewall sees a single server IP for different server domains, ex: Proxy setup ⓘ
- ● Allow SSL without decryption (bypass) when connection limit exceeded ⓘ
- ○ Audit new default exclusion domain names prior to being added for exclusion ⓘ
- ○ Always authenticate server before applying exclusion policy ⓘ

3. Select **Enable SSL Client Inspection**. This option is not selected by default..
4. Select one or more services with which to perform inspection; none are selected by default:
   - **Intrusion Prevention**
   - **Gateway Anti-Virus**
   - **Gateway Anti-Spyware**
   - **Application Firewall**
   - **Content Filter**
5. To authenticate servers for decrypted/intercepted connections, select **Always authenticate server for decrypted connections**. When enabled, DPI-SSL blocks connections:
   - To sites with untrusted certificates.
   - If the domain name in the Client Hello cannot be validated against the Server Certificate for the connection.

This option is not selected by default. When this option is selected, **Allow Expired CA** becomes available.

ⓘ **IMPORTANT:** Only enable this option if you need a high level of security. Blocked connections show up in the connection failures list, as described in *Showing Connection Failures*.

ⓘ **TIP:** If you enable this option, use the **Skip CFS Category-based Exclusion** option (see *Excluding/Including Common Names*) to exclude a particular domain or domains from this global authenticate option. This is useful to override any server authentication-related failures of trusted sites.

6. To allow expired or intermediate CAs, select **Allow Expired CS**. This option is not selected by default. If it is not selected, connections are blocked if the domain name in the Client Hello cannot be validated against the server certificate for the connections.
7. To disable use of the server IP address-based dynamic cache for exclusion, select **Deployments wherein the Firewall sees a single server IP for different server domains, ex: Proxy setup**. This option is not selected by default.

This option is useful for proxy deployments, where all client browsers redirect to a proxy server, including if appliance is between the client browsers and the proxy server. All DPI-SSL features are supported, including domain exclusions when the domain is part of a virtual hosting server, as part of a server farm fronted with a load balancer, or in some cloud deployments, wherein the same server IP can be used by multiple domains.

In such deployments, all server IPs as seen by the appliance are the proxy server's IP. It is, therefore, imperative that in proxy deployments, IP-based exclusion cache is disabled. Enabling this option does not affect SonicOS's capability to perform exclusions.

8. By default, new connections over the DPI-SSL connection limit are bypassed. To allow new connections to bypass decryption instead of being dropped when the connection limit is exceeded, select the Allow SSL without decryption (bypass) when connection limit exceeded checkbox. This option is selected by default.

To ensure new connections over the DPI-SSL connection limit are dropped, deselect/disable this checkbox.

9. To audit new, built-in exclusion domain names before they are added for exclusion, select the Audit new built-in exclusion domain names prior to being added for exclusion checkbox. By default, this checkbox is not enabled.

When this option is enabled, whenever changes to the built-in exclusion list occur, for example, an upgrade to a new firmware image or other system-related actions, a notification pop-up dialog displays over the **Decryption Services > DPI-SSL/TLS Client** page with the changes. You can inspect/audit the new changes and accept or reject any, some, or all of the new changes to the built-in exclusion list. At this point, the run-time exclusion list is updated to reflect the new changes.

If this option is disabled, SonicOS accepts all new changes to the built-in exclusion list and adds them automatically.

10. To always authenticate a server before applying a common-name or category exclusion policy, select the **Always authenticate server before applying exclusion policy** checkbox. This option is not selected by default. When enabled, DPI-SSL blocks excluded connections:
    - To sites with untrusted certificates.
    - If the domain name in the Client Hello cannot be validated against the Server Certificate for the connection.

This is a useful feature to authenticate the server connection before applying exclusion policies. Enabling this option ensures that the appliance does not blindly apply exclusion on connections and thereby create a security hole for exclusion sites or sites belonging to excluded categories. This is especially relevant when banking sites, as a category, are excluded.

By validating both the server certificate and the domain name in the Client Hello before applying an exclusion policy, SonicOS can reject untrusted sites and potentially block a type of zero-day attack from taking place. The SonicOS implementation takes the "trust-but-verify" approach to ensure that a domain name that matches the exclusion policy criteria is validated first, thus preventing an unsuspecting client from phishing or URL-redirect-related attacks.

ⓘ **IMPORTANT:** If you are excluding alternate domains in the Subject-Alternate-Name extension, it is recommended that you enable this option.

ⓘ **TIP:** If you enable this option, use the **Skip CFS Category-based Exclusion** option (see *Excluding/Including Common Names*) to exclude a particular domain or domains from this global authenticate option. This is useful to override any server authentication-related failures of trusted sites.

11. Click Accept.

## Enabling DPI-SSL Client on a Zone

***To enable DPI-SSL Client on a zone:***

1. Navigate to **OBJECT | Match Objects > Zones**.
2. Click the **Edit** icon for the zone to be configured. The Edit Zone dialog displays.
3. Select **Enable SSL Client Inspection**. This option is not selected by default.
4. Finish configuring the zone.
5. Click **OK**.
6. Repeat Step 2 through Step 5 for each zone on which to enable DPI-SSL client inspection.

## Enabling DPI-SSL Server on a Zone

***To enable DPI-SSL Server on a zone:***

1. Navigate to Navigate to **POLICY | DPI-SSL > Server SSL**.

ⓘ | **TIP:** For information about configuring DPI-SSL servers, see *Configuring DPI-SSL/TLS Server Settings*.

2. Select **Enable SSL Server Inspection**. This option is not selected by default.
3. Select one or more types of inspection.
4. Click **ACCEPT**.
5. Navigate to **OBJECT | Match Objects > Zones**.
6. Click the **Edit** icon for the zone to be configured. The Edit Zone dialog displays.
7. Select **Enable SSL Server Inspection**. This option is not selected by default.
8. Finish configuring the zone.
9. Click **OK**.
10. Repeat Step 6 through Step 8 for each zone on which to enable DPI-SSL server inspection

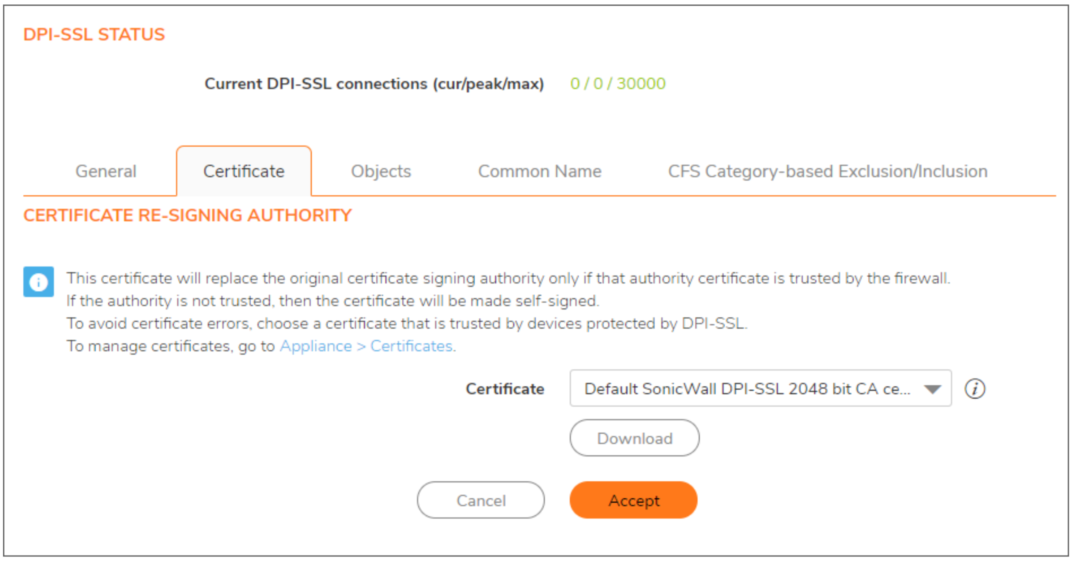
# Selecting the Re-Signing Certificate Authority

The re-signing certificate replaces the original certificate signing authority only if that authority certificate is trusted by the firewall. If the authority is not trusted, then the certificate is self-signed. To avoid certificate errors, choose a certificate that is trusted by devices protected by DPI-SSL.

ⓘ | **NOTE:** For information about requesting/creating a DPI SSL Certificate Authority (CA) certificate, see the Knowledge Base article, How to request/create DPI-SSL Certificate Authority (CA) certificates for the purpose of DPI-SSL certificate resigning (SW14090).

***To select a re-signing certificate:***

1. Navigate to the **POLICY | DPI-SSL > Client SSL** page.
2. Click **Certificate**.


DPI-SSL STATUS

Current DPI-SSL connections (cur/peak/max) 0 / 0 / 30000

CERTIFICATE RE-SIGNING AUTHORITY

This certificate will replace the original certificate signing authority only if that authority certificate is trusted by the firewall.
If the authority is not trusted, then the certificate will be made self-signed.
To avoid certificate errors, choose a certificate that is trusted by devices protected by DPI-SSL.
To manage certificates, go to Appliance > Certificates.

Certificate: Default SonicWall DPI-SSL 2048 bit CA ce...

3. Select the certificate to use from the **Certificate** drop-down menu. By default, DPI-SSL uses the Default SonicWall DPI-SSL CA certificate to re-sign traffic that has been inspected.

   ⓘ **NOTE:** If the certificate you want is not listed, you can import it from the **DEVICE | Settings > Certificates** page.

4. To download the selected certificate to the firewall, click the **(download)** link. The **Opening *filename*** dialog appears.

   ⓘ **TIP:** To view available certificates, click on the **(Manage Certificates)** link to display the **DEVICE | Settings > Certificates** page.

   a. Ensure the **Save File** radio button is selected.

   b. Click **OK**.

The file is downloaded.

5. Click **Accept**.

## Adding Trust to the Browser

For a re-signing certificate authority to successfully re-sign certificates, browsers have to trust the certificate authority. Such trust can be established by having the re-signing certificate imported into the browser's trusted CA list. Follow your browser’s instructions for importing re-signing certificates.

# Configuring Exclusions and Inclusions

By default, when DPI-SSL is enabled, it applies to all traffic on the appliance. You can customize to which traffic DPI-SSL inspection applies:

- **Exclusion/Inclusion** lists exclude/include specified objects and groups
- **Common Name** exclusions excludes specified host names
- **CFS Category-based Exclusion/Inclusion** excludes or includes specified categories based on CFS categories

This customization allows individual exclusion/inclusion of alternate names for a domain that is part of a list of domains supported by the same server (certificate). In deployments that process a large amount of traffic, to reduce the CPU impact of DPI-SSL and to prevent the appliance from reaching the maximum number of concurrent DPI-SSL inspected connections, it can be useful to exclude trusted sources.

> ⓘ **NOTE:** If DPI-SSL is enabled on the firewall when using Google Drive, Apple iTunes, or any other application with pinned certificates, the application may fail to connect to the server. To allow the application to connect, exclude the associated domains from DPI-SSL; for example, to allow Google Drive to work, exclude:
>
> ```
> .google.com
> .googleapis.com
> .gstatic.com
> ```
>
> As Google uses one certificate for all its applications, excluding these domains allows Google applications to bypass DPI-SSL.
>
> Alternatively, exclude the client machines from DPI-SSL.

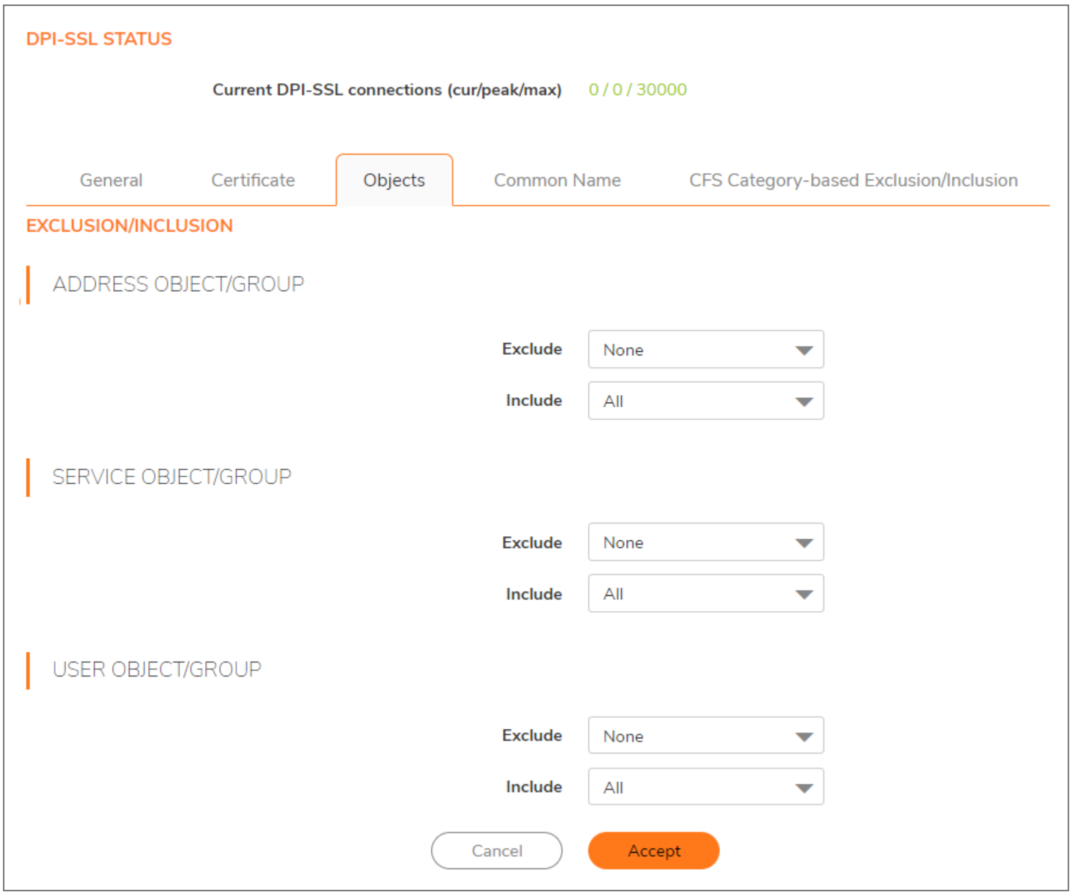
**Topics:**

- Excluding/Including Objects/Groups
- Excluding/Including by Common Name
- Specifying CFS Category-based Exclusions/Inclusions
- Content Filtering
- App Rules

## Excluding/Including Objects/Groups

***To customize DPI-SSL client inspection:***

1. Navigate to the **POLICY | DPI-SSL > Client SSL** page.
2. Click **Objects**.



DPI-SSL STATUS

Current DPI-SSL connections (cur/peak/max) 0 / 0 / 30000

EXCLUSION/INCLUSION

ADDRESS OBJECT/GROUP

Exclude: None

Include: All

SERVICE OBJECT/GROUP

Exclude: None

Include: All

USER OBJECT/GROUP

Exclude: None

Include: All

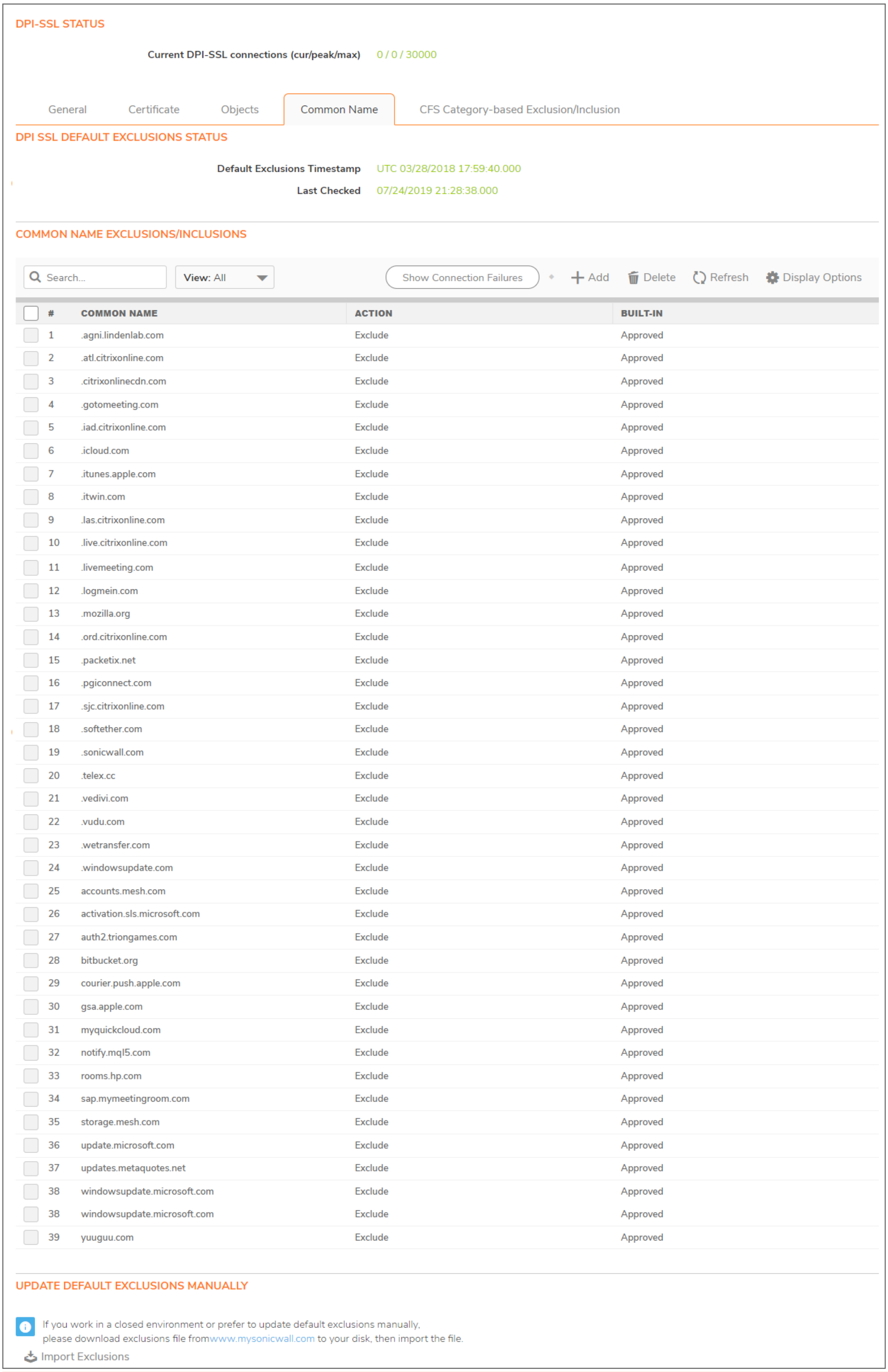
3. From the **Address Object/Group Exclude** and **Include** drop-down menus, select an address object or group to exclude or include from DPI-SSL inspection. By default, **Exclude** is set to **None** and **Include** is set to **All**.

   ⓘ **TIP:** The **Include** drop-down menu can be used to fine tune the specified exclusion list. For example, by selecting the **Remote-office-California** address object in the **Exclude** drop-down menu and the **Remote-office-Oakland** address object in the **Include** drop-down menu.

4. From the **Service Object/Group Exclude** and **Include** drop-down menus, select an address object or group to exclude or include from DPI-SSL inspection. By default, **Exclude** is set to **None** and **Include** is set to **All**.
5. From the **User Object/Group Exclude** and **Include** drop-down menus, select an address object or group to exclude or include from DPI-SSL inspection. By default, **Exclude** is set to **None** and **Include** is set to **All**.
6. Click **Accept**.

## Excluding/Including by Common Name

You can add trusted domain names to the exclusion list. Adding trusted domains to the Built-in exclusion database reduces the CPU effect of DPI-SSL and prevents he appliance from reaching the maximum number of concurrent DPI-SSL inspected connections.



DPI-SSL STATUS

Current DPI-SSL connections (cur/peak/max) 0 / 0 / 30000

DPI SSL DEFAULT EXCLUSIONS STATUS

Default Exclusions Timestamp UTC 03/28/2018 17:59:40.000

Last Checked 07/24/2019 21:28:38.000

COMMON NAME EXCLUSIONS/INCLUSIONS

| □ | # | COMMON NAME | ACTION | BUILT-IN |
|---|---|---|---|---|
| □ | 1 | .agni.lindenlab.com | Exclude | Approved |
| □ | 2 | .atl.citrixonline.com | Exclude | Approved |
| □ | 3 | .citrixonlinecdn.com | Exclude | Approved |
| □ | 4 | .gotomeeting.com | Exclude | Approved |
| □ | 5 | .iad.citrixonline.com | Exclude | Approved |
| □ | 6 | .icloud.com | Exclude | Approved |
| □ | 7 | .itunes.apple.com | Exclude | Approved |
| □ | 8 | .itwin.com | Exclude | Approved |
| □ | 9 | .las.citrixonline.com | Exclude | Approved |
| □ | 10 | .live.citrixonline.com | Exclude | Approved |
| □ | 11 | .livemeeting.com | Exclude | Approved |
| □ | 12 | .logmein.com | Exclude | Approved |
| □ | 13 | .mozilla.org | Exclude | Approved |
| □ | 14 | .ord.citrixonline.com | Exclude | Approved |
| □ | 15 | .packetix.net | Exclude | Approved |
| □ | 16 | .pgiconnect.com | Exclude | Approved |
| □ | 17 | .sjc.citrixonline.com | Exclude | Approved |
| □ | 18 | .softether.com | Exclude | Approved |
| □ | 19 | .sonicwall.com | Exclude | Approved |
| □ | 20 | .telex.cc | Exclude | Approved |
| □ | 21 | .vedivi.com | Exclude | Approved |
| □ | 22 | .vudu.com | Exclude | Approved |
| □ | 23 | .wetransfer.com | Exclude | Approved |
| □ | 24 | .windowsupdate.com | Exclude | Approved |
| □ | 25 | accounts.mesh.com | Exclude | Approved |
| □ | 26 | activation.sls.microsoft.com | Exclude | Approved |
| □ | 27 | auth2.triongames.com | Exclude | Approved |
| □ | 28 | bitbucket.org | Exclude | Approved |
| □ | 29 | courier.push.apple.com | Exclude | Approved |
| □ | 30 | gsa.apple.com | Exclude | Approved |
| □ | 31 | myquickcloud.com | Exclude | Approved |
| □ | 32 | notify.mql5.com | Exclude | Approved |
| □ | 33 | rooms.hp.com | Exclude | Approved |
| □ | 34 | sap.mymeetingroom.com | Exclude | Approved |
| □ | 35 | storage.mesh.com | Exclude | Approved |
| □ | 36 | update.microsoft.com | Exclude | Approved |
| □ | 37 | updates.metaquotes.net | Exclude | Approved |
| □ | 38 | windowsupdate.microsoft.com | Exclude | Approved |
| □ | 38 | windowsupdate.microsoft.com | Exclude | Approved |
| □ | 39 | yuuguu.com | Exclude | Approved |

UPDATE DEFAULT EXCLUSIONS MANUALLY

If you work in a closed environment or prefer to update default exclusions manually, please download exclusions file fromwww.mysonicwall.com to your disk, then import the file.

**Topics:**

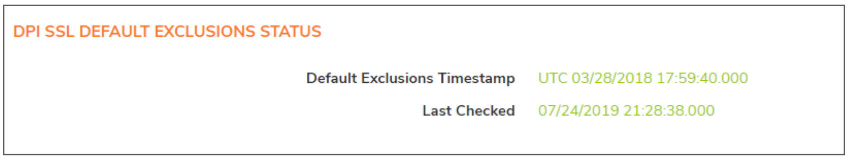
- Viewing Status of DPI SSL Default Exclusions
- Excluding/Including Common Names
- Deleting Custom Common Names
- Showing Connection Failures
- Updating Default Exclusions Manually

## Viewing Status of DPI SSL Default Exclusions

The firewall periodically checks for updates to the DPI SSL default exclusions database on MySonicWall and displays the latest status of the database in the DPI SSL Default Exclusions Status section. You can update the database on the firewall manually, as described in *Updating Default Exclusions Manually*.

***To view the status of default exclusions:***

1. Navigate to **POLICY | DPI-SSL > Client Server**.
2. Click **Common Name**.
3. Scroll to **DPI SSL Default Exclusions Status**.



DPI SSL DEFAULT EXCLUSIONS STATUS

Default Exclusions Timestamp UTC 03/28/2018 17:59:40.000

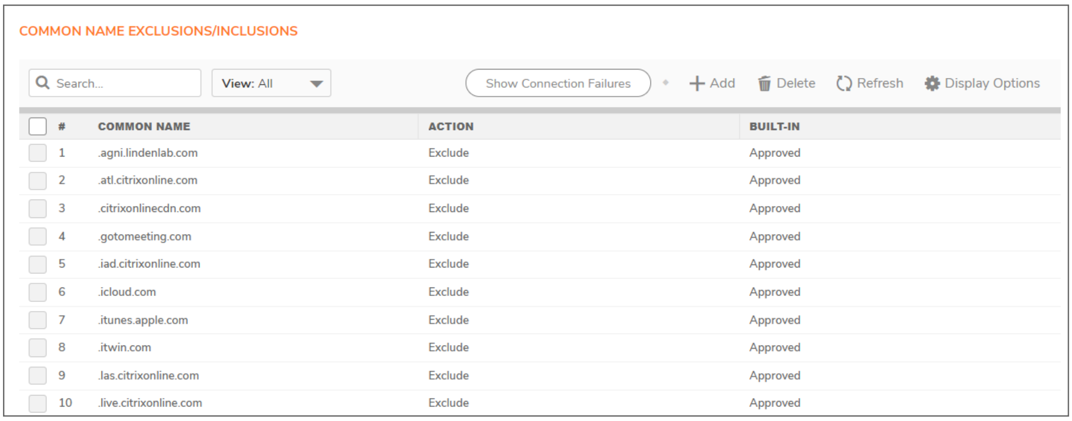
Last Checked 07/24/2019 21:28:38.000

| | |
|---|---|
| **Default Exclusions Timestamp** | Date and time the default exclusions database was updated. |
| **Last Checked** | Date and time the firewall checked the default exclusions database. |

## Excluding/Including Common Names

***To exclude/include entities by common name:***

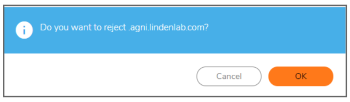
1. Navigate to the **POLICY | DPI-SSL > Client SSL** page.
2. Click **Common Name**.
3. Scroll to **Common Name: Exclusions/Inclusions**.



COMMON NAME EXCLUSIONS/INCLUSIONS

| □ # | COMMON NAME | ACTION | BUILT-IN |
|---|---|---|---|
| □ 1 | .agni.lindenlab.com | Exclude | Approved |
| □ 2 | .atl.citrixonline.com | Exclude | Approved |
| □ 3 | .citrixonlinecdn.com | Exclude | Approved |
| □ 4 | .gotomeeting.com | Exclude | Approved |
| □ 5 | .iad.citrixonline.com | Exclude | Approved |
| □ 6 | .icloud.com | Exclude | Approved |
| □ 7 | .itunes.apple.com | Exclude | Approved |
| □ 8 | .itwin.com | Exclude | Approved |
| □ 9 | .las.citrixonline.com | Exclude | Approved |
| □ 10 | .live.citrixonline.com | Exclude | Approved |

4. You can control the display of the common names by selecting the following options:
   - **View** options:
     - **All** – Displays all common names.
     - **Default** – Displays the default common names (excludes **Custom**).
     - **Custom** – Displays only common names you have added.
5. By default, all Built-in common names are approved. You can reject the approval of a Built-in common name by:
   a. Clicking the **Reject this built-in name** icon in the **Configure** column for the common name. A confirmation message displays.

   
   Do you want to reject .agni.lindenlab.com?

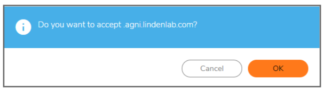
   b. Click **OK**.

The **Reject** icon becomes an **Accept** icon, and **Approved** in the **Built-in** column becomes **Rejected**.

ⓘ | **TIP:** Built-in common names cannot be modified or deleted, but you can reject or accept them.

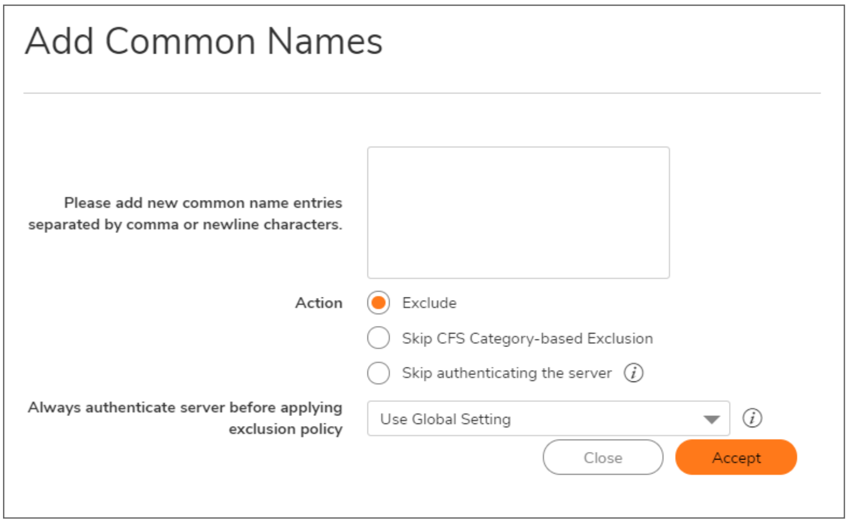
***To accept a rejected Built-in common name:***

a. Click its **Accept this built in name** icon. A confirmation message displays.


Do you want to accept .agni.lindenlab.com?

b. Click **OK**.

6. To add a custom common name, click **+Add**. The **Add Common Names** dialog displays.



Add Common Names

Please add new common name entries separated by comma or newline characters.

Action
● Exclude
○ Skip CFS Category-based Exclusion
○ Skip authenticating the server

Always authenticate server before applying exclusion policy: Use Global Setting

   a. Add one or more common names in the field. Separate multiple entries with commas or newline characters.

   b. Specify the type of **Action**:

      - **Exclude** (default)
      - **Skip CFS Category-based Exclusion**
      - **Skip authenticating the server** to opt out of authenticating the server for this domain if doing so results in the connection being blocked. Enable this option only if the server is a trusted domain.

   c. DPI-SSL dynamically determines if a connection should be intercepted (included) or excluded, based on policy or configuration. When DPI-SSL extracts the domain name for the connection, exclusion information is readily available for subsequent connections to the same server/domain.

      To **Enable** or **Disable** use of dynamic exclusion cache (both server IP and common-name based), select an option from the **Always authenticate server before applying exclusion policy** drop-down menu. **Use Global Setting** is selected by default.

   d. Click **Accept**.

      The **Common Name Exclusions/Inclusions** table is updated, with **Custom** in the **Built-in** column. If the **Always authenticate server before applying exclusion policy** option has been selected, an **Information** icon displays next to **Custom** in the **Built-in** column.

      Mouse over the Information icon to see which custom attributes were selected. If a common name was added through the **Connection Failure List**, the Information icon indicates the type of failure:

      - **Skip CFS category exclusion**
      - **Skip Server authentication**
      - **Failed to authenticate server**
      - **Failed Client handshake**
      - **Failed Server handshake**

      To delete the entry, click the **Delete** icon in the **Configure** column.

7. You can search for common names by specifying a filter.

    a. In the **Filter** field, enter a name by specifying the name in this syntax: name:mycommonname.
    b. Click **Filter**.

8. Click **Accept**.

## Deleting Custom Common Names

***To delete custom common names:***

1. Do one of the following:
    - Clicking a custom common name's **Delete** icon in the **Configure** column.
    - Selecting the name in the **Exclusions**, and then clicking **Delete**.
    - Clicking **Delete All** to delete all custom common names. A confirmation message displays. Click **OK**.
2. Click **Accept**.

## Showing Connection Failures

SonicOS keeps a list of recent DPI-SSL client-related connection failures. This is a powerful feature that:

- Lists DPI-SSL failed connections.
- Allows you to audit the failed connections.
- Provide a mechanism to automatically exclude some failing domains.

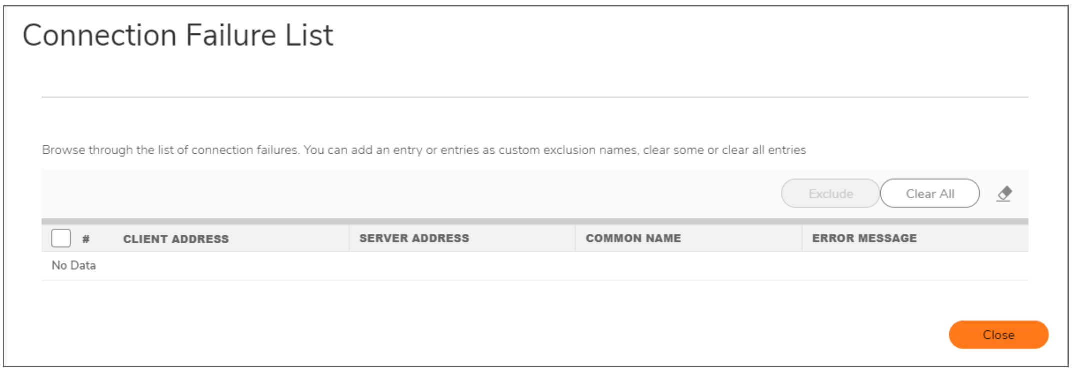
The dialog displays the run-time connection failures. The connection failures could be any of the following reasons:

- Failure to handshake with the Client
- Failure to handshake with the Server
- Failed to validate the domain name in the Client Hello
- Failure to authenticate the server (the server certificate issuer is not trusted)

The failure list is only available at run-time. The number logged for each failure is limited to ensure a single failure type does not overrun the entire buffer.

***To use the connection failure list:***

1. Click **Show Connection Failures**. The **Connection Failure List** dialog displays.



Connection Failure List

Browse through the list of connection failures. You can add an entry or entries as custom exclusion names, clear some or clear all entries

| □ | # | CLIENT ADDRESS | SERVER ADDRESS | COMMON NAME | ERROR MESSAGE |
|---|---|---|---|---|---|
| No Data | | | | | |

Each entry in this lists displays the:

- **Client Address**
- **Server Address**
- **Common Name** – The common name of the failed connection’s domain. You can edit this entry inline before adding it to the automatic exclusion list.
- **Error Message** – Provides contextual information associated with the connection that enables you to make appropriate choices about excluding this connection.

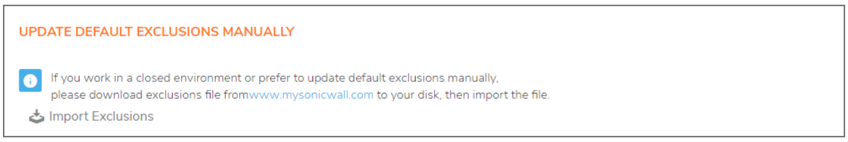
2. To add an entry to the exclusion list:
   a. Select the entry.
   b. Make any edits to the entry.
   c. Click **Exclude**.
3. To delete an entry:
   a. Select it.
   b. Click **Clear**.
4. To delete all entries, click **Clear All**.
5. When you have finished, click **Close**.

## Updating Default Exclusions Manually

If your environment is closed or you prefer to update default exclusions manually, you can download the default exclusions database from www.MySonicWall.com and then import them.

***To update default exclusions manually:***

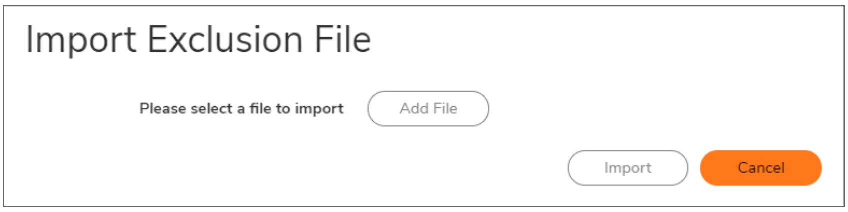
1. Import the default exclusions database from www.MySonicWall.com.
2. Navigate to the **POLICY | DPI-SSL > Client SSL** page.
3. Scroll to the **Update Default Exclusions Manually** section.



UPDATE DEFAULT EXCLUSIONS MANUALLY

If you work in a closed environment or prefer to update default exclusions manually, please download exclusions file fromwww.mysonicwall.com to your disk, then import the file.

4. Click **IMPORT EXCLUSIONS**. The **Import Exclusion File** dialog displays.



Import Exclusion File

Please select a file to import

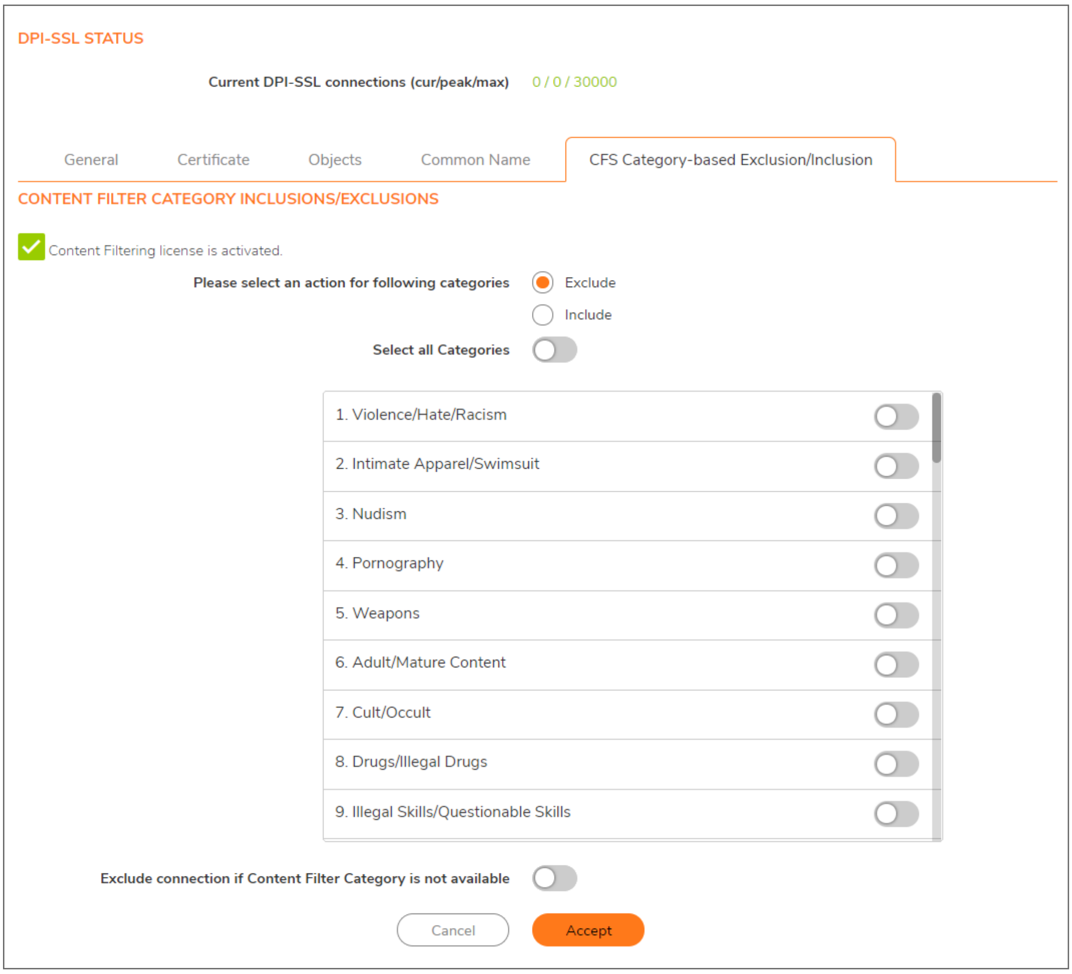
5. Click **Add File**. The **File Upload** dialog displays.
6. Open the downloaded default exclusions database file.
7. The **Common Name Exclusions/Inclusions** table and the status of the default database used by the firewall in the DPI SSL Default Exclusions Status section are updated.

# Specifying CFS Category-based Exclusions/Inclusions

You can exclude/include entities by content filter categories.

***To specify CFS category-based exclusions/inclusions::***

1. Navigate to the **POLICY | DPI-SSL > Client SSL** page.
2. Click **CFS Category-based Exclusions/Inclusions**.



DPI-SSL STATUS

Current DPI-SSL connections (cur/peak/max) 0 / 0 / 30000

CONTENT FILTER CATEGORY INCLUSIONS/EXCLUSIONS

✓ Content Filtering license is activated.

Please select an action for following categories ● Exclude ○ Include

Select all Categories ○

1. Violence/Hate/Racism ○
2. Intimate Apparel/Swimsuit ○
3. Nudism ○
4. Pornography ○
5. Weapons ○
6. Adult/Mature Content ○
7. Cult/Occult ○
8. Drugs/Illegal Drugs ○
9. Illegal Skills/Questionable Skills ○

Exclude connection if Content Filter Category is not available ○

The status of the list is shown by an icon at the top of the view. A green icon indicates Content Filtering is licensed, a red icon that it is not.

3. Choose whether you want to include or exclude the selected categories by clicking either:
   - **Exclude** (default)
   - **Include**

   By default, all categories are unselected.
4. Optionally, repeat Step 3 and Step 4 to create the opposite list.
5. Select the categories to be included/excluded. To select all categories, click **Select all Categories**.
6. Optionally, to exclude a connection if the content filter category information for a domain is not available to DPI-SSL, select the **Exclude connection if Content Filter Category** is not available

checkbox. This option is not selected by default.

In most cases, category information for a HTTPS domain is available locally in the firewall cache. When the category information is not locally available, DPI-SSL obtains the category information from the cloud without blocking the client or server communication. In rare cases, the category information is not available for DPI-SSL to make a decision. By default, such sites are inspected in DPI-SSL.

7. Click **Accept**.

# Client DPI-SSL Examples

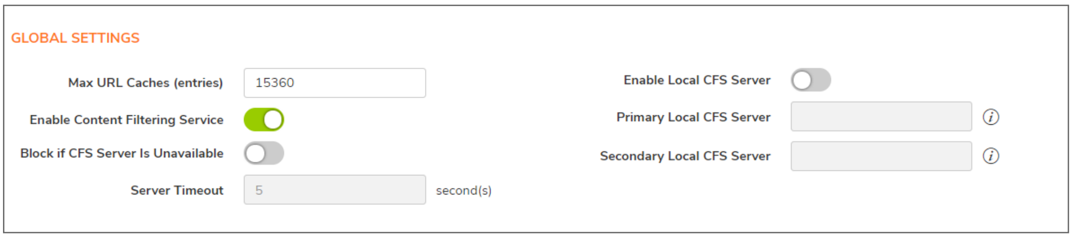
**Topics:**

- Content Filtering
- App Rules

## Content Filtering

***To perform SonicWall Content Filtering on HTTPS and SSL-based traffic using DPI-SSL:***

1. Navigate to **POLICY | Security Services > Content Filter**.
2. Ensure SonicWall CFS is selected for the Content Filter Type from the drop-down menu.
3. Scroll to the **Global Settings** section.



GLOBAL SETTINGS

Max URL Caches (entries) 15360

Enable Content Filtering Service ●

Block if CFS Server Is Unavailable ○

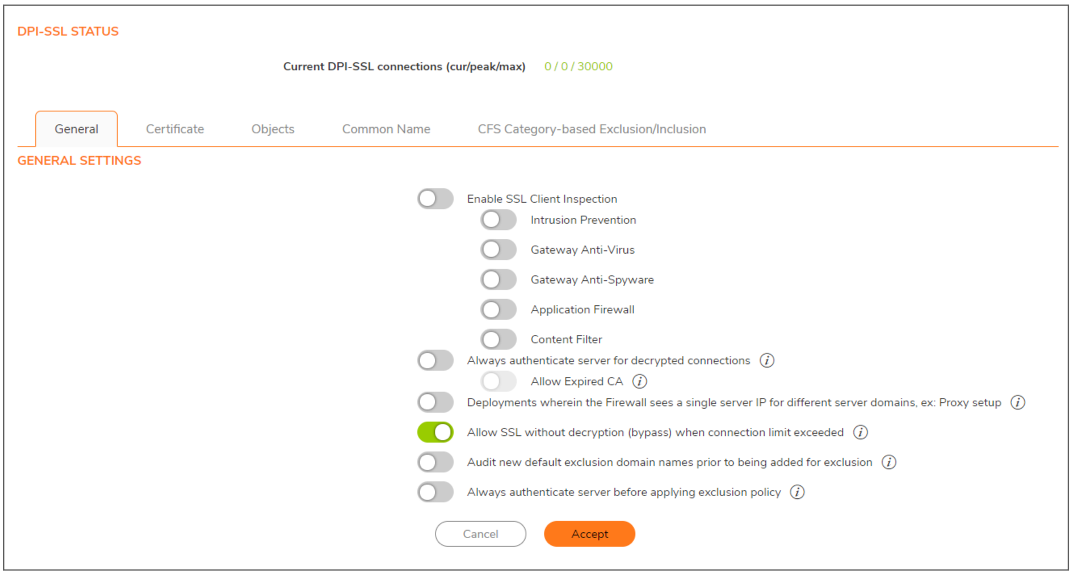
Server Timeout 5 second(s)

Enable Local CFS Server ○

Primary Local CFS Server

Secondary Local CFS Server

4. Select **Enable Content Filtering Service**.
5. Click **Accept**.
6. Navigate to the **POLICY | DPI-SSL > Client SSL** page.
7. Click **General**.



DPI-SSL STATUS

Current DPI-SSL connections (cur/peak/max) 0 / 0 / 30000

GENERAL SETTINGS

○ Enable SSL Client Inspection
- ○ Intrusion Prevention
- ○ Gateway Anti-Virus
- ○ Gateway Anti-Spyware
- ○ Application Firewall
- ○ Content Filter

○ Always authenticate server for decrypted connections ⓘ
- ○ Allow Expired CA ⓘ

○ Deployments wherein the Firewall sees a single server IP for different server domains, ex: Proxy setup ⓘ

● Allow SSL without decryption (bypass) when connection limit exceeded ⓘ

○ Audit new default exclusion domain names prior to being added for exclusion ⓘ

○ Always authenticate server before applying exclusion policy ⓘ

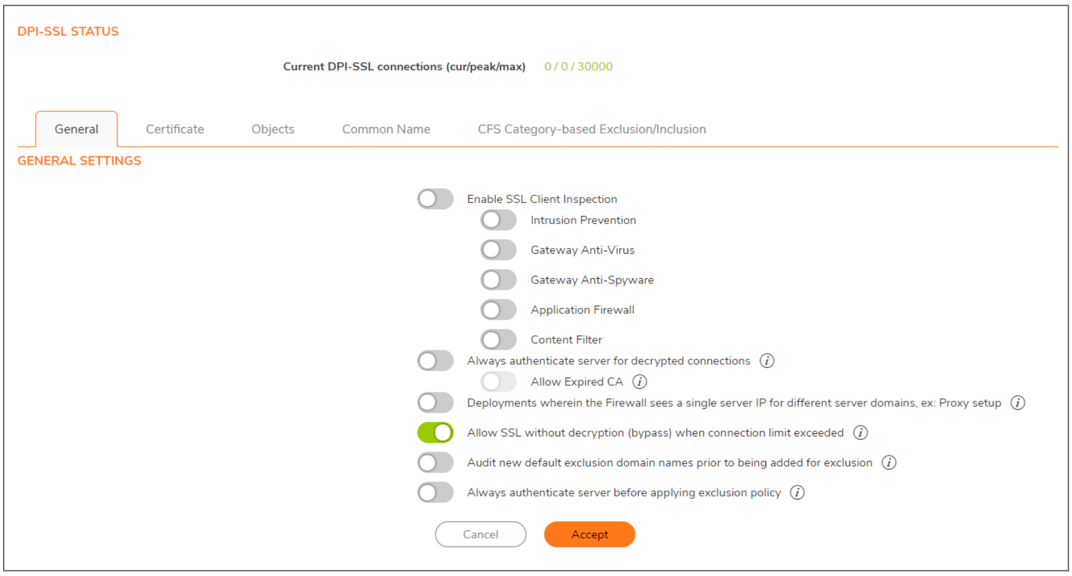
8. Select the **Enable SSL Inspection** checkbox.
9. Select the **Content Filter** checkbox.
10. Click **Accept**.
11. Navigate to a blocked site using the HTTPS protocol to verify that it is properly blocked.

> ⓘ **NOTE:** For content filtering over DPI-SSL, the first time HTTPS access is blocked results in a blank page being displayed. If the page is refreshed, the user sees the firewall block page.

## App Rules

To filter by application firewall rules, you need to enable them on both the **POLICY | DPI-SSL > Client SSL** page and the **POLICY | Rules and Policies > App Control** page.

1. Navigate to the **POLICY | DPI-SSL > Client SSL** page.
2. Click **General**.



DPI-SSL STATUS

Current DPI-SSL connections (cur/peak/max) 0 / 0 / 30000

GENERAL SETTINGS

○ Enable SSL Client Inspection
- ○ Intrusion Prevention
- ○ Gateway Anti-Virus
- ○ Gateway Anti-Spyware
- ○ Application Firewall
- ○ Content Filter

○ Always authenticate server for decrypted connections ⓘ
- ○ Allow Expired CA ⓘ

○ Deployments wherein the Firewall sees a single server IP for different server domains, ex: Proxy setup ⓘ

● Allow SSL without decryption (bypass) when connection limit exceeded ⓘ

○ Audit new default exclusion domain names prior to being added for exclusion ⓘ

○ Always authenticate server before applying exclusion policy ⓘ

3. Select the **Enable SSL Client Inspection** checkbox.
4. Select the **Application Firewall** checkbox.
5. Click **Accept**.
6. Navigate to **POLICY | Rules and Policies > App Control** page.
7. Scroll to the **App Rules Global Settings** section.
8. Select **Enable App Control**. This option is not selected by default.
9. Configure an HTTP Client policy to block Microsoft Internet Explorer browser with block page as an action for the policy.
10. Click **Accept**.
11. Access any website using the HTTPS protocol with Internet Explorer to verify it is blocked.

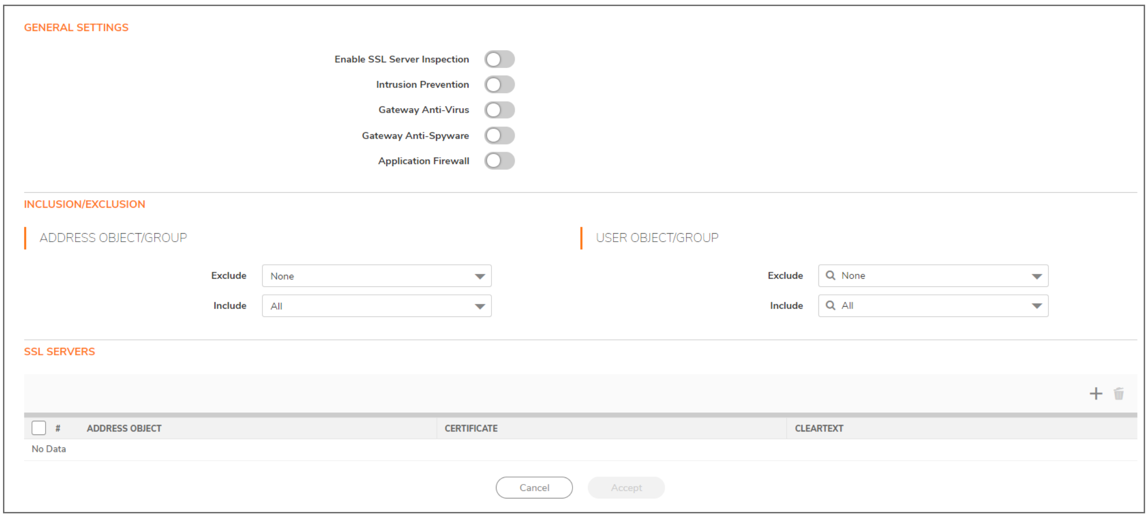
3

# Configuring DPI-SSL/TLS Server Settings

**Topics:**

- Decryption Services > DPI-SSL/TLS Server
- About DPI-SSL/TLS Server Settings

## Decryption Services > DPI-SSL/TLS Server



GENERAL SETTINGS

- Enable SSL Server Inspection ○
- Intrusion Prevention ○
- Gateway Anti-Virus ○
- Gateway Anti-Spyware ○
- Application Firewall ○

INCLUSION/EXCLUSION

ADDRESS OBJECT/GROUP

| | |
|---|---|
| Exclude | None |
| Include | All |

USER OBJECT/GROUP

| | |
|---|---|
| Exclude | None |
| Include | All |

SSL SERVERS

| □ # | ADDRESS OBJECT | CERTIFICATE | CLEARTEXT |
|---|---|---|---|
| No Data | | | |

ⓘ | **NOTE:** For information about DPI SSL, see About DPI-SSL.

The Server DPI-SSL deployment scenario is typically used to inspect HTTPS traffic when remote clients connect over the WAN to access content located on the firewall's LAN. Server DPI-SSL allows you to configure pairings of an address object and certificate. When the appliance detects SSL connections to the address object, it presents the paired certificate and negotiates SSL with the connecting client.

Afterward, if the pairing defines the server to be cleartext, then a standard TCP connection is made to the server on the original (post NAT remapping) port. If the pairing is not defined to be cleartext, then an SSL connection to the server is negotiated. This allows for end-to-end encryption of the connection.

> **NOTE:** In this deployment scenario, the owner of the firewall owns the certificates and private keys of the origin content servers. You would have to import the server's original certificate onto the appliance and create an appropriate server IP address to server certificate mappings in the Server DPI-SSL UI.

# About DPI-SSL/TLS Server Settings

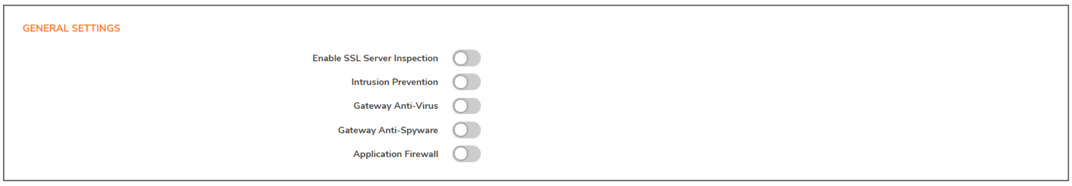
**Topics:**

- Configuring General DPI-SSL/TLS Server Settings
- Configuring Exclusions and Inclusions
- Configuring Server-to-Certificate Pairings

# Configuring General DPI-SSL/TLS Server Settings

***To enable Server DPI-SSL inspection:***

1. Navigate to the **POLICY | DPI-SSL > Server SSL** page.



GENERAL SETTINGS

Enable SSL Server Inspection ○
Intrusion Prevention ○
Gateway Anti-Virus ○
Gateway Anti-Spyware ○
Application Firewall ○

2. Scroll to the **General Settings** section.
3. Select **Enable SSL Server Inspection**.
4. Select one or more of the services with which to perform inspection:

- **Intrusion Prevention**
- Gateway Anti-Virus
- **Gateway Anti-Spyware**
- **Application Firewall**

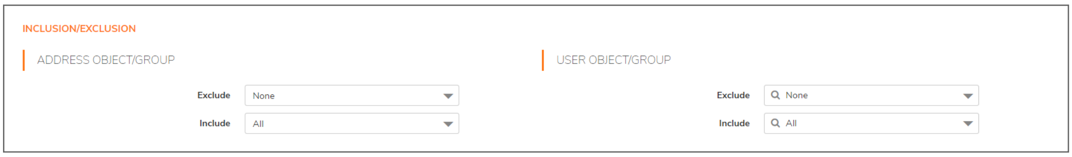
5. Click **Accept**.
6. Scroll down to the **SSL Servers** section to configure the server or servers to which DPI-SSL inspection is applied. See *Configuring Server-to-Certificate Pairings*.

# Configuring Exclusions and Inclusions

By default, the DPI-SSL applies to all traffic on the appliance when it is enabled. You can configure inclusion/exclusion lists to customize to which traffic DPI-SSL inspection applies. The **Inclusion/Exclusion** lists provide the ability to specify certain objects or groups. In deployments that process a large amount of traffic, to reduce the CPU impact of DPI-SSL and to prevent the appliance from reaching the maximum number of concurrent DPI-SSL inspected connections, it can be useful to exclude trusted sources.

### *To customize DPI-SSL server inspection:*

1. Navigate to the **POLICY | DPI-SSL > Server SSL** page.
2. Scroll to the **Inclusion/Exclusion** section.



INCLUSION/EXCLUSION

ADDRESS OBJECT/GROUP

Exclude: None

Include: All

USER OBJECT/GROUP

Exclude: None

Include: All

3. From **Address Object/Group Exclude**, select an address object or group to exclude from DPI-SSL inspection. By default, **Exclude** is set to **None**.
4. From **Address Object/Group Include**, select an address object or group to include in DPI-SSL inspection. By default, **Include** is set to **All**.

   ⓘ **TIP: Include** can be used to fine tune the specified exclusion list. For example, by selecting the **Remote-office-California** address object from **Exclude** and the **Remote-office-Oakland** address object from **Include**.

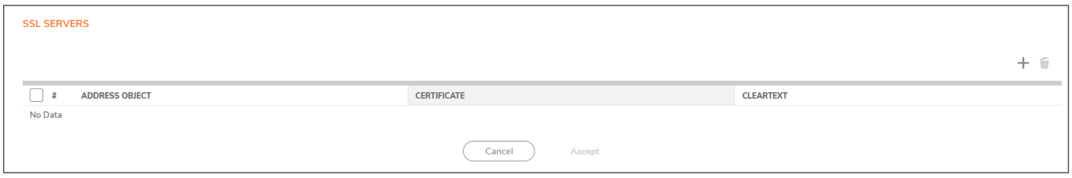
5. From **User Object/Group Exclude**, select an address object or group to exclude from DPI-SSL inspection. By default, **Exclude** is set to **None**.
6. From **User Object/Group Include**, select an address object or group to include in DPI-SSL inspection. By default, **Include** is set to **All**.
7. Click **Accept**.

# Configuring Server-to-Certificate Pairings

Server DPI-SSL inspection requires that you specify which certificate is used to sign traffic for each server that has DPI-SSL inspection performed on its traffic.

### *To configure a server-to-certificate pairing:*

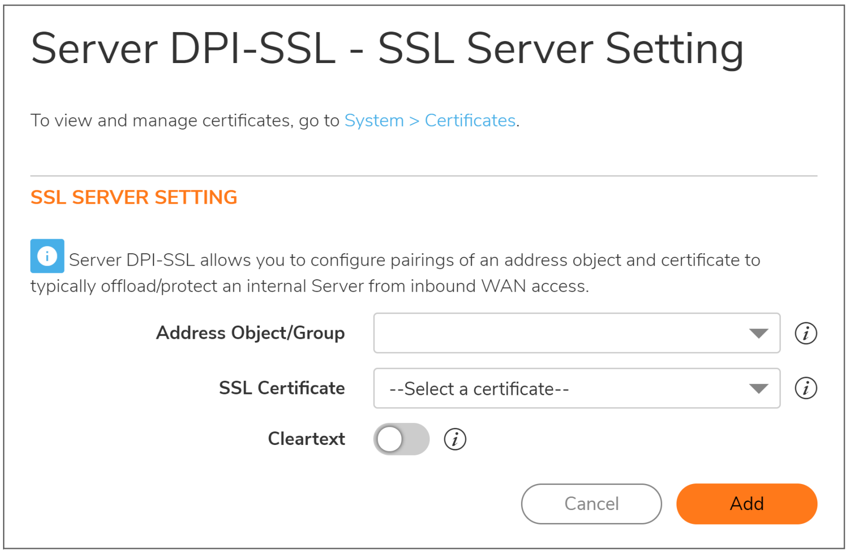
1. Navigate to the **POLICY | DPI-SSL > Server SSL** page.
2. Scroll to the **SSL Servers** section.



SSL SERVERS

| □ # | ADDRESS OBJECT | CERTIFICATE | CLEARTEXT |
|---|---|---|---|
| No Data | | | |

3. Click **+Add**. The **Server DPI-SSL - SSL Server Setting** dialog displays.



Server DPI-SSL - SSL Server Setting

To view and manage certificates, go to System > Certificates.

SSL SERVER SETTING

Server DPI-SSL allows you to configure pairings of an address object and certificate to typically offload/protect an internal Server from inbound WAN access.

Address Object/Group:

SSL Certificate: --Select a certificate--

Cleartext: off

4. From **Address Object/Group**, select the address object or group for the server or servers to which you want to apply DPI-SSL inspection.
5. From **SSL Certificate**, select the certificate to be used to sign the traffic for the server. This certificate is used to sign traffic for each server that has DPI-SSL Server inspection performed on its traffic. For more information on:

- Importing a new certificate to the appliance, see Selecting the Re-Signing Certificate Authority.
- **Creating a Linux certificate**.

  ⓘ **TIP:** Clicking the (`Manage Certificates`) link displays the **DEVICE | Settings > Certificates** page.

6. Select **Cleartext** to enable SSL offloading. When adding server-to-certificate pairs, the **Cleartext** option provides a method of sending unencrypted data onto a server. This option is not selected by default.

   ⓘ **IMPORTANT:** For such a configuration to work properly, a NAT policy needs to be created for this server on the **POLICY | Rules and Policies > NAT Rules** page to map traffic destined for the offload server from an SSL port to a non-SSL port. Traffic must be sent over a port other than 443. For example, for HTTPS traffic used with SSL offloading, an inbound NAT policy remapping traffic from port 443 to port 80 needs to be created for things to work properly.
7. Click **Add**.

4

# SonicWall Support

Technical support is available to customers who have purchased SonicWall products with a valid maintenance contract.

The Support Portal provides self-help tools you can use to solve problems quickly and independently, 24 hours a day, 365 days a year. To access the Support Portal, go to https://www.sonicwall.com/support.

The Support Portal enables you to:

- View knowledge base articles and technical documentation
- View and participate in the Community forum discussions at https://community.sonicwall.com/technology-and-support.
- View video tutorials
- Access https://mysonicwall.com
- Learn about SonicWall professional services
- Review SonicWall Support services and warranty information
- Register for training and certification
- Request technical support or customer service

To contact SonicWall Support, visit https://www.sonicwall.com/support/contact-support.

# About This Document

ⓘ | **NOTE:** A NOTE icon indicates supporting information.

ⓘ | **IMPORTANT:** An IMPORTANT icon indicates supporting information.

ⓘ | **TIP:** A TIP icon indicates helpful information.

△ | **CAUTION: A CAUTION icon indicates potential damage to hardware or loss of data if instructions are not followed.**

⚠ | **WARNING: A WARNING icon indicates a potential for property damage, personal injury, or death.**

SonicOS DPI-SSL Administration Guide
Updated - January 2021
Software Version - 7
232-005334-10 Rev B

The information in this document is provided in connection with SonicWall and/or its affiliates' products. No license, express or implied, by estoppel or otherwise, to any intellectual property right is granted by this document or in connection with the sale of products. EXCEPT AS SET FORTH IN THE TERMS AND CONDITIONS AS SPECIFIED IN THE LICENSE AGREEMENT FOR THIS PRODUCT, SONICWALL AND/OR ITS AFFILIATES ASSUME NO LIABILITY WHATSOEVER AND DISCLAIMS ANY EXPRESS, IMPLIED OR STATUTORY WARRANTY RELATING TO ITS PRODUCTS INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTY OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR NON-INFRINGEMENT. IN NO EVENT SHALL SONICWALL AND/OR ITS AFFILIATES BE LIABLE FOR ANY DIRECT, INDIRECT, CONSEQUENTIAL, PUNITIVE, SPECIAL OR INCIDENTAL DAMAGES (INCLUDING, WITHOUT LIMITATION, DAMAGES FOR LOSS OF PROFITS, BUSINESS INTERRUPTION OR LOSS OF INFORMATION) ARISING OUT OF THE USE OR INABILITY TO USE THIS DOCUMENT, EVEN IF SONICWALL AND/OR ITS AFFILIATES HAVE BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. SonicWall and/or its affiliates make no representations or warranties with respect to the accuracy or completeness of the contents of this document and reserves the right to make changes to specifications and product descriptions at any time without notice. and/or its affiliates do not make any commitment to update the information contained in this document.

For more information, visit https://www.sonicwall.com/legal.

## End User Product Agreement

To view the SonicWall End User Product Agreement, go to: https://www.sonicwall.com/legal/end-user-product-agreements/.

## Open Source Code

SonicWall Inc. is able to provide a machine-readable copy of open source code with restrictive licenses such as GPL, LGPL, AGPL when applicable per license requirements. To obtain a complete machine-readable copy, send your written requests, along with certified check or money order in the amount of USD 25.00 payable to "SonicWall Inc.", to:

General Public License Source Code Request
Attn: Jennifer Anderson
1033 McCarthy Blvd
Milpitas, CA 95035