Blue Coat® Systems

Deployment Guide

Deploying the SSL Proxy

For SGOS 5.1.4

Blue✪Coat®

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Document Number: 231-02909
Document Revision: SSL Proxy Deployment Guide—SGOS 5.1.4

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Introduction to the Blue Coat SSL Proxy

HTTPS traffic poses a major security risk to enterprises. Because SSL (Secure Socket Layer) content is encrypted, it can't be intercepted by normal means. Users can bring in viruses, access forbidden sites, and leak business confidential information over an HTTPS connection, which uses port 443.

Because IT organizations have no visibility into SSL sessions, they are blind to any potential security threats sent over HTTPS.

In addition to the security threat, encrypted traffic makes it difficult for IT to assess bandwidth usage and apply intelligent content control policies to ensure maximum user productivity.

Prior to the SSL Proxy, the only solution for managing HTTPS traffic was to deny HTTPS altogether or severely limit its usage.

What the SSL Proxy Does

HTTPS traffic is the same as HTTP traffic except that it is encapsulated so that the content is hidden.

The SSL Proxy can be used to tunnel or intercept HTTPS traffic. The SSL Proxy tunnels all HTTPS traffic by default unless there is an exception, such as a certificate error or a policy denial. In such cases the SSL Proxy intercepts the SSL connection and sends an error page to the user. The SSL Proxy allows interception of HTTPS traffic even when there are no errors. Such interception enables the application of various security policies to HTTPS content.

Some HTTPS traffic, such as financial information, should not be intercepted. The SSL proxy can do the following operations while tunneling HTTPS traffic.

❒ Validate server certificates, including revocation checks using Certificate Revocation Lists (CRLs).

❒ Check various SSL parameters such as cipher and version.

❒ Log useful information about the HTTPS connection.

When the SSL Proxy is used to intercept HTTPS traffic, it can also:

❒ Cache HTTPS content.

❒ Apply HTTP-based authentication mechanism.

❐ Do virus scanning and URL filtering.

❐ Apply granular policy (such as validating mime type and filename extension).

The Blue Coat SSL proxy allows you to:

❐ Determine what HTTPS traffic to intercept through existing policy conditions, such as destination IP address and port number. You can also use the hostname in the server certificate to make the intercept versus tunnel decision.

❐ Validate the server certificate to confirm the identity of the server, and check Certificate Revocation Lists (CRLs) to be sure the server certificate has not been revoked.

❐ Apply caching, virus scanning and URL filtering policies to intercepted HTTPS traffic.

Increasing Control

The SSL proxy allows you to increase control by:

❐ Distinguishing between SSL and non-SSL traffic on the same port.

❐ Distinguishing HTTPS from other protocols over SSL.

❐ Categorizing sites by their SSL server certificate hostname.

❐ Security is increased through:

- Server certificate validation, including checking CRLs.

- Virus scanning and URL filtering of HTTPS content.

Visibility and improved system performance is due to SSL logs and caching (which is enabled by default when using the SSL proxy).

SSL Proxy Overview

SSL and tunneling protocols are closely tied together. To understand SSL, you must first understand how tunneling applications work.

This chapter discusses:

Understanding SSL

At the lowest level, SSL is layered on top of TCP/IP. SSL uses the SSL Handshake Protocol to allow the server and client to authenticate each other and to negotiate the encryption cipher before the application protocol transmits or receives its first byte of data.

 SSL has emerged as the de facto standard protocol for establishing a secure, encrypted link between a remote application server and the client Web browser on the local user's desktop.

SSL is a proven technology with strong appeal to IT organizations because each secure session link is automatically established "on demand" using standards-based protocols, encryption techniques, and certificate exchange – all without the need for any IT administration.

The process of setting up the private connection is automatically initiated by the server communicating directly with the browser. The result is a private, encrypted tunnel used to move information between the server and client desktop. When the session is over, the connection is automatically terminated.

However, SSL sessions are rapidly becoming a conduit for a variety of enterprise security threats – including spyware, viruses, worms, phishing, and other malware.

Using an SSL Proxy for Privacy, Authentication, and Data Integrity

The SSL proxy can manage the SSL sessions in such a way as to prevent enterprise security threats while at the same time allowing you to determine the level of control.

If the HTTPS traffic contains financial information, you probably do not want to intercept that traffic.

However, many other kinds of traffic should and can be intercepted by the SSL proxy.

Determining What HTTPS Traffic to Intercept

The default mode of operation for the SSL Proxy is to intercept HTTPS traffic only if there is an exception, such as a certificate error. It tunnels all HTTPS traffic otherwise..

To intercept HTTPS traffic for reasons other than error reporting many existing policy conditions, such as destination IP address and port number, can be used.

Additionally, the SSL proxy allows the hostname in the server certificate to be used to make the decision to intercept or tunnel the traffic. The server certificate hostname can be used as is to make intercept decisions for individual sites, or it can be categorized using any of the various URL databases supported by Blue Coat. Categorization of server certificate hostnames can help place the intercept decision for various sites into a single policy rule.

Recommendations for intercepting traffic include:

❐ Intercept Intranet traffic.

❐ Intercept suspicious Internet sites, particularly those that are categorized as none in the server certificate.

❐ Intercept sites that provide secure web based e-mail, such as Gmail over HTTPS.

Managing Decrypted Traffic

After the HTTPS connection is intercepted, you can do:

❐ Anti-virus scanning over ICAP.

❐ URL filtering (on box and off-box). Blue Coat recommends on box URL/ Content filtering if you use transparent proxy. When the URL is sent off-box for filtering, only the hostname or IP address of the URL (not the full path) is sent for security reasons.

❑ Filtering based on the server certificate hostname.

❑ Caching.

HTTPS applications that require browsers to present client certificates to secure Web servers do not work if you are intercepting traffic. Such applications should not be intercepted by creating a policy rule.

If you intercept HTTPS traffic, be aware that local privacy laws might require you to notify the user about interception or obtain consent prior to interception. You can use the HTML Notify User object to notify users after anticipation. You can use consent certificates to obtain consent prior to interception. The HTML Notify User is easier; however, note that the SG appliance has to decrypt the first request from the user before it can issue an HTML notification page.

Digital Certificates and Certificate Authorities

Server certificates are used to authenticate the identity of a server. A certificate is an electronic confirmation that the owner of a public key is who he or she really claims to be and thus holds the private key corresponding to the public key in the certificate. The certificate contains other information, such as its expiration date.

The association between a public key and a particular server is done by generating a certificate signing request using the server's public key. A certificate signing authority verifies the identity of the server and generates a signed certificate. The resulting certificate can then be offered by the server to clients who can recognize the CA's signature and trust that the server is who it claims to be. Such use of certificates issued by CAs has become the primary infrastructure for authentication of communications over the Internet.

SG appliances come with many popular CA certificates already installed. You can review these certificates using the Management Console or the CLI. You can also add certificates for your own internal certificate authorities.

SG appliances trust all root CA certificates trusted by Internet Explorer and Firefox. The list is updated periodically to be in sync with the latest versions of IE and Firefox.

CA certificates installed on the SG appliance are used to verify the certificates presented by HTTPS servers and the client certificates presented by browsers (when browsers are configured to do so).

Certificate Revocation Lists (CRLs) allow checking server certificates against lists provided and maintained by CAs that show certificates that have been revoked.

SSL Proxy Versus HTTPS Reverse Proxy

Depending on your needs, you can use the SG appliance as either an SSL proxy or an HTTPS reverse proxy. SSL proxy functionality enables the SG appliance to act as forward proxy for HTTPS requests.

❒   An SSL proxy is a client-side proxy typically used for applying security and performance features such as authentication, URL filtering, and caching.

❒   An HTTPS reverse proxy is a server-side proxy typically used to offload SSL processing from server to the proxy. Reverse proxies are deployed in proximity to the server. The communication between the HTTPS reverse proxy and server might or might not use SSL. The SG appliance can be used as an HTTPS reverse proxy with the help of the existing HTTPS Reverse Proxy service. Performance is usually the only objective.

This deployment guide discusses the HTTPS forward proxy. To configure the SG appliance as an HTTPS reverse proxy, refer to the *Blue Coat ProxySG Configuration and Management Guide* documentation suite.

Best Practices and Deployment: An FAQ

Question: What Do I Need to Know Before Deploying the SSL Proxy?

A: With SGOS 4.2.2, the default mode of operation for the SSL proxy is "intercept on exception, tunnel otherwise". Common examples of exceptions for which the SSL Proxy intercepts traffic in this default mode are certificate errors and policy based denials. To intercept HTTPS traffic for purposes other than error reporting (such as antivirus scanning or caching), you must create additional policy.

The SSL proxy can detect the following certificate errors for both intercepted and tunneled traffic:

❏ The certificate has expired (or is valid at a future date)

❏ The certificate issuer is untrusted; that is, the SG appliance does not recognize or trust the issuer of the certificate.

❏ The certificate has been revoked. The SG appliance does a revocation check using Certificate Revocation Lists (CRLs) to determine if the issuer of the certificate has revoked the certificate.

Recommendation: Do an audit of all internal HTTPS servers and verify that they use valid certificates before upgrading the SG appliance to SGOS 5.x. This ensures that internal HTTPS sites accessed through the SG appliance do not break after enabling the SSL Proxy.

A: After the SSL proxy starts intercepting traffic, it also verifies that the common-name (CN) in the certificate matches with the request URL, and denies data exchange between client and server when a mismatch is detected.

A: In case of server certificate errors, the SSL proxy intercepts the connection in default mode and sends an exception page to the browser with the cause of the error. In addition, from the SSL access logs, you can monitor the following fields to know which servers present certificates with errors and what the SG appliance is doing:

❐ `x-rs-certificate-observed-errors`: Shows all the actual error(s) detected with the certificate except `hostname-mismatch` error. Detected errors include `untrusted-issuer`, `expired`, and `revoked`.

❐ `x-rs-certificate-validate-status`: Shows the certificate validation status after following policy rules. If policy ignores a specific certificate validation error, this field shows the status as `CERT_VALID` although the certificate presented by a server has the error.

Recommendation: Leave the SSL proxy in its default mode. In this mode, the SSL proxy intercepts the connection in case of errors and reports an exception to the browser. If no errors are found, traffic is tunneled. This allows you to get a better understanding of the SSL traffic in your network and helps you write suitable interception policy.

Question: How Do I Fix Server Certificate Errors?

A: The following certificate errors can be detected by SSL Proxy:

❐ untrusted-issuer

❐ expired

❐ revoked

❐ hostname mismatch (intercepted connections only)

The most secure way to fix any of these errors is to get a new certificate that does not have the detected error. Many times, however, the sites presenting a bad certificate are not in administrative control. In this case, the SSL proxy provides a way to ignore certificate errors for certain sites through policy.

Recommendation: If you have internal HTTPS servers that use certificates issued by an internal Certificate Authority (CA), the SSL proxy flags such certificates with the "untrusted-issuer" error. To avoid such errors, import the internal CA certificate onto the SG appliance as a trusted certificate. Do not ignore untrusted-issuer errors through policy, because an untrusted-issuer error means that nothing from the certificate can be trusted.

Do not disable certificate validation globally. Make the determination of ignorable certificate errors on a case-by-case basis, as discussed below.

Procedure: To ignore certificate errors for specific sites

1. Launch the Visual Policy Manager from **Configuration>Policy>Visual Policy Manager**.

2. Add an SSL Access Layer by selecting **Policy>Add SSL Access Layer** from the menu bar.

   A policy row is added by default when you create a layer.

3. Right click the **Destination** field; select **Set**.

4. Click **New,** then:

   a. Add a condition for **Destination Host/Port** or **Server URL**.

   b. Add the IP address and the port.

   c. Click **Close**.

   d. Click **OK**.

5. Right click the **Action** field; select **Set**.

6. Click **New**.
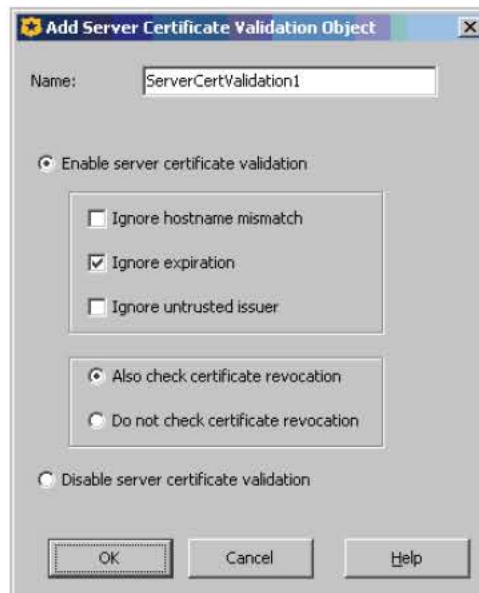
7. Select **Set Server Certificate** Validation.

   a. Select the certificate errors to ignore for the specific destination selected in Step 4.

   b. Click **OK**.

8. Click **OK**.

9. Apply the policy by clicking **Install Policy** in the upper-right-hand corner.

Question: How Do I Selectively Intercept SSL Traffic?

A: In order to selectively intercept SSL traffic using the most preferred method, you must configure a URL filter database.

Using the Blue Coat Web Filter as an example, the following steps illustrate setting up a rule to intercept selected categories.

1. Launch the Visual Policy Manager from **Configuration>Policy>Visual Policy Manager**.

2. Add an SSL Intercept Layer by selecting **Policy>Add SSL Intercept Layer**. from the menu bar.

   A policy row is added by default when you create a layer.

3. Right click the **Destination** field; select **Set**, then **New**.
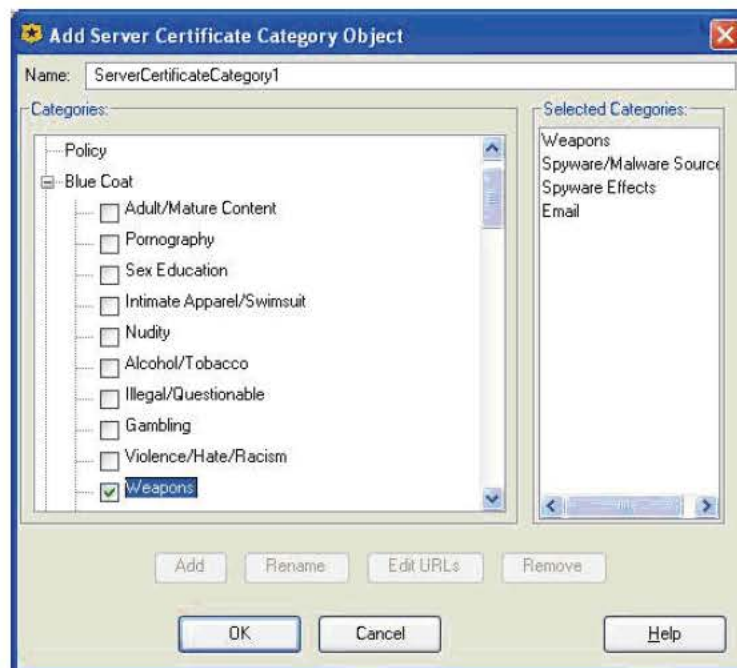
4. Select the **Server Certificate Category** and expand the **Blue Coat** category.

   Select the categories to intercept. Examples include weapons, Spyware/ Malware sources, secure web based e-mail, and the like.
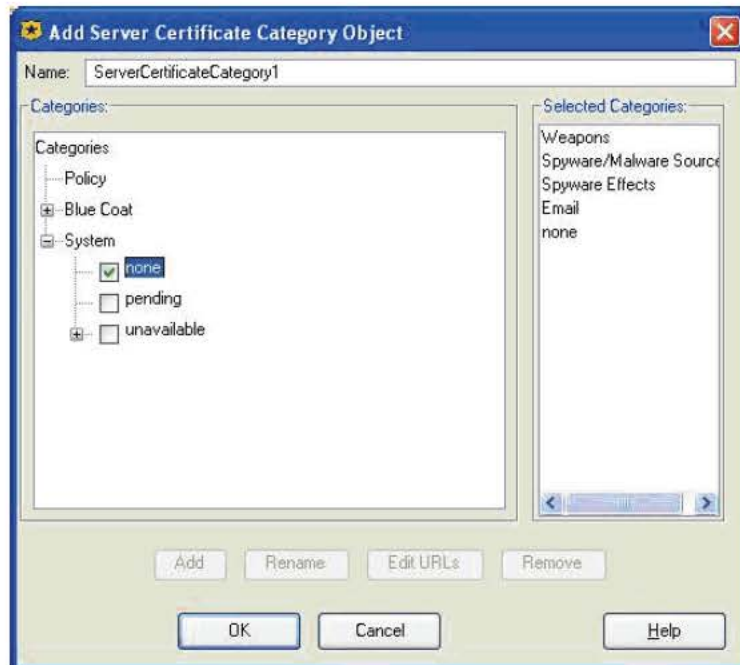
5. Expand the **System** category; select **none** to intercept Web sites whose categorization is unknown.

    This allows you to treat unrated sites as suspicious and apply security policies to the data transferred to and from such sites.

6. Click **OK**.

7. Click **OK**.

8. Right click the **Action** field; select **Set, then New**.
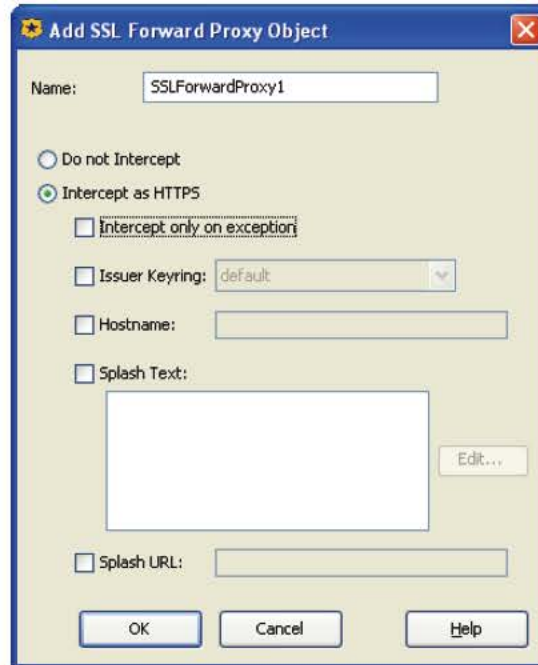
9. Select **SSL Forward Proxy Object**

10. Enable **Intercept as HTTPS** and **Issuer Keyring**. Make sure that the **Intercept only on exception** checkbox is NOT selected.

11. Click **OK**.

12. Click **OK**.

13. Apply the policy by clicking **Install Policy** in the upper-right-hand corner.

Question: Can the SG Appliance Help in Distributing Issuer Certificates to Client Desktops?

A: When the SSL Proxy intercepts an SSL connection, it presents an emulated server certificate to the client browser. The client browser issues a security pop-up to the end-user because the browser does not trust the issuer used by the SG appliance. This pop-up does not occur if the issuer certificate used by SSL Proxy is imported as a trusted root in the client browser's certificate store.

The SG appliance makes all configured certificates available for download via its management console. You can ask end users to download the issuer certificate through Internet Explorer or Firefox and install it as a trusted CA in their browser of choice. This eliminates the certificate popup for emulated certificates.

To download the certificate through Internet Explorer, see "To download a certificate through Internet Explorer". To download a certificate through Firefox, see "To download a certificate through Firefox" on page 18.

Procedure: To download a certificate through Internet Explorer

1. Go to **Statistics>Advanced**.

2. Select **SSL**.

3. Click **Download a ProxySG Certificate as a CA Certificate**; the list of certificates on the system display.

4. Click a certificate (it need not be associated with a keyring); the File Download Security Warning displays asking what you want to do with the file.

You can e-mail the console URL corresponding to the issuer certificate to end users so that the end-user can install the issuer certificate as a trusted CA.

File Download - Security Warning

Do you want to open or save this file?

Name: CertPlus_Class2P.cer
Type: Security Certificate
From: 10.9.59.243

[Open]   [Save]   [Cancel]

While files from the Internet can be useful, this file type can potentially harm your computer. If you do not trust the source, do not open or save this software. What's the risk?

5. Click Save. When the Save As dialog box displays, click Save; the file downloads.

6. Click Open to view the Certificate properties; the Certificate window displays.
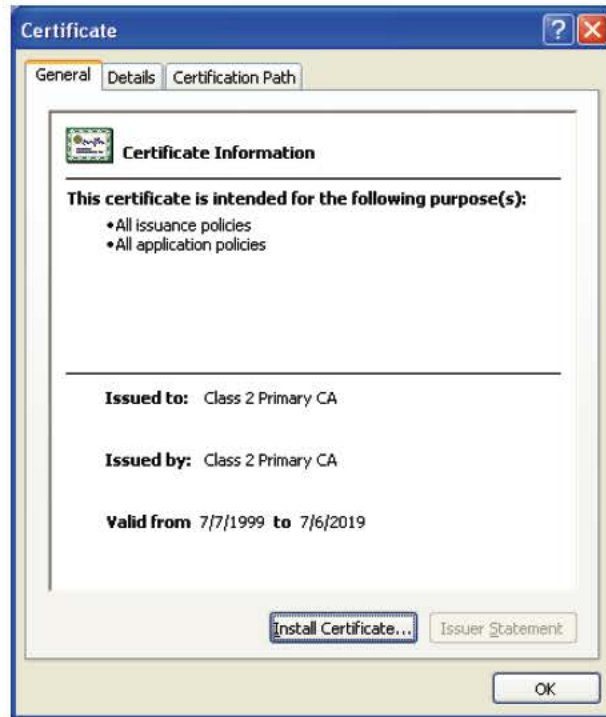
7. Click the **Install Certificate** button to launch the Certificate Import Wizard.

8. Make sure the **Automatically select the certificate store based on the type of certificate** radio button is enabled before completing the wizard; the wizard announces when the certificate is imported.

9. (Optional) To view the installed certificate, go to Internet Explorer, **Select Tools>Internet Options>Contents>Certificates**, and open either the **Intermediate Certification Authorities** tab or the **Trusted Root Certification Authorities** tab, depending on the certificate you downloaded.

Procedure: To download a certificate through Firefox

1. Go to **Statistics>Advanced**.

2. Select **SSL**.

You can e-mail the console URL corresponding to the issuer certificate to end users so that the end-user can install the issuer certificate as a trusted CA.

3. Click **Download a ProxySG Certificate as a CA Certificate**; the list of certificates on the system display.

4. Click a certificate (it need not be associated with a keyring); the **Download Certificate** dialog displays.

5. Enable the checkboxes needed. Note that you should view the certificate before trusting it for any purpose.

6. Click OK; close the Advanced Statistics window.

Question: **In addition to the warnings from individual browsers, I want to use a Webpage to more explicitly warn users of invalid certificates and allow them the choice of ignoring the error and continuing to the content. Can I do this with SSL Proxy?**

Description: Some servers may have invalid certificates, which trigger warnings from browsers for instances such as self-signed certificates (untrusted issuer), expired certificates, and hostname mismatches with the certificate. Users' connected to these sites through the SG appliance with the SSL proxy enabled can receive an additional error page explaining the reason why users could not access the page.

Solution: You can present a warning message to users and allow them to connect to the HTTPS site by clicking on a link. This requires two components: policy and modified exception pages.

You must

❏ Ensure SSL traffic is in intercept mode:

In **VPM**, create an SSL Intercept layer policy; intercept only the URLs you want to apply to the Certificate Not Valid policy.

❏ Modify the built-in exceptions:

- ssl_domain_invalid

- ssl_server_cert_expired

- ssl_server_cert_untrusted_issuer.

See "Certificate Not Valid Exception" on page 20.

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❐   Install the Certificate Not Valid Policy.

See

Certificate Not Valid Exception

This exception needs to be placed in your local policy.

```
(exception.ssl_domain_invalid
   (contact)
   (details "Your request contacted a host which presented a
 certificate with a Common Name that did not match the domain
 requested.")
   (format <<--eof--
Your request contacted a host which presented a certificate
 with a Common Name that did not match the domain requested.
 <br>
 <br>
 <form method="post" action="$(url)">
 <input type="submit" style="width:400;height:24;"
 value="Click here if you have a legitimate reason to access
 this site"></form>
 <br>
 --eof--
 )
 (help "This is typically caused by a Web Site presenting an
 incorrect or invalid certificate, but could be because of a
 configuration error.")
 (summary "Network Error")
 (http
 (code "409")
 (contact)
 (details)
 (format)
 (help)
 (summary)
 )
 )
 (exception.ssl_server_cert_expired
 (contact)
 (details "Your request contacted a host which presented an
 expired or Invalid certificate")
 (format <<--eof--
Your request contacted a host which presented an expired or
 Invalid certificate.
 <br>
 <br>
 <form method="post" action="$(url)">
 <input type="submit" style="width:400;height:24;"
 value="Click here if you have a legitimate reason to access
 this site"></form>
 <br>
 --eof--
 )
 (help "This is typically caused by a Web Site presenting an
 incorrect or invalid certificate, but could be because of a
 configuration error. ")
```

```
(summary "Network Error")
(http
(code "503")
(contact)
(details)
(format)
(help)
(summary)
)
)
(exception.ssl_server_cert_untrusted_issuer
(contact)
(details "Your request contacted a host which presented a
certificate signed by an untrusted issuer.")
(format <<--eof--
Your request contacted a host which presented a certificate
signed by an untrusted issuer.
<br>
<br>
<form method="post" action="$(url)">
<input type="submit" style="width:400;height:24;"
value="Click here if you have a legitimate reason to access
this site"></form>
<br>
--eof--
)
(help "This is typically caused by a Web Site presenting an
incorrect or invalid certificate, but could be because of a
configuration error.")
(summary "Network Error")
(http
(code "503")
(contact)
(details)
(format)
(help)
(summary)
)
)
```

Certificate Not Valid Policy

```
<exception> condition=sslexception
   action.mycookie(yes)

<proxy>
   condition=sslallow request.header.cookie="sslallow"
   action.rewtohttps(yes)
   request.header.cookie="sslallow" action.red(yes)

<ssl>
   condition=sslallow server.certificate.validate(no)
```

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```
<proxy>
  define action mycookie
    set(exception.response.header.set-cookie,"sslallow")
  end
  define action rewtohttps
    rewrite(url,"^https://(.*)\/xyzallow","https://$(1)")
  end
 define action red
   redirect(302,"https://(.*)","https://$(1)/xyzallow")
 end
 define condition sslallow
   url.regex="\/xyzallow$"
   url.regex="\/xyzallow/$"
 end
 define condition sslexception
   exception.id=ssl_server_cert_untrusted_issuer
   exception.id=ssl_server_cert_expired
   exception.id=ssl_domain_invalid
 end
```

Notes:

❑ For an invalid certificate, the `xyzallow` value is appended to the URL after user clicks on **Accept.** This is expected behavior.

Question: How Do I Protect End-User Privacy and Avoid Accidental Exposure of Sensitive Information When Intercepting SSL Traffic?

A: For intercepted SSL traffic, potentially sensitive information is available in cleartext in the following locations:

❑ If ICAP scanning is enabled for intercepted HTTPS traffic, such data is sent without encryption to the ICAP server.

❑ You can log request and response headers containing sensitive information to the access log and event log.

❑ If you use an off-box URL filtering solution, part of the URL may be sent in cleartext to the URL database service point. Note that such a service point can be located on the internet.

❑ Intercepted HTTPS content that is cacheable is also available on the disk in the clear.

Recommendation: Take the following measures to avoid accidental exposure of sensitive information:

• Use care in determining which sites to intercept. Avoid intercepting well-known banking and financial sites. On-box URL databases and server certificate categories can be used in determining which sites to intercept.

- Use on-box URL databases, such as Blue Coat Web Filter or a third-part content filtering vendor, to avoid transmitting URLs in cleartext.

- Implement HTML notification for intercepted sites. This can be used to inform end-users that their HTTPS traffic will be monitored and that they can opt-out if they do not want their traffic to be intercepted. HTML notification is also helpful if a site is accidentally intercepted.

- If you use ICAP scanning for intercepted HTTPS content, make sure the network link between the SG appliance and the ICAP server cannot be snooped.

- Do not log URL or header information for intercepted HTTPS traffic. (By default, the SSL log does not log this information.)

The SG appliance allows you to set up notification two ways, HTML notification and client consent certificates

Setting up HTML Notification

Procedure: Set up HTML notification only for HTTPS sites:

1. Launch the Visual Policy Manager from **Configuration > Policy > Visual Policy Manager**.

2. Add a new rule to the Web Access layer.

   a. Right click the **Action** field; select **Set**.

   b. Click **New**, then select the **Notify User** object.

   c. Customize the **Notify User object** as needed.

   d. Click **OK**.

   e. Click **OK**.

   f. Right click the **Service** field; select **Set**.

   g. Click **New**, then select the **Client Protocol** object.

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> **h.** Select **HTTPS** from the drop-down list in the top field; make sure **ALL HTTPS** is selected from the drop-down list in the lower field.
>
> **i.** Click **OK**.

3. Click **OK**.

4. Apply the policy by clicking **Install Policy** in the upper-right-hand corner.

Question: How do I set up SSL Proxy in Explicit Mode?

A: The SSL Proxy can be used in explicit mode in collaboration with the HTTP Proxy or SOCKS Proxy. You must create an HTTP Proxy service or SOCKS Proxy service and use it as the explicit proxy from desktop browsers. When requests for HTTPS content are sent to either a SOCKS proxy or an HTTP proxy, the proxies can detect the use of the SSL protocol on such connections and enable SSL Proxy functionality. Note that SSL protocol detection should be enabled for the proxy service in use (HTTP or SOCKS).

To create an explicit SSL proxy, complete the following steps:

❐ Configure the browser on the desktop to use a proxy or point to a PAC file that points to the proxy.

❐ Coordinate with other devices, such as a firewall, to prevent users from accessing the internet without a proxy.

❐ Confirm that an HTTP proxy or SOCKS proxy service is present on desired port and that protocol detection is enabled for that service.

❐ Create or import an issuer keyring or use the defaults.

❐ Configure SSL proxy rules through VPM.

Disabled Proxy Settings

Using Proxy Settings to Access the Internet
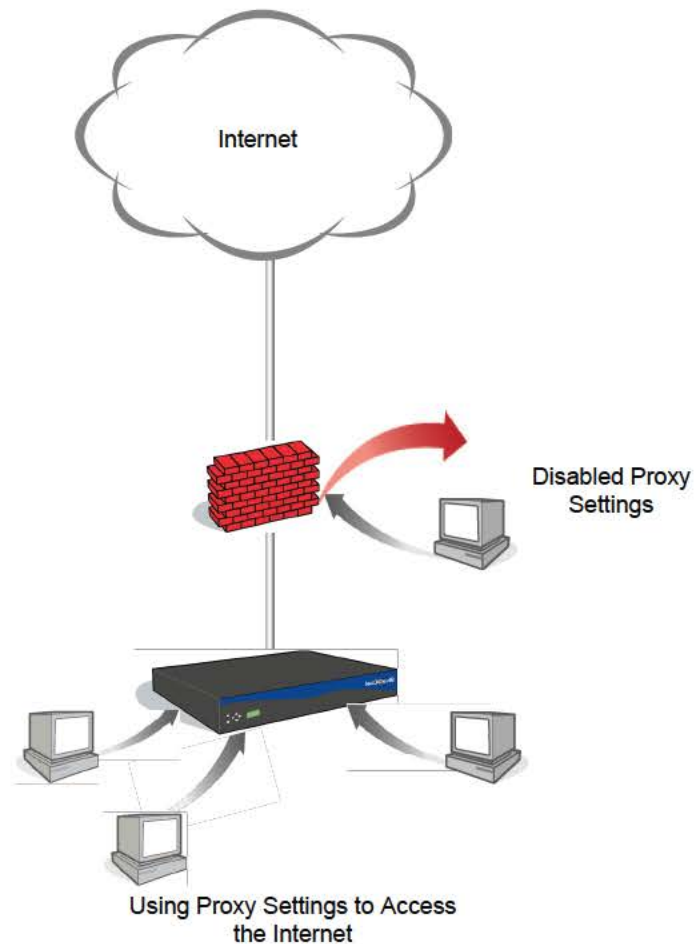
Question: How Do I Deploy SSL Proxy in Transparent Mode?

A: In a transparent proxy configuration, neither the client (browser) nor the desktop knows that the traffic is being processed by a machine other than the origin content server (OCS). The browser believes it is talking to the OCS, so the request is formatted for the OCS; the proxy determines for itself the destination server based on information in the request, such as the destination IP address in the packet, or the Host: header in the request.

A transparent proxy requires one of the following:

☐ A hardware bridge.

☐ A WCCP switch.

☐ An L4 switch.

Bridging functionality allows SG appliances to be deployed in environments where L4 switches, explicit proxies, and WCCP-capable routers are not feasible options.

A branch office that would take advantage of a bridging configuration is likely to be small (from 20 to 50 users); for example, it might have only one router and one firewall in the network, as shown below.

To create a transparent SSL proxy, complete the following steps:

Configure the hardware to use a transparent proxy.

- Create an SSL service on port 443.

- Create or import an issuer keyring or use the defaults.

- Configure SSL proxy through VPM or CPL.

LAN
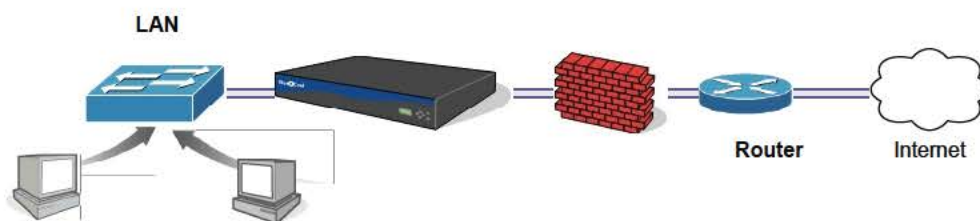
Question: How Do I Deploy the SSL Proxy in a Proxy Chain?

A: A typical SSL proxy chain is shown below.

Upstream SG Appliance
(Data Center)

Downstream SG Appliance
(Branch Office)

The SG appliance at the branch office (the downstream device) uses the SG appliance at the data center (the upstream device) as its forwarding host, allowing SSL Proxy functionality to be enabled at both the appliances.

Tips on Setting Up SSL Proxy Chaining Functionality

❑ The upstream SG appliance is configured as the forwarding host of type "HTTP proxy" for the downsteam SG appliance.
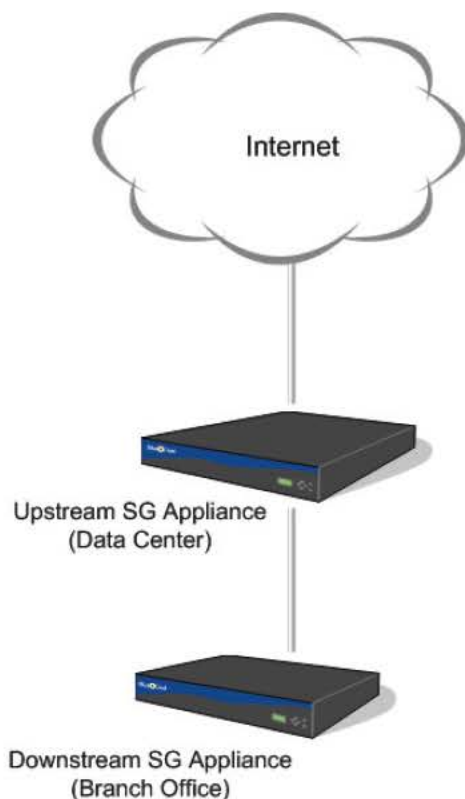
❑ Both proxies have identical SSL related policy; that is, both should make identical decisions in terms of which SSL connections are intercepted and which SSL connections are tunneled.

❑ The issuer certificate used by the upstream SG appliance to sign emulated certificates should be imported as a CA certificate on the downstream SG appliance. This ensures that the downstream device can successfully verify emulated certificates presented by the upstream device.

Note that this applies to intercepted SSL connections only. For tunneled SSL connections the downstream SG appliance sees the original server certificate.

Now, when an SSL connection is intercepted at the upstream appliance, the appliance emulates the server certificate and presents the emulated server certificate to the downstream SG appliance.

For information on using forwarding hosts, refer toVolume 8 of the Blue Coat SG Appliance Configuration and Management documentation suite.

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Question: I am Using a Transparent Proxy Deployment. How Do I Allow Non-SSL Traffic on Port 443 to Certain Servers While Still Enabling the SSL Proxy for the Rest of the Port 443 Traffic?

A: Some legitimate applications, such as the SOCKS-based VPN clients from Aventail and Permeo, use port 443 to communicate to the VPN gateway. However, the protocol they use is not SSL. An SSL service created on port 443 that transparently terminates such TCP connections breaks these applications. That is because the SSL service enforces the use of the SSL protocol.

Administrators would want to allow such SOCKS-based VPN tunnels to a few trusted partner sites.

Procedure: To enable non-SSL protocols on port 443 for certain applications

1. Create a transparent TCP-tunnel service on port 443. Do not create an SSL service on port 443.

2. Specify the list of servers that can use port 443 for non-SSL protocols in policy:

   ```
   define condition Trusted_non_ssl_servers
     url.address=1.1.1.1
     url.address=2.2.2.2
     end condition Trusted_non_ssl_servers
   ```

3. Write a <proxy> layer that forces all other traffic on port 443 to use the SSL protocol:

   ```
   <proxy>
     proxy.port=443 condition =! Trusted_non_ssl_servers
     force_protocol(ssl)
   ```

These rules ensures that port 443 connections to the list of trusted servers are tunneled without intervention while all other port 443 connections use the SSL protocol.

For information on creating TCP-tunnel services, refer toVolume 3 of the *Blue Coat SG Appliance Configuration and Management documentation suite*.

Question: Windows Updates Fail When I Use the SSL Proxy to Intercept all SSL Connections.

A: SSL connections for Windows updates should always be tunneled.

```
<ssl-intercept>
server.certificate.hostname=update.microsoft.com \
  ssl.forward_proxy(no)
  ssl.forward_proxy(https)
```

The same policy can be created in VPM using the **SSL Intercept Layer**, the **Server Certificate Object,** and the **SSL Forward Proxy object.**

Note that you only need to do this if the policy intercepts everything. If you do selective interception, as recommended, this issue does not arise.

Question: I have CA Hierarchy in Place in My Enterprise. Can I Use it for Certificate Emulation?

A: Some enterprises have a well-defined CA Certificate hierarchy (chain) in place. For example, Clothing-Max, a retail clothing outlet with 150 stores in the U.S. and Canada, has the following:

The Clothing-Max Root CA Certificate is at the top of the hierarchy and has issued a CA certificate for the Clothing-Max IT department. In turn, the IT department issues a CA certificate for the IT security team.

If the security team wants to deploy the SSL proxy using its CA certificate as the issuer for emulated certificates, the team will import this certificate and its private key on the SG appliance. Note that the intermediate CA must be imported in two places on the SG appliance.

❑ It must be imported under the "Keyrings" panel where both the private key and the certificate are stored.

❑ It must be imported under " CA Certificates" panel on SG appliance. This second step ensures that the SSL Proxy chains the intermediate CA certificate along with the emulated certificate.

The SG appliance now signs the emulated certificates using the private key of the Clothing-Max IT Security Team CA Certificate. The certificate chain for an emulated certificate for a Clothing-Max server will be:

Root CA	Intermediate CAs	Emulated Certificate
Clothing-Max	Clothing-Max IT	
	Clothing-Max IT Security Team	Clothing-Max Server

In this case the browser does not show a security pop-up if it is able to verify all certificates in the certificate hierarchy.

If you use Internet Explorer, additional requirements are necessary on the intermediate CA certificates in the certificate chain:

Intermediate CA certificates must contain the basic constraints certificate extension with the Subject Type set to CA. Also, if your intermediate CA certificate has a KeyUsage extension, make sure it has the "Certificate Signing" attribute present.

Root CA certificates are exempt from this requirement:

Root CA	Intermediate CA	Intermediate CA
Clothing-Max	Clothing-Max IT	Clothing-Max IT Security Team

The illustration below shows a Verisign Class 2 Intermediate Certificate Basic Constraints Extension.

For detailed information on creating an Intermediate CA using OpenSSL, refer to Volume 3 of the Blue Coat SG Appliance Configuration and Management documentation suite.
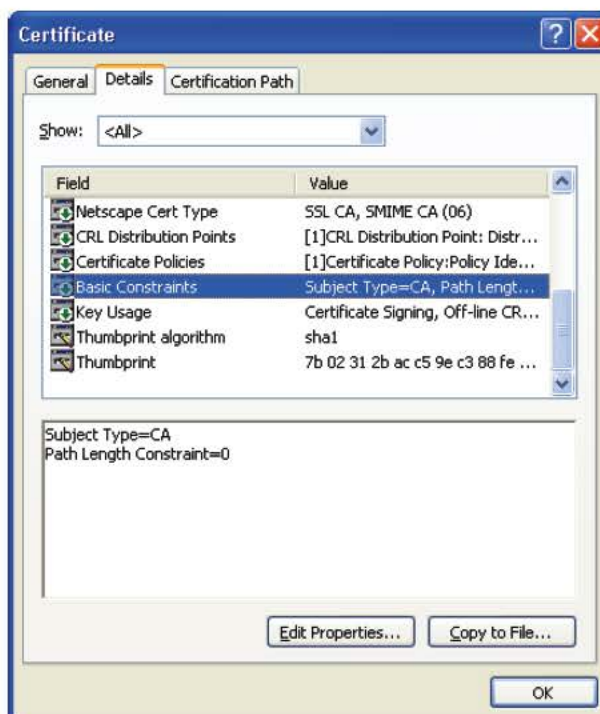
Question: How Does the HTTP Proxy Securely Process the CONNECT Method?

A: A.: It follows the rules outlined in the flow chart below.

HTTP CONNECT Behavior for SG 4.2.2

START

Does policy affect SSL protocol detection?

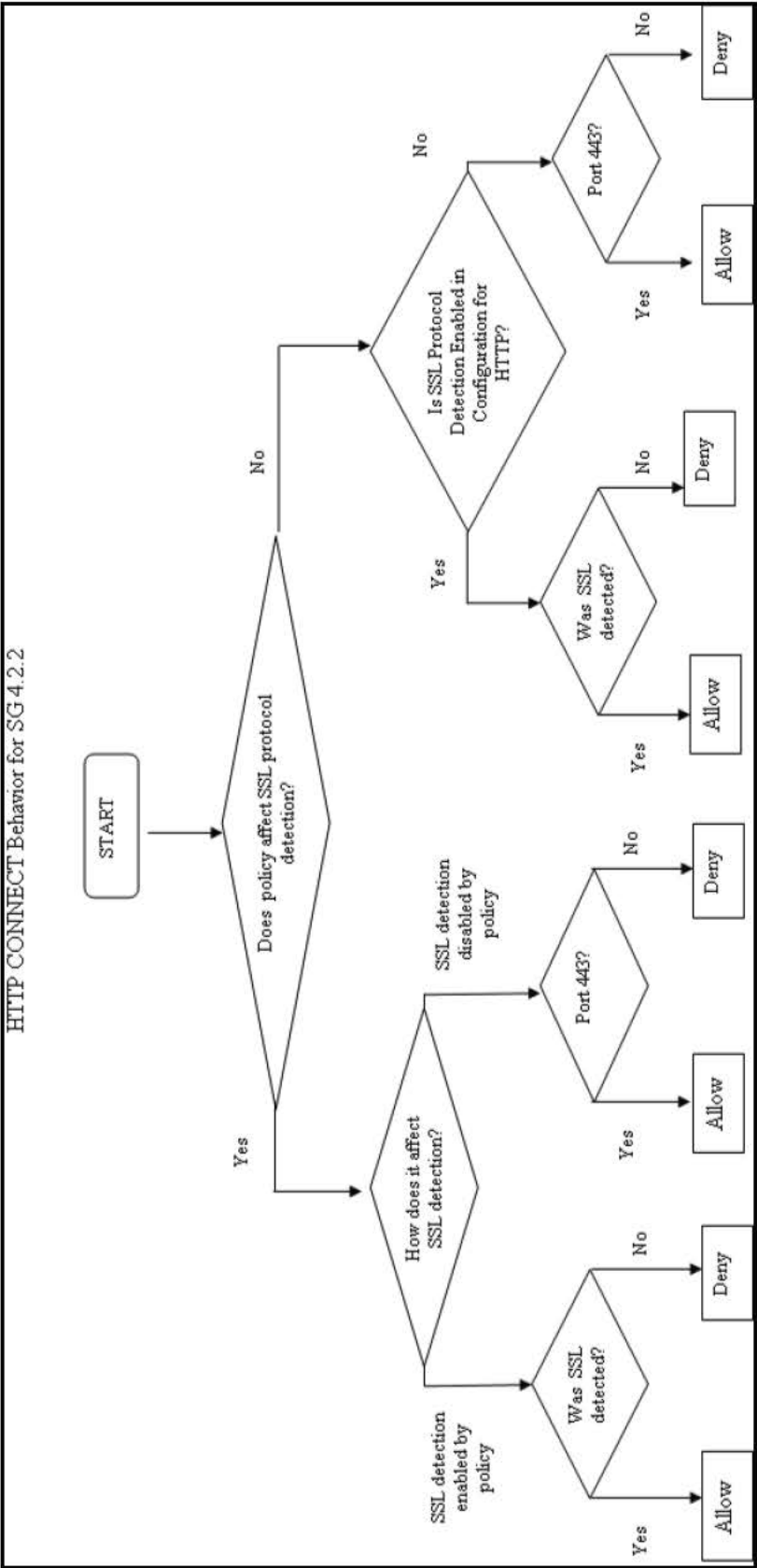**Yes** → How does it affect SSL detection?

- SSL detection enabled by policy → Was SSL detected?
  - Yes → Allow
  - No → Deny
- SSL detection disabled by policy → Port 443?
  - Yes → Allow
  - No → Deny

No → Is SSL Protocol Detection Enabled in Configuration for HTTP?

- Yes → Was SSL detected?
  - Yes → Allow
  - No → Deny
- No → Port 443?
  - Yes → Allow
  - No → Deny

Troubleshooting Tips

Problem: Can't Reach an HTTPS Site

Description: A request to an HTTPS site results in a failure to reach the site and the browser displays an HTML error page that describes a certificate error . In the SG appliance event log, one of the following is displayed:

```
"Server certificate validation failed for support.bluecoat.com
at depth 0, reason Untrusted Issuer" 0 310000:1 ../ssl_proxy/
sslproxy_worker.cpp:1157
```

```
"Server certificate validation failed for www.etrade.com at
depth 0, reason Certificate expired or not valid yet" 0
310000:1 ../ssl_proxy/sslproxy_worker.cpp:1157
```

Solutions:

Option 1 (Most Secure):

❒ For untrusted issuer errors:

Get the CA certificate from the server administrator and import it to the SG appliance. This is secure only if you can trust the CA's policies when they issue server certificates. When validating the new server certificate, make sure that a new browser instance is used.

❒ For expired certificate errors:

• First check the clock on your proxy. Since the expiration check compares the dates in the certificate against the proxy's clock, make sure that the correct date and time is set.

• If you still get certificate expired errors, the most secure solution is to get a new certificate with valid dates. This may not possible if you do not control the server.

Option 2 (Less Secure):

Create and install policy to ignore specific errors.

❒ To ignore untrusted issuer errors

```
<ssl>
  server_url.host="intranet.company.com" \
  server.certificate.validate.ignore.untrusted_issuer(yes)
```

❐ To ignore certificate expiration errors:

```
<ssl>
    server_url.host="intranet.company.com" \
    server.certificate.validate.ignore_expiration(yes)
```

Upgrading and Using SSL Client Certificates with Internet Explorer

After upgrade to SGOS 4.2.x, client certificate authentication can stop working with Internet Explorer if the HTTPS reverse proxy service in question is not using a CA-Certificate List (CCL). This is because IE cannot handle the long list of CAs presented by SG in he handshake messages.

Problem: Client Certificates do not Work with Internet Explorer

Description: When the SG appliance requests a client certificate from the browser, it includes the list of CAs it trusts in the "Certificate Request" message. The default list of CA certificates configured on the SG appliance has grown and now spans multiple SSL records. Internet Explorer cannot handle SSL handshake messages than span multiple SSL records.

Solutions:

❐ For the SSL Proxy, this issue means that the client consent certificate feature that allows the SG appliance to notify users in advance of HTTPS interception does not work with Internet Explorer. No workaround exists.

❐ For the HTTPS Reverse Proxy, you can create a CCL, which reduces the number of CAs trusted by a service to the point where Internet Explorer can handle it.

Problem: Want to Use Client Certificates to Communicate with Server using the SSL Proxy

Description: When the SSL Proxy is intercepting HTTPS traffic, request to a HTTPS site results in a failure if the server requires a client certificate.

Solution: You can use client certificates to communicate with the server as long as the SSL proxy is used in tunnel mode. You cannot use client certificates to communicate with the server when the SSL proxy is intercepting traffic.

Logging

Problem: Want to Include other Information in the SSL Access Log

Description: The default access log fields for the SSL log do not contain any sensitive information. Only information that can be seen in the clear on the wire is included in the SSL access log.

This problem only affects Internet Explorer. Other browsers do not have this issue.

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Solution: The SSL access log is customizable, meaning that you can add fields that containing sensitive information. For more information on configuring access logs, refer to Chapter 21 in the *Blue Coat ProxySG Configuration and Management Guide.*

Problem: SSL Access Log Contains No Data

Description: When your are intercepting all traffic and logging it, the log remains empty.

Solution: You might be logging all https-forward-proxy connections (that is, intercepted connections) to the main facility instead of the SSL facility.

Microsoft

Problem: Windows Update

Description: The Windows update does not work when the SSL Proxy intercepts windows updates connections. This is because the Windows update client does not trust the emulated certificate presented by the SSL Proxy.

Solution: SSL connections for Windows updates should always be tunneled.

```
<ssl-intercept>
  server.certificate.hostname=update.microsoft.com \
  ssl.forward_proxy(no)
  ssl.forward_proxy(https)
```

Problem: login through HTTP with MSN IM Client Fails

Description: Logging in to the MSN IM client fails if the SSL Proxy is intercepting HTTP traffic, and the proxy does not display a certificate pop-up. This is because the IM client does not trust the emulated certificate presented by the SSL Proxy.

Solution: Write policy to disable SSL interception for login.passport.com, such as:

```
ssl-intercept>
  condition=!DoNotInterceptList ssl.forward_proxy(https)

; Definitions
  define condition DoNotInterceptList
  server.certificate.hostname=login.live.com
  server.certificate.hostname=loginnet.passport.com
end
```

Solution: Import The Blue Coat appliance's issuer certificate as trusted in the browser.

SKYPE

Problem: Want to Allow Skype for a Specific User

Description: While Skype uses HTTP and SSL as transport protocol, the application content is proprietary to Skype and does not adhere to HTTP standards.

Solution: To allow Skype for a specific user:

❏ Create a firewall policy that denies clients from going directly to the Internet.

❏ Allow only the SG appliance to connect to the Internet for HTTP, HTTPS and FTP services.

❏ Install SGOS 4.2.2 or higher with a valid SSL proxy license.

❏ Ensure that the SG appliance is has SSL detection enabled for HTTP CONNECT, SOCKS, and TCP Tunnel under **Configuration > Services > SSL Proxy**.

❏ Verify the policy as described in *Verifying Skype Request Blocking* in the following TechBrief:

http://www.bluecoat.com/downloads/support/tb_skype.pdf