

Blue Coat® Systems SG™ Appliance

Configuration and Management Guide

Volume 3: Proxies and Proxy Services

Version SGOS 5.1.x



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Chapter 1: About Proxies and Proxy Services

A proxy filters traffic, monitors Internet and intranet resource usage, blocks specific Internet and intranet resources for individuals or groups, and enhances the quality of Internet or intranet user experiences.

A proxy serves as an intermediary between a Web client and a Web server and can require authentication to allow identity-based policy and logging for the client, as discussed in *Volume 5: Securing the Blue Coat SG Appliance*.

Proxies have two major components:

- The proxy service needs to be created or enabled and various attributes set, such as whether you want the proxy to use explicit or transparent mode
- The proxy itself needs to be configured to intercept the traffic desired. You can configure it in reverse or forward mode.

Creating or Enabling a Proxy Service

Services are created through the **Configuration > Services** menu. Blue Coat has two types of services: console services, used to communicate with the SGappliance, and proxy services, used to communicate with other systems.

Console services are discussed further in [Chapter 2: "About Console Services" on page 13](#).

For a list of available proxy services and proxies, see [Chapter 3: "About Proxy Services" on page 23](#).

One of the first decisions you make when configuring a proxy is whether the proxy or proxy service will use explicit or transparent attributes.

Explicit/Transparent proxy specifies the mode the client requests get to the proxy.

- Explicit—The default, requiring software configuration for both browser and service. This service attribute sends requests explicitly to a proxy instead of to the origin content servers.
- Transparent—Requires a bridge, such as that available in the SG appliance; a Layer-4 switch, or a WCCP-compliant router. You can also transparently redirect requests through an SG appliance by setting the workstation's gateway to the appliance IP address. This service attribute sends requests to the proxy without the client or server being aware of it.

Some software configuration on the SG appliance is also required to allow the appliance to know what traffic to intercept.

You might configure both proxy types, depending on the services you require. For information on understanding explicit and transparent proxies and the configuration requirements, see [Appendix B: "Explicit and Transparent Proxy" on page 175](#).

Configuring Proxies

After you have created or enabled the proxy services you need, the next step is to configure the proxy that will use that service. Some proxy services require little configuration; others, such as the SSL proxy, require configuration depending on what you want to do and also require policy to be configured to work effectively.

About This Book

This book deals with the following topics:

- Chapter 2: "About Console Services" on page 13
- Chapter 3: "About Proxy Services" on page 23
- Chapter 4: "Managing the CIFS Proxy" on page 35
- Chapter 5: "Managing the DNS Proxy" on page 51
- Chapter 6: "Managing the Endpoint Mapper and MAPI Proxies" on page 55
- Chapter 7: "Managing the FTP Proxy" on page 69
- Chapter 8: "Managing the HTTP Proxy" on page 77
- Chapter 9: "Creating and Editing an HTTPS Reverse Proxy Service" on page 113
- Chapter 10: "Managing Shell Proxies" on page 121
- Chapter 11: "Managing a SOCKS Proxy" on page 129
- Chapter 12: "Managing the SSL Proxy" on page 137
- Chapter 13: "Managing the TCP Tunneling Proxy" on page 163
- Appendix A: "Glossary" on page 167
- Appendix B: "Explicit and Transparent Proxy" on page 175

Document Conventions

The following table lists the typographical and Command Line Interface (CLI) syntax conventions used in this manual.

Table 1-1. Document Conventions

Conventions	Definition
<i>Italics</i>	The first use of a new or Blue Coat-proprietary term.
Courier font	Command line text that appears on your administrator workstation.
<i>Courier Italics</i>	A command line variable that is to be substituted with a literal name or value pertaining to the appropriate facet of your network system.
Courier Boldface	A Blue Coat literal to be entered as shown.
{ }	One of the parameters enclosed within the braces must be supplied
[]	An optional parameter or parameters.
	Either the parameter before or after the pipe character can or must be selected, but not both.

About Procedures

Many of the procedures in this volume begin:

- Select Configuration > Services**, if you are working in the Management Console, or
- From the (config) prompt**, if you are working in the command line interface (CLI).

Blue Coat assumes that you already logged into the first page of the Management Console or entered into configuration mode in the CLI.

Illustrations

To save space, screen shots illustrating a procedure often have the bottom portion removed, along with the blank space.

The screenshot shows the 'General' configuration pane. It contains two sections: 'Unique name for this ProxySG Appliance:' and 'Serial number of the ProxySG Appliance:'. Both sections have a 'Name:' label followed by an input field containing the value '172.16.90.44 - Blue Coat SG200 Series' and '4605060001' respectively. Below these sections is a large empty white area. At the bottom of the pane, there is a horizontal row of four buttons: 'Preview', 'Apply', 'Revert', and 'Help'.

Figure 1-1. Configuration > General Pane with Bottom Buttons

This screenshot is identical to Figure 1-1, showing the 'General' configuration pane with its two sections and the bottom buttons ('Preview', 'Apply', 'Revert', 'Help'). The only difference is that the bottom portion of the pane, including the large empty white area, has been removed, leaving a shorter vertical space.

Figure 1-2. Configuration > General Pane with Bottom Buttons Removed

Chapter 2: About Console Services

The SG appliance ships with four consoles designed to manage communication with the system:

- ❑ HTTP and HTTPS Consoles: These consoles are designed to allow you access to the Management Console. The HTTPS Console is created and enabled by default; the HTTP Console is created by default but not enabled because it is less secure than HTTPS.
- ❑ SSH Console: This console is created and enabled by default, allowing you access to the CLI using an SSH client.
- ❑ Telnet Console: This console is not created because the passwords are sent unencrypted from the client to the SG appliance. You must create and enable the console before you can access the appliance through a Telnet client (not recommended).

Table 2-1. Console Services

Console Service	Default Port	Status	Configuration Discussed
HTTP-Console	8081	Disabled	“Notes on Managing the HTTP Console” on page 15.
HTTPS-Console	8082	Enabled	“Managing the HTTPS Console (Secure Console)” on page 15.
SSH-Console	22	Enabled	“Managing the SSH Console” on page 18.
Telnet-Console	—	Not Created	“Notes on Managing the Telnet Console” on page 21.

About Console Services

Console services are used to manage the SG appliance. As such, bypass entries are ignored for connections to console services.

The basic procedure for creating or editing a console service is shown below.

To edit or create a console service:

1. Select **Configuration > Services > Console Services**.

Console Services				
Name	Console	Proxy IP	Port	Enabled
HTTPS-Console	HTTPS Console	<All>	8082	<input checked="" type="checkbox"/>
SSH-Console	SSH Console	<All>	22	<input checked="" type="checkbox"/>
HTTP-Console	HTTP Console	<All>	8081	<input type="checkbox"/>

New Edit Delete

2. To enable or disable a service, select or de-select the **Enable** checkbox.
3. To change other settings on a specific console, highlight the service and click **Edit**.
4. To create a new console service, click **New**.



- a. Give the console service a name, using the **Name** field.
- b. Select the console that is used for this service.
- c. Click **New** to view the **New Listener** dialog. A listener defines the fields where the console service will listen for traffic. <All> indicates the service listens on all addresses; IP address indicates that only destination addresses matching the IP address .Fill in the fields appropriate for your environment and the console service you want to create.

5. Click **OK**.

Relevant CLI Syntax to Create/Edit a Console Service:

- To enter configuration mode for the service:

```
SGOS(config) console-services
SGOS(config console-services) create {https-console | http-console |
ssh-console | telnet-console} console_name
SGOS(config console-services) edit console_name
```

- The following subcommands are available:

```
SGOS (config name) add {all | proxy-ip_address} port_number {enable |
disable}
SGOS (config console_name) disable {all | proxy-ip_address}
port_number
SGOS (config console_name) enable {all | proxy-ip_address} port_number
SGOS (config console_name) exit
SGOS (config console_name) remove {all | proxy-ip_address} port_number
SGOS (config console_name) view
```

Notes on Managing the HTTP Console

The default HTTP Console is already configured; you only need to enable it.

You can create and use more than one HTTP Console as long as the IP address and the port do not match the existing HTTP Console settings.

To create a new HTTP Console service or edit an existing one, see “About Console Services” on page 13.

Managing the HTTPS Console (Secure Console)

The HTTPS Console provides secure access to the Management Console through the HTTPS protocol.

You can create multiple management HTTPS consoles, allowing you to simultaneously access the Management Console using any IP address belonging to the SG appliance as well as any of the appliance’s virtual IP (VIP) addresses. The default is HTTPS over port 8082.

Creating a new HTTPS Console port requires three steps, discussed in the following sections:

- Selecting a keyring (a keypair and a certificate that are stored together)
- Selecting an IP address and port on the system that the service will use, including virtual IP addresses
- Enabling the HTTPS Console Service

Selecting a Keyring

The SG appliance ships with a default keyring that can be reused with each console that you create. You can also create your own keyrings.

To use the default keyring, accept the default keyring through the Management Console. If using the CLI, the default keyring is automatically used for each new HTTPS Console that is created. To use a different keyring you must edit the console service and select a new keyring using the attribute keyring command.

Note: When using certificates for the HTTPS Console or for HTTPS termination services that are issued by Certificate Signing Authorities that are not well-known, see [Chapter 9: "Creating and Editing an HTTPS Reverse Proxy Service" on page 113](#).

If you get “host mismatch” errors or if the security certificate is called out as invalid, create a different certificate and use it for the HTTPS Console.

For information on creating a keypair and a certificate to make a keyring, see [Chapter 9: "Creating and Editing an HTTPS Reverse Proxy Service" on page 113](#).

Selecting an IP Address

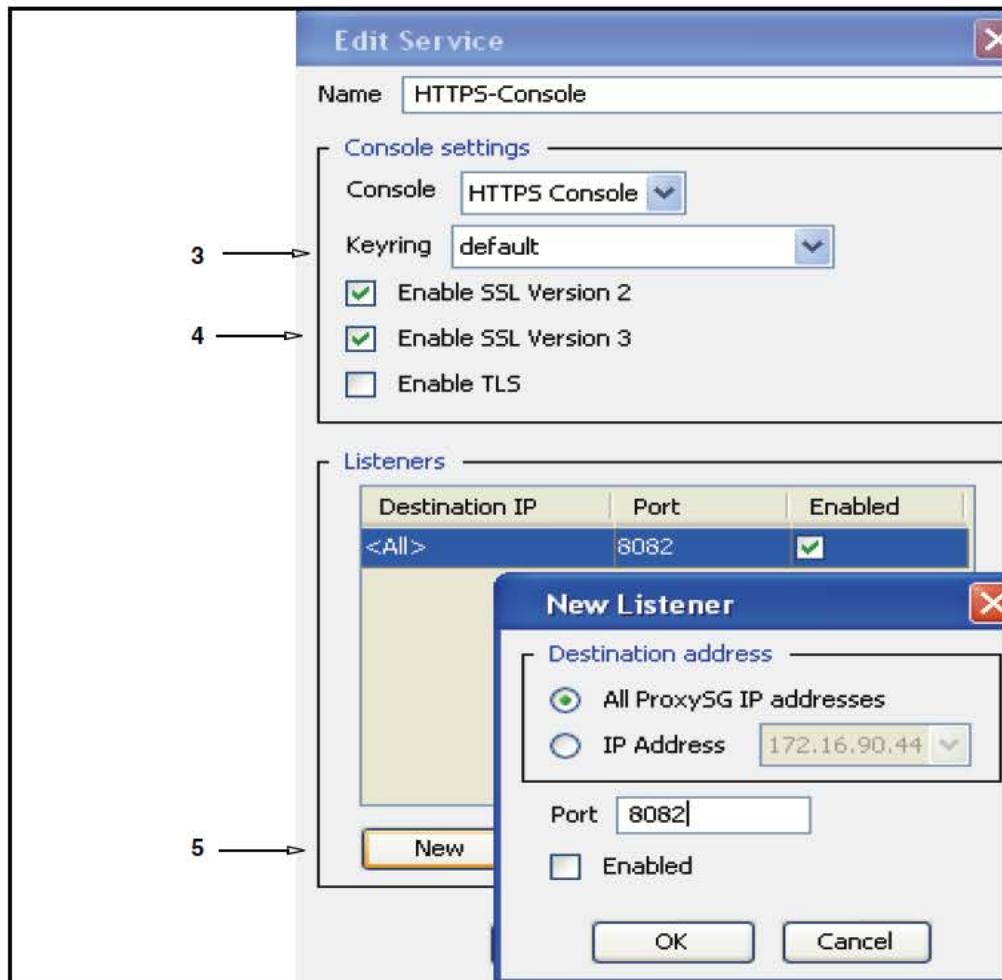
You can use any IP address on the SG appliance for the HTTPS Console service, including virtual IP addresses. To create a virtual IP address, refer to *Volume 6: Advanced Networking*.

Enabling the HTTPS Console Service

The final step in editing or creating an HTTPS Console service is to select a port and enable the service.

To create or edit an HTTPS Console port service:

1. Select **Configuration > Services > Console Services**.
2. Do one of the following:
 - To create a new HTTPS Console service, see “[About Console Services](#)” on page 13.
 - To edit the configuration of an existing HTTPS Console service, highlight the HTTPS Console and click **Edit**.



3. In the **Keyring** drop-down list, which displays a list of already-created keyrings on the system, select the keyring you want to use. The system ships with a default keyring that is reusable for each HTTPS service.

Note: Two keyrings: configuration-passwords-key keyring an application-key keyring cannot be used for console services.

4. (Optional) Select the appropriate checkboxes to determine the SSL version used for this console.
5. Click **New** to add a new listener to the HTTPS console; click **Edit** to change the current settings.

The default IP address value is **<All>**. To limit the service to a specific IP address, select an IP address from the drop-down list that contains all IP addresses assigned to the SG appliance.

6. Identify the port you want this service to listen on.
7. Click **OK**.

Managing the SSH Console

By default, the SG appliance uses Secure Shell (SSH) and password authentication so administrators can access the CLI or Management Console securely. SSH is a protocol for secure remote logon over an insecure network. No action is required unless you want to change the existing SSH host key, disable a version of SSH, or import RSA host keys.

To create a new SSH Console service or edit an existing one, see “About Console Services” on page 13.

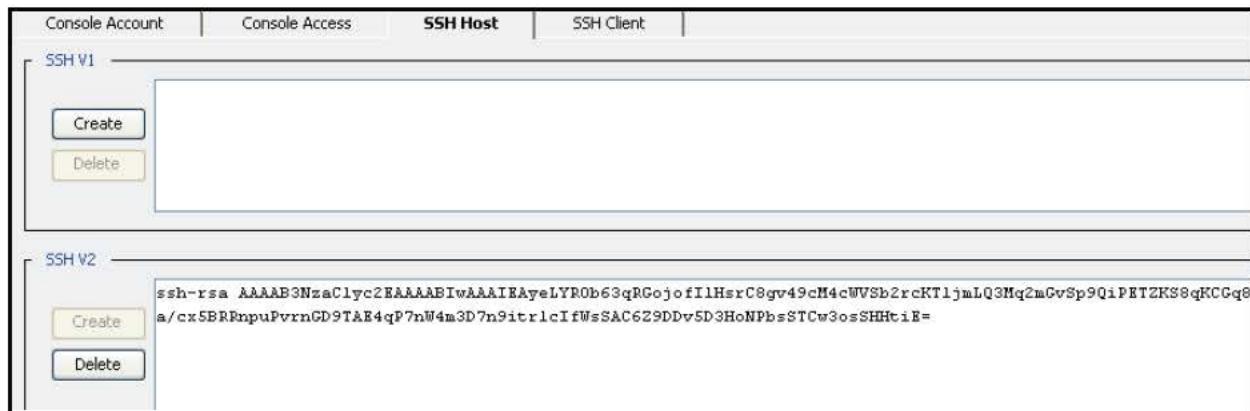
Managing the SSH Host

You can manage the SSH host connection through either the Management Console or the CLI.

To manage the SSH host:

Note: By default, SSHv2 is enabled and assigned to port 22. You do not need to create a new host key unless you want to change the existing configuration.

1. Select Configuration > Authentication > Console Access > SSH Host.



2. To delete either SSHv1 or SSHv2 support on the SG appliance, click the appropriate **Delete** button.

The change is made on the appliance without confirmation. The SSH host tab redisplays with the designated host key deleted.

3. To add SSHv1 or SSHv2 support, select the **Create** checkbox for the version you want.
4. The SSH host key displays in the appropriate pane.

Managing SSH Client Keys

You can import multiple RSA client keys on the SG appliance to allow for actions such as logging on to the appliance from different hosts. An RSA client key can only be created by an SSH client and then imported onto the SG appliance. Many SSH clients are commercially available for UNIX and Windows.

Once you create an RSA client key following the instructions of your SSH client, you can import the key onto the SG appliance using either the Management Console or the CLI. (For information on importing an RSA key, see “To import RSA client keys” on page 19.)

Understanding OpenSSH.pub Format

Blue Coat supports the OpenSSH.pub format. Keys created in other formats will not work.

An OpenSSH.pub public key is similar to the following:

```
ssh-rsa AAAAB3NzaC1yc2EAAAABIwAAQIEAwFI78MKyvL8DrFgcVxpNRHMFkJrBMeBn
2PKcv5oAJ2qz+uZ7hiv7Zn43A6hXwY+DekhtNLOk3HCWmgsrDBE/NOOEnDpLQjBC6t/
T3cSQKZjh3NmBbpE4U49rPduiufvWkuoEiHUb5y1zRGdXRSNJHxxmg5LiGEiKaoELJfsD
Mc= user@machine
```

One of the public key format examples (this one created by the SSH client) is similar to the following:

```
---- BEGIN SSH2 PUBLIC KEY ----
Comment: "[1024-bit rsa, user.name@machine, Wed Feb 19 2003
19:2\8:09]"
AAAAB3NzaC1yc2EAAAADAQABAAAQQCw52JeWr6Fv4kLkzbPZePvapCpaTadPYQwqsGnCI
Ydf1We7/8336EmzV918G1jbVT1SI1tM1Ku1BTal7uWAi+aUBGKL1 YuyhCTo03
I2FMnsQC7QYzY1y3jufUP3H0be52fg7n7p7gNZR11yzWhVeilvIKiyVKpjqiq6hxCbMb2Q
===
---- END SSH2 PUBLIC KEY ----
```

The OpenSSH.pub format appends a space and a user ID to the end of the client key.

The user ID used for each key must be unique.

Other caveats:

- 1024 bits is the maximum supported key size.
- An *ssh-rsa* prefix must be present.
- Trailing newline characters must be removed from the key before it is imported.

To import RSA client keys:

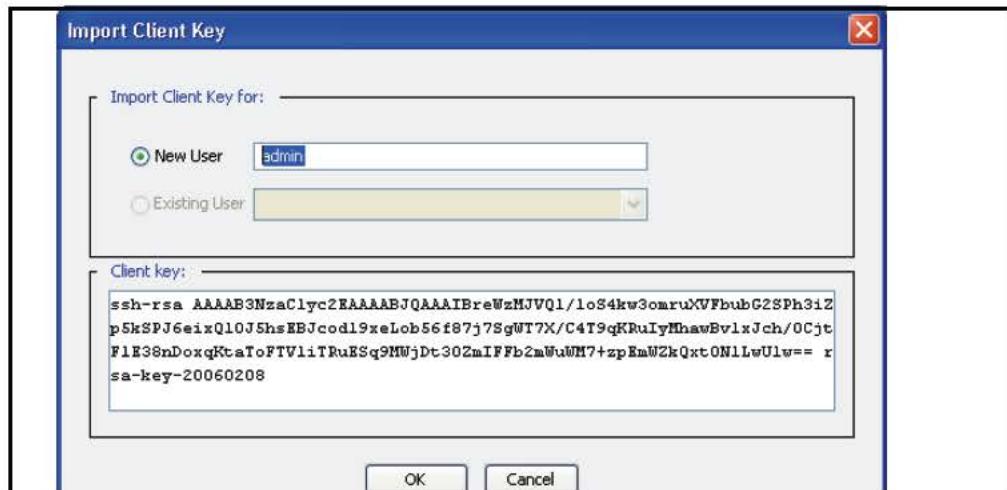
1. From your SSH client, create a client key and copy it to the clipboard.

Note: The above step must be done with your SSH client. The SG appliance cannot create client keys.

2. Select Configuration > Authentication > Console Access > SSH Client.

Console Account	Console Access	SSH Host	SSH Client	
<input checked="" type="checkbox"/> Import Client Key <input type="button" value="Import"/> <input type="text" value="New SSH Client Key"/>				
<input checked="" type="checkbox"/> Delete Client Key Username: <input type="text" value="None"/> Keypair: <input type="text" value="None"/> <input type="button" value="Delete"/> Fingerprint: N/A				

3. Click **Import** to import a new host key.



4. Specify whether the client key is associated with an existing user or a new user, and enter the name.
5. Paste the RSA key that you previously created with an SSH client into the **Client key** field. Ensure that a key ID is included at the end. Otherwise, the import fails.
6. Click **OK**.

The SSH Client tab reappears, with the fingerprint (a unique ID) of the imported key displayed.

The screenshot shows the SGOS interface with the "SSH Client" tab selected. It includes sections for "Import Client Key" (with an "Import" button and "New SSH Client Key" link) and "Delete Client Key". Under "Delete Client Key", there's a table with columns for "Username" (set to "director") and "Keypair" (set to "director@200-2234567.00d0:8903.3c47.sshv2"). A "Delete" button is also present. At the bottom, the "Fingerprint" is shown as "0A:0F:3D:54:61:64:60:FA:10:EF:80:43:7A:E0:54:37".

7. Select **Apply** to commit the changes to the SG appliance.

Relevant CLI Syntax to Manage the SSH Host and Client

SGOS (config) **ssh-console**

- The following subcommands are available:

```
SGOS (config ssh-console) create host-keypair {sshv1| sshv2 | <Enter>}
SGOS (config ssh-console) delete {client-key username key_id | legacy-client-key key_id | director-client-key key_id | host-keypair {sshv1 | sshv2 | <Enter>}}
SGOS (config ssh-console) inline {client-key <eof> | director-client-key <eof>}
SGOS (config ssh-console) view {client-key | director-client-key | host-public-key | user-list | versions-enabled}
```

Notes on Managing the Telnet Console

The Telnet console allows you to connect to and manage the SG appliance using the Telnet protocol. Remember that Telnet is an insecure protocol and therefore should be used only in very secure environments. By default, the Telnet Console is not created.

Blue Coat Systems recommends against using Telnet because of the security hole it creates.

Note: If you do enable the Telnet console, be aware that you cannot use Telnet everywhere in the CLI. Some modules, such as SSL, respond with the error message:

Telnet sessions are not allowed access to ssl commands.

By default a Telnet shell proxy service exists on the default Telnet port (23). Since only one service can use a specific port, you must delete the shell service if you want to create a Telnet console. Be sure to apply any changes before continuing. If you want a Telnet shell proxy service in addition to the Telnet console, you can re-create it later on a different port. For information on the Telnet service, see [Chapter 10: "Managing Shell Proxies" on page 121](#).

To create a new Telnet console service or edit an existing one, see “About Console Services” on page 13.

Note: To use the Telnet shell proxy (to communicate with off-proxy systems) *and* retain the Telnet Console, you must either change the Telnet shell proxy to use a transparent Destination IP address, or change the destination port on either the Telnet Console or Telnet shell proxy. Only one service is permitted on a port. For more information on the Telnet shell proxy, see [Chapter 10: "Managing Shell Proxies" on page 121](#).

Chapter 3: About Proxy Services

Proxy services define the ports and addresses where the SG appliance listens for incoming requests. A variety of attributes for each service can be defined. Each service can be applied to all IP addresses or limited to a specific set of addresses and port combinations. A number of default services are predefined. Additional services can be defined on other ports.

After setting up and enabling the proxy service, the next step is to configure the proxy for your environment. If necessary, you can configure bypass lists for transparent proxy environments.

This chapter discusses:

- “Understanding a Proxy Listener” on page 23
- “Proxy Services” on page 23
- “Bypass List” on page 30

Understanding a Proxy Listener

A proxy listener is the location where the SG listens for traffic for a specific service. A proxy listener can be identified by any destination IP/subnet and port range, and multiple listeners can be added for each service.

Note: A proxy listener should not be confused with the default proxy listener, a service that intercepts all traffic not otherwise intercepted by other listeners.

Four settings are available (some settings are not available for some proxy listeners):

- <All>: All IP addresses are intercepted.
- <Transparent>: Only connections to destination addresses that do not belong to the SG appliance are intercepted
- <Explicit>: Only destinations addresses that match one of the IP addresses on the SG appliance are intercepted.
- Specific IP address or subnet: Only destination addresses matching the IP address and subnet are intercepted.

Proxy Services

The following table lists the default SG appliance services and their default listeners. If you have an upgraded appliance, all services existing before the upgrade are preserved.

Note: Console services, used to manage the SG appliance, are not discussed in this chapter. For information on the four console services—HTTP, HTTPS, SSH, and Telnet—see Chapter 2: “About Console Services” on page 13.

Table 3-1. Proxy Name and Listeners

Service Name	Proxy	Destination IP Address	Port Range	Configuration Discussed
AOL-IM	AOL-IM	<All>	5190	<i>Volume 4: Web Communication Proxies: Chapter 2: "Managing Instant Messaging Protocols" on page 9</i>
CIFS	CIFS	<Transparent>	445, 139	Chapter 4: "Managing the CIFS Proxy" on page 35
Citrix ICA	TCP-Tunnel	<Transparent>	1494	Chapter 13: "Managing the TCP Tunneling Proxy" on page 163
DNS	DNS	<All>	53	Chapter 5: "Managing the DNS Proxy" on page 51
Endpoint Mapper	Endpoint Mapper	<All>	135	Chapter 6: "Managing the Endpoint Mapper and MAPI Proxies" on page 55
FTP	FTP	<All>	21	Chapter 7: "Managing the FTP Proxy" on page 69
HTTP	HTTP	<All>	80	Chapter 8: "Managing the HTTP Proxy" on page 77
		<Explicit>	8080	
HTTPS	SSL	<All>	443	Chapter 12: "Managing the SSL Proxy" on page 137
IMAP	TCP-Tunnel	<Transparent>	143	Chapter 13: "Managing the TCP Tunneling Proxy" on page 163
IMAPS	TCP-Tunnel	<Transparent>	993	Chapter 13: "Managing the TCP Tunneling Proxy" on page 163
Kerberos	TCP-Tunnel	<Transparent>	88	Chapter 13: "Managing the TCP Tunneling Proxy" on page 163
LDAP	TCP-Tunnel	<Transparent>	389	Chapter 13: "Managing the TCP Tunneling Proxy" on page 163
LPD	TCP-Tunnel	<Transparent>	515	Chapter 13: "Managing the TCP Tunneling Proxy" on page 163
Lotus Notes	TCP-Tunnel	<Transparent>	1352	Chapter 13: "Managing the TCP Tunneling Proxy" on page 163
MMS	MMS	<All>	1755	<i>Volume 4: Web Communication Proxies: Chapter 3: "Managing Streaming Media" on page 33</i>
MS SQL Server	TCP-Tunnel	<Transparent>	1433	Chapter 13: "Managing the TCP Tunneling Proxy" on page 163

Table 3-1. Proxy Name and Listeners (Continued)

Service Name	Proxy	Destination IP Address	Port Range	Configuration Discussed
MS Terminal Services	TCP-Tunnel	<Transparent>	3389	Chapter 13: "Managing the TCP Tunneling Proxy" on page 163
MSN-IM	MSN-IM	<All>	1863, 6891	<i>Volume 4: Web Communication Proxies:</i> "Chapter 2: Managing Instant Messaging Protocols" on page 9
MySQL	TCP-Tunnel	<Transparent>	3306	Chapter 13: "Managing the TCP Tunneling Proxy" on page 163
NFS	TCP-Tunnel	<Transparent>	2049	Chapter 13: "Managing the TCP Tunneling Proxy" on page 163
Novell GroupWise	TCP-Tunnel	<Transparent>	1677	Chapter 13: "Managing the TCP Tunneling Proxy" on page 163
Novell NCP	TCP-Tunnel	<Transparent>	524	Chapter 13: "Managing the TCP Tunneling Proxy" on page 163
Oracle	TCP-Tunnel	<Transparent>	1521, 1525	Chapter 13: "Managing the TCP Tunneling Proxy" on page 163
POP3	TCP-Tunnel	<Transparent>	110	Chapter 13: "Managing the TCP Tunneling Proxy" on page 163
POP3S	TCP-Tunnel	<Transparent>	995	Chapter 13: "Managing the TCP Tunneling Proxy" on page 163
RTSP	RTSP	<All>	554	<i>Volume 4: Web Communication Proxies:</i> "Chapter 3: Managing Streaming Media" on page 33
Shell	TCP-Tunnel	<Transparent>	514	Chapter 13: "Managing the TCP Tunneling Proxy" on page 163
SMTP	TCP-Tunnel	<Transparent>	25	Chapter 13: "Managing the TCP Tunneling Proxy" on page 163
SOCKS		<Explicit>	1080	Chapter 11: "Managing a SOCKS Proxy" on page 129
SSH	TCP-Tunnel	<Transparent>	22	Chapter 13: "Managing the TCP Tunneling Proxy" on page 163
Sybase SQL	TCP-Tunnel	<Transparent>	1498	Chapter 13: "Managing the TCP Tunneling Proxy" on page 163
Telnet	Telnet	<All>	23	Chapter 10: "Managing Shell Proxies" on page 121
VNC	TCP-Tunnel	<Transparent>	5900	Chapter 13: "Managing the TCP Tunneling Proxy" on page 163

Table 3-1. Proxy Name and Listeners (Continued)

Service Name	Proxy	Destination IP Address	Port Range	Configuration Discussed
XWindows	TCP-Tunnel	<Transparent>	6000-6002	Chapter 13: "Managing the TCP Tunneling Proxy" on page 163
Yahoo-IM	Yahoo-IM	<All>	5050, 5101	Volume 4: Web Communication Proxies: "Chapter 2: Managing Instant Messaging Protocols" on page 9
Default (Listens on all unattended ports)	TCP-Tunnel	<Transparent>	<All>	Chapter 13: "Managing the TCP Tunneling Proxy" on page 163

The HTTPS Reverse Proxy service is also available but not created by default. When created, it defaults to an <Explicit> destination IP address on port 443. For information on configuring the HTTPS Reverse Proxy, see [Chapter 9: "Creating and Editing an HTTPS Reverse Proxy Service" on page 113](#).

Understanding Multiple Listeners

A listener identifies network traffic based on a destination IP address criterion, a destination port or port range and an action to perform on that traffic. Multiple listeners can be defined for a proxy service or console service. Each service has a set of default actions to apply to the traffic identified by the listeners it owns.

The destination IP address of a connection can match multiple proxy service listeners. Multiple matches are resolved using the most-specific match algorithm used by routing devices. A listener is more specific if it has a larger Destination IP subnet prefix. For example, the subnet 10.0.0.0/24 is more specific than 10.0.0.0/16, which is more specific than 10.0.0.0/8.

When a new connection is established, the SG appliance first finds the most specific listener Destination IP. If a match is found, and the destination Port also matches, the connection is then handled by that listener. If the destination Port of the listener with the most specific Destination IP does not match, the next most-specific Destination IP is found; this process continues until either a complete match is found or no more matching addresses are found.

For example, assume the following services were defined:

Table 3-2. Example Configuration for Most Specific Match Algorithm

Proxy Service		Listener	
Service Name	Proxy	Destination IP Address	Port Range
New York Data Center	HTTP	10.167.10.0/24	80
New York CRM	HTTP	10.167.10.2/32	80
HTTP Service	HTTP	<Transparent>	80

An HTTP connection initiated to server 10.167.10.2 could match any of the three listeners in the above table. The most specific match algorithm finds that a listener in the New York CRM service is the most specific and since the destination port of the connection and the listener match, the connection is handled by this service.

The advantage of the most specific match algorithm becomes evident when at some later point another server is added in the New York Data Center subnet. If that server needs to be handled by a different service than the New York Data Center service, a new service with a listener specific to the new server would be added. The administrator does not need to be concerned about rule order in order to intercept traffic to this particular server using the new, most specific service listener.

About Service Attributes

The service attributes define the default parameters the SG appliance uses for a particular service.

The following table describes the attributes for a proxy service; however, depending on the protocol, not all attributes are available for each proxy type.

Table 3-3. Service Attributes

Attribute	Description
Authenticate-401	All transparent and explicit requests received on the port always use transparent authentication (cookie or IP, depending on the configuration). This is especially useful to force transparent proxy authentication in some proxy-chaining scenarios.
CA-Cert List	CA Certificate List used for verifying client certificates.
Detect Protocol	Detects the protocol being used. Protocols that can be detected include: HTTP, P2P (eDonkey, BitTorrent, FastTrack, Gnutella), SSL, and Endpoint Mapper.
Early Intercept	Controls whether the proxy responds to client TCP connection requests before connecting to the upstream server. When early intercept is disabled, the proxy delays responding to the client until after it has attempted to contact the server.
Use ADN	Controls whether ADN is enabled for a specific service. Enabling ADN does not guarantee the connections are accelerated by ADN. The actual enable decision is determined by ADN routing (for explicit deployment) and network setup (for transparent deployment).
Forward Client Cert	When used with the verify-client attribute, puts the extracted client certificate information into a header that is included in the request when it is forwarded to the OCS. The name of the header is Client-Cert. The header contains the certificate serial number, subject, validity dates and issuer (all as name=value pairs). The actual certificate itself is not forwarded.
Optimize Bandwidth	Controls whether to optimize bandwidth usage when connecting upstream using an ADN tunnel.
Reflect Client IP	Enables the sending of the client's IP address instead of the SG appliance's IP address to the upstream server. If you are using an Application Delivery Network (ADN), this setting is enforced on the concentrator proxy through the Configuration > App. Delivery Network > Tunneling tab. For more information, refer to <i>Volume 6: Advanced Networking</i> .
SSL Versions	Allows you to select which versions of SSL you want to support. The default is to support SSL v2, v3, and TLS. This attribute is available for HTTPS Reverse Proxy.

Table 3-3. Service Attributes (Continued)

Attribute	Description
Verify Client	Requests and validates the SSL client certificate. This attribute is available for HTTPS Reverse Proxy.

Understanding Access Logging with Proxy Services

The access log has one field that contains the service name.

- `x-service-name` (ELFF token) `service.name` (CPL token) The name of the service used to intercept this connection.

Note: The `x-service-name` field replaces the `s-sitename` field. The `s-sitename` field can still be used for backward compatibility with squid log formats, but it has no CPL equivalent.

Creating or Editing a Proxy Service

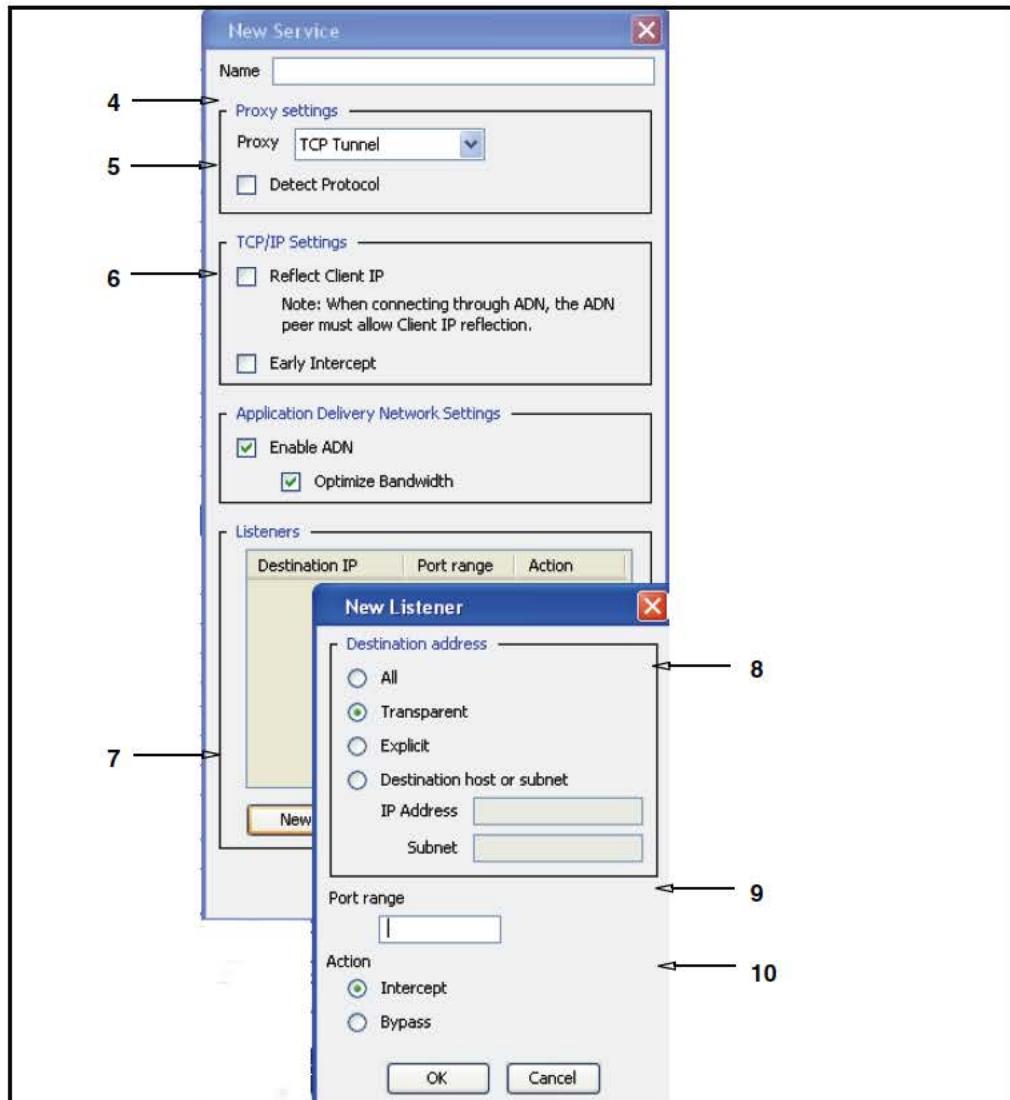
The basic procedure for creating or editing a proxy service is shown below. For additional information on managing a specific proxy, including the proxy service and the proxy configuration, see:

- Chapter 4: "Managing the CIFS Proxy" on page 35
- Chapter 5: "Managing the DNS Proxy" on page 51
- Chapter 6: "Managing the Endpoint Mapper and MAPI Proxies" on page 55
- Chapter 7: "Managing the FTP Proxy" on page 69
- Chapter 8: "Managing the HTTP Proxy" on page 77
- Chapter 9: "Creating and Editing an HTTPS Reverse Proxy Service" on page 113
- Chapter 10: "Managing Shell Proxies" on page 121
- Chapter 11: "Managing a SOCKS Proxy" on page 129
- Chapter 12: "Managing the SSL Proxy" on page 137
- Chapter 13: "Managing the TCP Tunneling Proxy" on page 163

To edit or create a proxy service:

1. Select **Configuration > Services > Proxy Services**.
2. To edit a specific proxy service, highlight the service and click **Edit**.
3. To create a new proxy service, click **New**.

Note: If you only want to change the proxy's behavior from bypass (the default) to intercept, go to the **Action** column of the **Proxy Services** pane, select the service whose behavior you want to change, and select **Intercept** from the drop-down list. You do not need to enter **New/Edit** mode to change this setting.



4. In the **Name** field, choose a meaningful name for the new proxy service.
5. In the **Proxy Settings** field, select the type of proxy service. The settings below the **Proxy** field change depending on the kind of proxy you select. (This example is using the TCP-Tunnel proxy.)
6. Select or de-select the checkboxes, as appropriate, for the service being set up. (For information on the various attributes, see [Table 3-3, “Service Attributes,” on page 27](#).)
7. To create a new listener, click **New**.
8. Select a Destination IP address from the radio buttons.
9. In the **Port Range** field, enter the ports on which the service should listen. The default ports for each service are discussed in the chapter for each proxy.
10. Select the default action for the service: **Bypass** tells the service to ignore any traffic matching this listener. **Intercept** configures the service to intercept and proxy the associated traffic.
11. Click **OK**; click **Apply**.

Relevant CLI Syntax to Create/Edit a Proxy Service:

- To enter configuration mode for the service:

```
SGOS#(config) proxy-services
SGOS#(config proxy-services) create service-type service-name
SGOS#(config proxy-services) edit service-name
```

- The following subcommands are available:

```
SGOS#(config service-name) add {transparent | explicit | all |
ip_address | ip_address/subnet-mask} {port | first_port-last_port}
[intercept | bypass]
SGOS#(config service-name) attribute {authenticate-401 | adn-optimize
| ccl | cipher-suite | detect-protocol | early-intercept | forward-
client-cert | keyring | reflect-client-ip | ssl-versions | use-adn |
verify-client}
SGOS#(config service-name) bypass {transparent | explicit | all |
ip_address | ip_address/subnet-mask} {port | first_port-last_port}
SGOS#(config service-name) intercept {transparent | explicit | all |
ip_address | ip_address/subnet-mask} {port | first_port-last_port}
SGOS#(config service-name) remove {transparent | explicit | all |
ip_address | ip_address/subnet-mask} {port | first_port-last_port}
```

Viewing the Proxy Services

The **Proxy Services** pane in the **Configuration > Services** tab contains the list of all services created on the appliance. You can sort the list several ways:

- Using the Display Filter at the top of the pane. The drop-down list contains the various proxy names and the bypass/intercept actions. You can select the item you want to filter on.
- Clicking the appropriate column title at the top of the table to sort on the column you want.

Bypass List

The bypass list contains IP addresses/subnet masks of client and server workstations. Used only in a transparent proxy environment, the bypass list allows the SG appliance to skip processing requests sent from specific clients to specific servers. The list allows traffic between protocol incompliant clients and servers to pass through the SG appliance without a disruption in service.

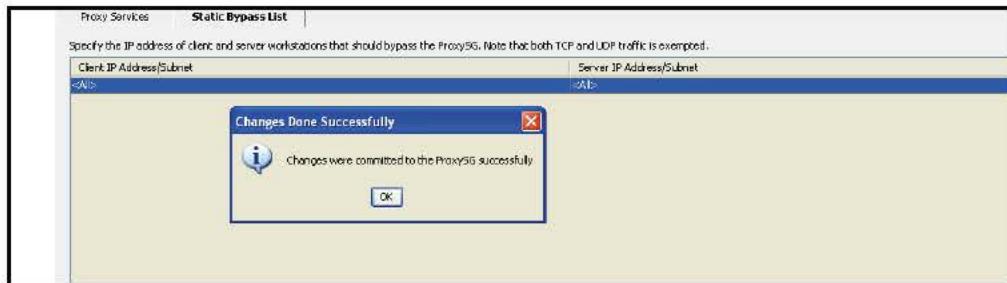
Note: This prevents the appliance from enforcing any policy on these requests and disables any caching of the corresponding responses. Because bypass entries bypass Blue Coat policy, use bypass sparingly and only for specific situations.

Adding Static Bypass Entries

You can add entries to prevent the requests from specified systems from being intercepted by the SG appliance.

Note: Dynamic bypass cannot be configured through the Management Console. It can only be configured through policy or the CLI. For more information, see “[Using Policy to Configure Dynamic Bypass](#)” on page 31.

1. Select **Configuration > Services > Proxy Services > Bypass List**.
2. Click **New** to create a new list entry; click **Edit** to modify a list entry.



3. Fill in the fields:
 - a. Select a source IP address from the drop-down list or choose **<All>**. Add the subnet mask.
 - b. Select a destination IP address from the drop-down list or choose **<All>**. Add the subnet mask.
4. Click **OK**; click **Apply**.

Relevant CLI Syntax to Manage Static Bypass Entries

- To configure the service:

```
SGOS#(config) proxy-services
SGOS#(config proxy-services) static-bypass
```

- The following subcommands are available:

```
SGOS#(config static-bypass) add {all | client_ip_address |
client_ip_address/subnet-mask} {all | server_ip_address |
server_ip_address/subnet-mask}
SGOS#(config static-bypass) remove {all | client_ip_address |
client_ip_address/subnet-mask} {all | server_ip_address |
server_ip_address/subnet-mask}
SGOS#(config static-bypass) view {filter {* | all | client_ip_address |
client_ip_address/subnet-mask} {* | all | server_ip_address |
server_ip_address/subnet-mask} | <Enter>}
```

Using Policy to Configure Dynamic Bypass

Dynamic bypass, available through policy (VPM or CPL), can automatically compile a list of response URLs that return various kinds of errors.

Note: Because bypass entries bypass Blue Coat policy, the feature should be used sparingly and only for specific situations.

Dynamic bypass keeps its own (dynamic) list of which connections to bypass, where connections are identified by both source and destination. Dynamic bypass can be based on any combination of policy triggers. In addition, some global settings can be used to selectively enable dynamic bypass based on specific HTTP response codes. After an entry exists in the dynamic bypass table for a specific source/destination IP pair, all connections from that source IP to that destination IP are bypassed in the same way as connections that match against the static bypass list.

For a configured period of time, further requests for the error-causing URLs are sent immediately to the origin content server (OCS), bypassing the SG appliance. The amount of time a dynamic bypass entry stays in the list and the types of errors that cause the SG appliance to add a site to the list, as well as several other settings, are configurable from the CLI.

Once the dynamic bypass timeout for a client and server IP address entry has ended, the SG appliance removes the entry from the bypass list. On the next client request for the client and server IP address, the SG appliance attempts to contact the OCS. If the OCS still returns an error, the entry is once again added to the local bypass list for the configured dynamic bypass timeout. If the entry does not return an error, the request is handled in the normal manner.

Notes

- Dynamic bypass entries are lost when the SG appliance is restarted.
- No policy enforcement occurs on client requests that match entries in the dynamic or static bypass list.
- If a site that requires forwarding policy to reach its destination is entered into the bypass list, the site is inaccessible.

Configuring Dynamic Bypass

Dynamic bypass is disabled by default. Enabling and fine-tuning dynamic bypass is a two-step process:

- Set the desired dynamic bypass timeout and threshold parameters.
- Use policy (recommended) or the CLI to enable dynamic bypass and set the types of errors that cause dynamic bypass to add an entry to the bypass list.

Adding Dynamic Bypass Parameters to the Local Bypass List

The first step in configuring dynamic bypass is to set the `server-threshold`, `max-entries`, or `timeout` values.

Note: This step is optional because the SG appliance uses default configurations if you do not specify them. Use the default values unless you have specific reasons for changing them. Contact Blue Coat Technical Support for detailed advice on customizing these settings.

- The `server-threshold` value defines the maximum number of client entries before the SG appliance consolidates client-server pair entries into a single server entry that then applies to all clients connecting to that server. The range is 1 to 256. The default is 16. When a consolidation occurs, the lifetime of the consolidated entry is set to the value of `timeout`.
- The `max-entries` defines the maximum number of total dynamic bypass entries. The range is 100 to 50,000. The default value is 10,000. When the number of entries exceeds the `max-entries` value, the oldest entry is replaced by the newest entry.
- The `timeout` value defines the number of minutes a dynamic bypass entry can remain unreferenced before it is deleted from the bypass list. The range is 1 to 86400. The default value is 60.

Enabling Dynamic Bypass and Specifying Triggers

Enabling dynamic bypass and specifying the types of errors that causes a URL to be added to the local bypass list are done with the CLI. You cannot use the Management Console.

Using policy to enable dynamic bypass and specify trigger events is better than using the CLI, because the CLI has only a limited set of responses. For information on available CLI triggers, refer to the *Volume 12: Blue Coat SG Appliance Command Line Reference*. For information on using policy to configure dynamic bypass, refer to the *Volume 11: Blue Coat SG Appliance Content Policy Language Guide*.

Bypassing Connection and Receiving Errors

In addition to setting HTTP code triggers, you can enable connection and receive errors for dynamic bypass.

If `connect-error` is enabled, any connection failure to the origin content server (OCS), including timeouts, inserts the OCS destination IP address into the dynamic bypass list.

If `receive-error` is enabled, when the cache does not receive an HTTP response on a successful TCP connection to the OCS, the OCS destination IP address is inserted into the dynamic bypass list. Server timeouts can also trigger `receive-error`. The default timeout value is 180 seconds, which can be changed (refer to *Volume 2: Getting Started*).

Related CLI Syntax to Enable Dynamic Bypass and Trigger Events

- To enter configuration mode for the service:

```
SGOS#(config) proxy-services
SGOS#(config proxy-services) dynamic-bypass
SGOS#(config dynamic-bypass) {enable | disable}
SGOS#(config dynamic-bypass) max-entries number
SGOS#(config dynamic-bypass) server-threshold number
SGOS#(config dynamic-bypass) trigger {all | connect-error | non-http |
receive-error | 400 | 403 | 405 | 406 | 500 | 502 | 503 | 504}
SGOS#(config dynamic-bypass) timeout minutes
#(config dynamic-bypass) no trigger {all | connect-error | non-http |
receive-error | 400 | 403 | 405 | 406 | 500 | 502 | 503 | 504}
SGOS#(config dynamic-bypass) clear
SGOS#(config dynamic-bypass) view
```


Chapter 4: Managing the CIFS Proxy

This chapter discusses the Common Internet File System (CIFS) protocol and describes how to configure the services and proxy on the SG appliance.

Note: The CIFS protocol is based on the Server Message Block (SMB) protocol used for file sharing, printers, serial ports, and other communications. It is a client-server, request-response protocol.

About CIFS

CIFS allows computers to share files and printers, supports authentication, and is popular in enterprises because it supports all Microsoft operating systems, clients, and servers.

File servers make file systems and other resources (printers, mailslots, named pipes, APIs) available to clients on the network. Clients have their own hard disks, but they can also access shared file systems and printers on the servers.

Clients connect to servers using TCP/IP. After establishing a connection, clients can send commands (SMBs) to the server that allows them to access shares, open files, read and write files—the same tasks as with any file system, but over the network.

CIFS is beneficial because it is generic and compatible with the way applications already share data on local disks and file servers. More than one client can access and update the same file, while not compromising file-sharing and locking schemes. However, the challenge for an enterprise is that CIFS communications are inefficient over low bandwidth lines or lines with high latency, such as in enterprise branch offices. This is because CIFS transmissions are broken into *blocks* of data (typically close to 64 KB). The client must stop and wait for each block to arrive before requesting the next block. Each stop represents time lost instead of data sent. Therefore, users attempting to access, move, or modify documents experience substantial, work-prohibiting delays.

About the Blue Coat CIFS Proxy Solution

The CIFS proxy on the SG appliance combines the benefits of the CIFS protocol with the abilities of the SG appliance to improve performance, reduce bandwidth, and apply basic policy checks. This solution is designed for branch office deployments because network administrators can consolidate their Windows file servers (at the core office) instead of spreading them across the network.

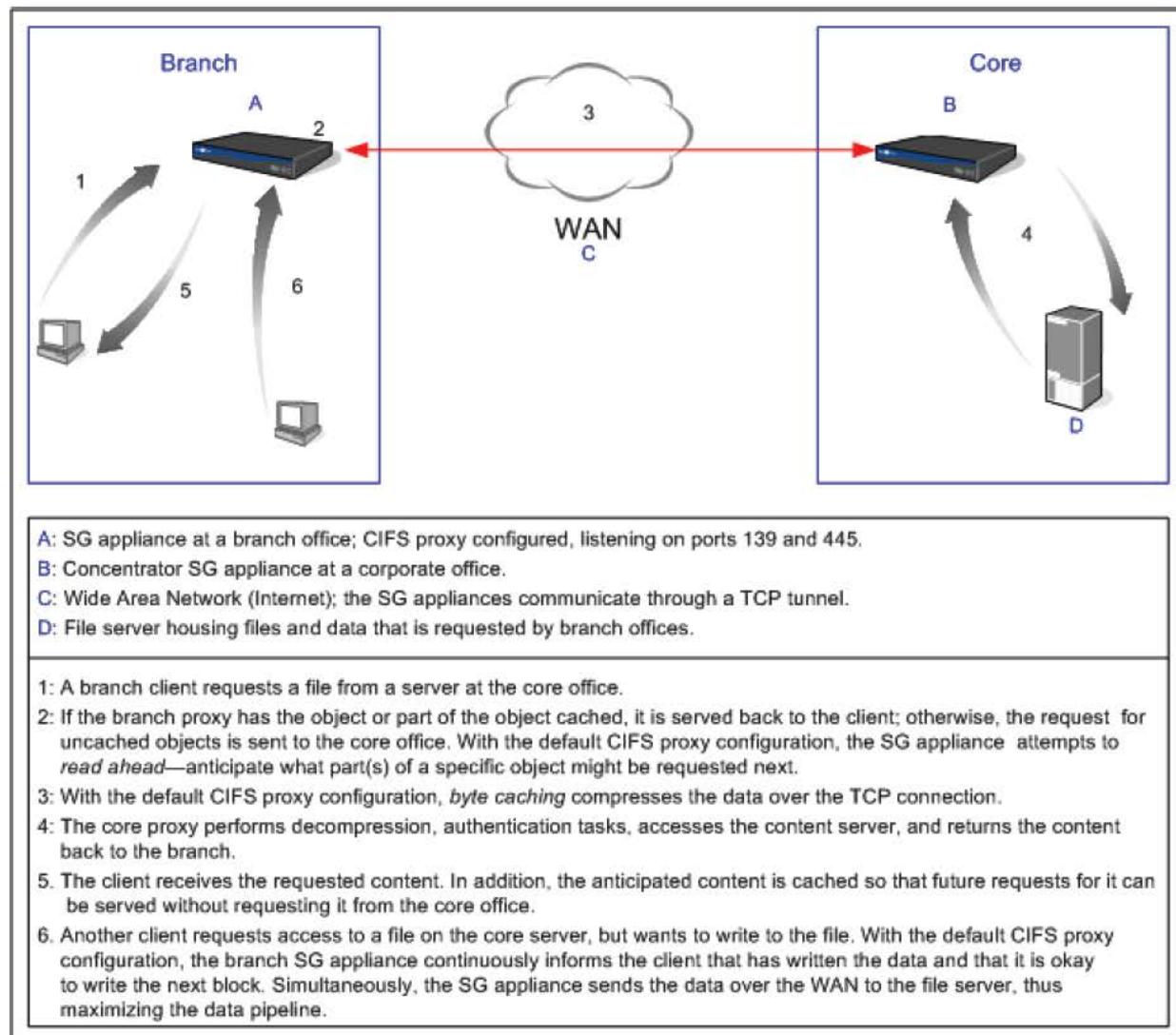


Figure 4-1. CIFS Proxy Traffic and Flow Diagram

Caching Behavior

The CIFS proxy caches the regions of files that are read or written by the client (partial caching) and applies to both read and write file activities. Also, the caching process respects file locking.

Note: Caching behavior can also be controlled with policy.

Authentication

The CIFS proxy supports both server and proxy authentication in the following contexts.

Server Authentication

Permissions set by the origin content server (OCS) are always honored. Requests to open a file are forwarded to the OCS; if the OCS rejects the client access request, no content is served from the cache.

Note: NTLM/IWA authentication requires that the client knows what origin server it is connecting to so it can obtain the proper credentials from the domain controller.

Proxy Authentication

The SG appliance cannot issue a challenge to the user over CIFS, but it is able to make use of credentials acquired by other protocols if IP surrogates are enabled.

Policy Support

The CIFS proxy supports the proxy, cache, and exception policy layers. However, the SMB protocol can only return error numbers. Exception definitions in the forms of strings cannot be seen by an end user. See “[Reference: CPL Triggers, Properties, and Actions](#)” on page 48 for supported CPL triggers and actions.

Access Logging

By default, the SG appliance uses a Blue Coat-derived CIFS access log format.

```
date time c-ip r-ip r-port x-cifs-method x-cifs-server x-cifs-share  
x-cifs-path x-cifs-orig-path x-cifs-client-bytes-read  
x-cifs-server-bytes-read x-cifs-bytes-written x-cifs-file-type  
s-action cs-username cs-auth-group s-ip
```

For a reference list and descriptions of used log fields, see “[Reference: Access Log Fields](#)” on page 46.

WCCP Support

If WCCP is deployed for transparency, you must configure WCCP to intercept TCP ports 139 and 445.

Configuring the SG CIFS Proxy

This section contains the following sub-sections:

- “[About Windows Security Signatures](#)” on page 37
- “[Configuring CIFS Proxy Services](#)” on page 39
- “[Configuring the CIFS Proxy](#)” on page 41
- “[Reviewing CIFS Protocol Statistics](#)” on page 42

About Windows Security Signatures

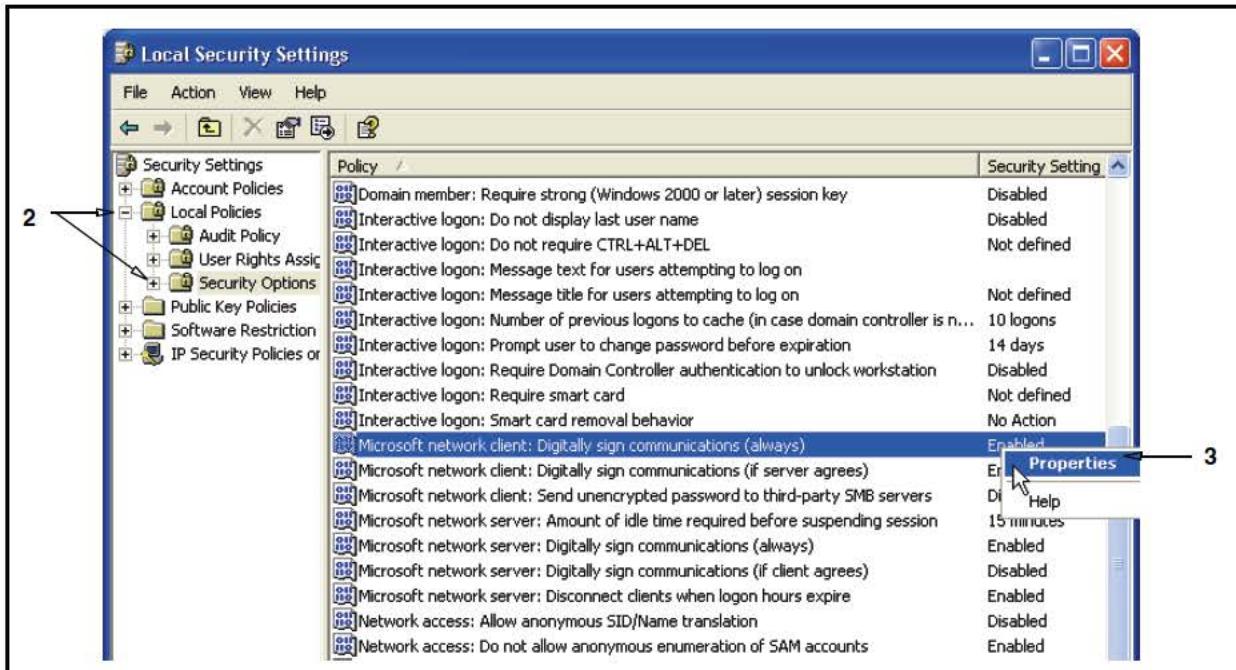
Security signatures prevent the CIFS proxy from providing its full acceleration capabilities. Additionally, security signatures require a considerable amount of processing on both clients and servers. As their benefits are often superseded by link-layer security measures, such as VPNs and restricted network topology, the benefits are minimal and the drawbacks are high. The CIFS proxy requires that security signatures are disabled.

If you know this setting is disabled on your clients or servers, you can proceed to "Configuring CIFS Proxy Services" on page 39.

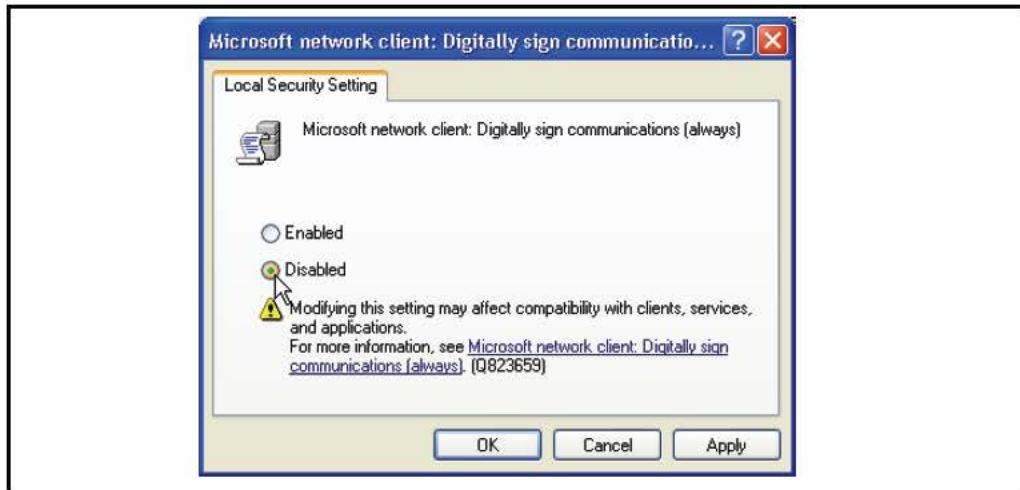
To verify the state of security signatures in Windows; disable if necessary:

Note: This procedure follows the Control Panel Classic View format. The screen shots represent Microsoft Windows XP.

1. In Windows, select Start > Control Panel > Administrative Tools > Local Security Policy. The Local Security Settings dialog appears.



2. Select Local Policies > Security Options.
3. Perform one of the following:
 - Windows XP/2003: Right-click Microsoft network client: Digitally sign communications (always) and select Properties. A configuration dialog appears.
 - Windows 2000: Right-click Digitally sign client communications (always). A configuration dialog appears.



4. Select **Disabled**. Click **Apply** and **OK**.
5. Repeat for the server options:
 - Windows XP/2003: Right-click **Microsoft network server: Digitally sign communications (always)**.
 - Windows 2000: Right-click **Digitally sign server communications (always)**.
6. Close all Control Panel dialogs.

Important: If the server is an ADS/Domain controller, you must set the same security settings for both **Administrative Tools > Domain Controller Security Policy** and **Administrative Tools- > Domain Security Policy**. Otherwise, you cannot open file shares and Group Policy snap-ins on your server.

7. You must reboot the client or server to apply this configuration change.

Configuring CIFS Proxy Services

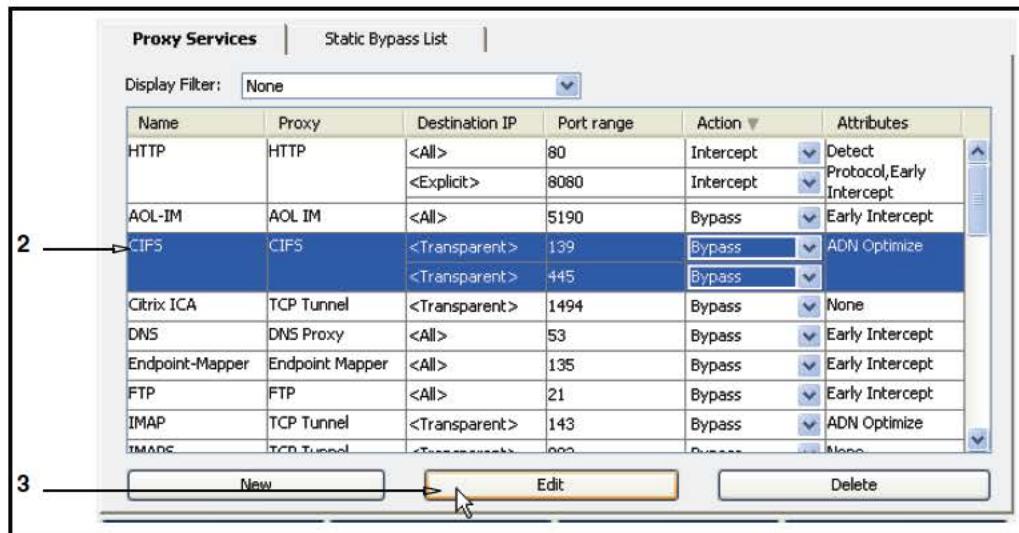
By default (upon upgrade and on new systems), the SG appliance has CIFS services configured for transparent connections on ports 139 and 445. Blue Coat creates listener services on both ports because different Windows operating systems (older versus newer) attempt to connect using 139 or 445. For example, Windows NT and earlier only used 139, but Windows 2000 and later try both 139 and 445. Therefore only configuring one port can potentially cause only a portion of Windows 2000 and newer CIFS traffic to go through the proxy.

A transparent connection is the only supported method; the CIFS protocol does not support explicit connections.

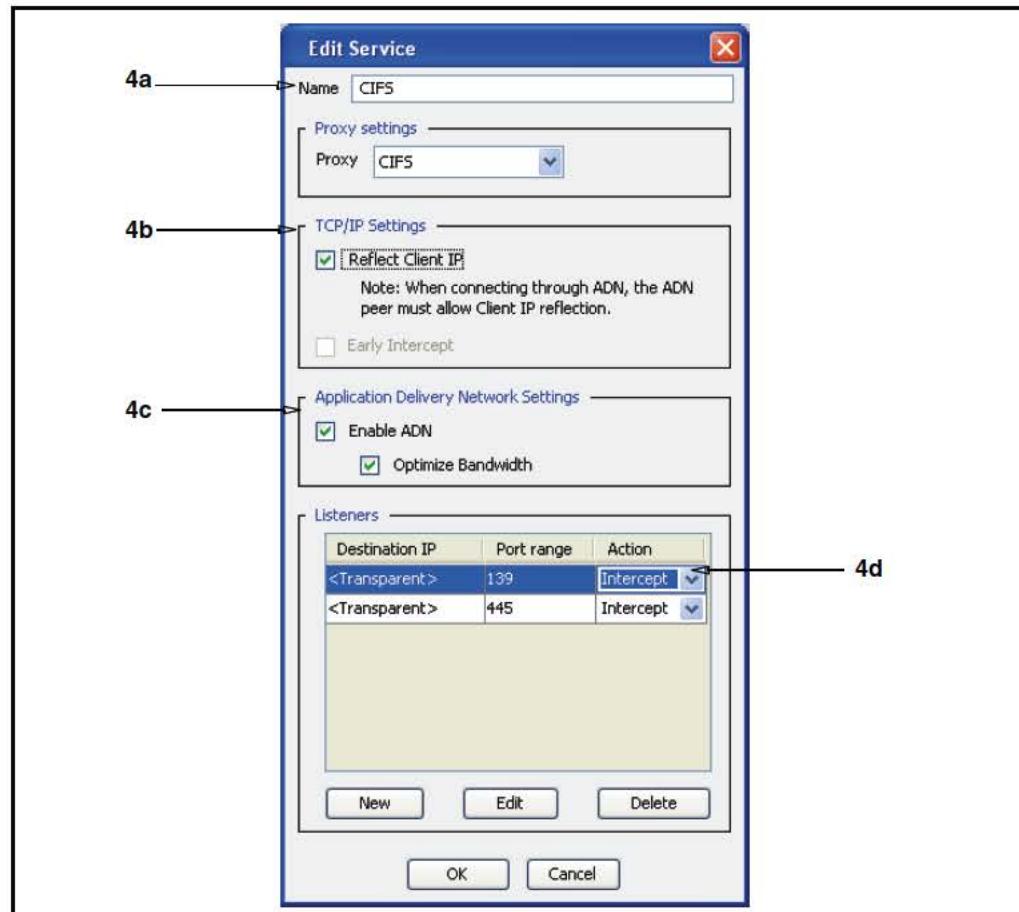
Also, by default these services are configured to accept all IP addresses in **Bypass** mode. The following procedure describes how to change them to **Intercept** mode, and explains other attributes within the service.

To configure the CIFS proxy service attributes:

1. From the Management Console, select **Configuration > Services > Proxy Services**.



2. Scroll the list of services to display the default CIFS service line. Notice the **Action** is **Bypass**. You can select **Intercept** from the drop-down list, but for the purposes of this procedure, select the service line to highlight it.
3. Click **Edit**. The Edit Service dialog appears, with some default settings, is displayed.



4. Understand the service attributes:
 - a. (Optional) The default service name is **CIFS**, which identifies the service type.
 - b. The **TCP/IP Settings** options allow you to manage the data connections:
 - **Reflect Client IP:** If this is enabled, the connection to the CIFS server appears to come from the client, not the SG appliance.
 - **Early Intercept:** You cannot enable **Early Intercept** for the CIFS proxy.
 - c. Enabling the **ADN Optimization** option is recommended by Blue Coat. This feature improves performance by compressing request and response data, which still needs to be forwarded across the WAN. For more information about ADN optimization, refer to *Volume 6: Advanced Networking*.
 - d. In the **Listeners** field, select **Intercept** from the drop-down list; the SG appliance must intercept the CIFS connection. Perform this step for both ports.

Note: You can also change the mode from **Bypass** to **Intercept** from the main services page.

- e. Click **OK**; click **Apply**.

Result: The CIFS service is configured and appears in Management Console.

Name	Proxy	Destination IP	Port range	Action	Attributes
CIFS	CIFS	<Transparent>	139	Intercept	ADN Optimize, Reflect Client IP
		<Transparent>	445	Intercept	
HTTP	HTTP	<All>	80	Intercept	Detect Protocol, Early Intercept
		<Explicit>	8080	Intercept	
AOL-IM	AOL IM	<All>	5190	Bypass	Early Intercept

Now that the CIFS listeners are configured, you can configure the CIFS proxy.

Configuring the CIFS Proxy

The CIFS proxy options configure folder management and file reading and writing. These options are enabled by default because they maximize the benefits of a CIFS proxy deployment. This section describes these options and why they might require changing based on your branch deployment.

To view/change the CIFS proxy configuration options:

1. In the Management Console, select **Configuration > Proxy Settings > CIFS Proxy**.

2. Configure the CIFS proxy options:
 - a. **Read ahead:** Enabled by default, which reduces the latency of the connection. The SG appliance might partially cache a requested object (the part directly requested and viewed by the client). When **Read ahead** is enabled, the appliance attempts to *anticipate* what block of data (up to 64K) might be requested next, fetches it, and caches it.
If applications are performing a large amount of non-sequential file access, disabling **Read Ahead** reduces the amount of unnecessary data being fetched into the cache.
 - b. **Write behind:** Enabled by default. This option applies to when clients attempt to write to a file on the core server. Without the CIFS proxy, a client would experience substantial latency as it sends data chunks and waits for the acknowledgement from the server to write the next data chunks. With this option enabled the branch SG appliance is viewed by the client as the file server; the appliance constantly sends approval to the client and allows the client to write data while the back end takes advantage of the compressed TCP connection and sends the data to the core server.
A reason for disabling this option is the risk of data loss if the link from the branch to the core fails. There is no way to recover queued data if such a link failure occurs.
 - c. **Directory Cache Time:** This option determines how long directory information is kept in cache. Changes made to a directory by clients not using the SG appliance are not visible to SG clients if they occur within this time interval. The default cache time is 30 seconds. Blue Coat recommends keeping this value low to ensure clients have access to the most current directory information; however, you can set it longer if your applications use CIFS to access files. For example, the cache responds faster if it knows directory X does not contain the file and so moves on to directory Y, which reduces the number of round trips to the file server.
3. If you changed any options, click **Apply**.

Enabling CIFS Access Logging

By default, the SG appliance is configured to use the Blue Coat CIFS access log format. Access Logging is enabled on the **Configuration > Access Logging > General** page.

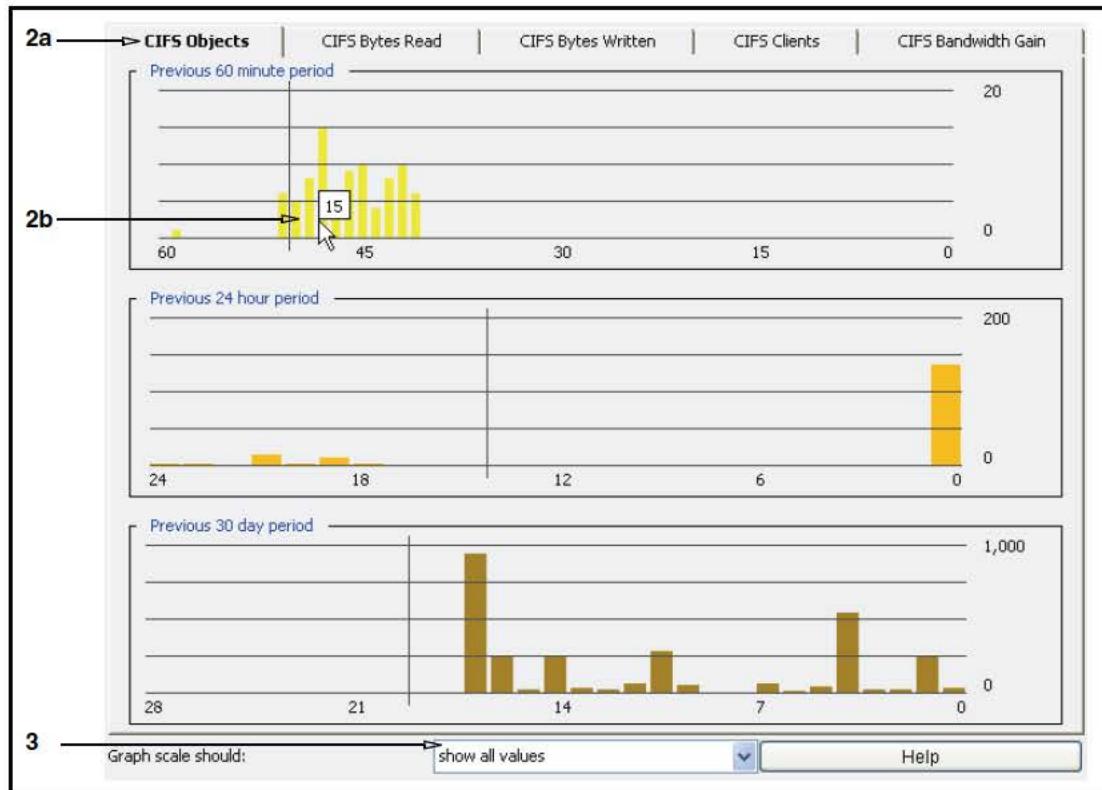
For information about access log customization, refer to *Volume 9: Access Logging*.

Reviewing CIFS Protocol Statistics

After CIFS traffic begins to flow through the SG appliance, you can review the statistics page and monitor results in various CIFS categories. The presented statistics are representative of the client perspective.

To review CIFS statistics:

1. From the Management Console, select **Statistics > CIFS History**.



2. View statistics:
 - a. Select a statistic category tab:
 - **CIFS Objects**: The total number of CIFS-related objects processed by the SG appliance (read and written).
 - **CIFS Bytes Read**: The total number of bytes read by CIFS clients.
 - **CIFS Bytes Written**: The total number of bytes written by CIFS clients (such as updating existing files on servers).
 - **CIFS Clients**: The total number of connected CIFS clients.
 - **CIFS Bandwidth Gain**: The total bandwidth usage for clients (yellow) and servers (blue), plus the percentage gain.
 - b. The graphs display three time metrics: the previous 60 minutes, the previous 24 hours, and the previous 60 days. Roll the mouse over any colored bar to view the exact metric.
3. (Optional) You can change the scale of the graph to display the percentage of bar peaks to display.

Statistic URL Pages

Additional CIFS statistics pages are viewable from Management Console URLs.

Statistics

This page displays various, more granular connection and byte statistics.

https://SG_IP_address:8082/CIFS/statistics

CIFS Statistics

Version 1.0

Current connections	0
Current open file handles	0
Current open directory handles	0
Current open pipe handles	0
Current open other handles	0
Total connections	0
Total open file handles	0
Total open directory handles	0
Total open pipe handles	0
Total open other handles	0
File bytes read by clients	0
File bytes read from servers	0
File bytes written	0
Total messages from clients	0
Total bytes from clients	0
Total messages to servers	0
Total bytes to servers	0
Total messages from servers	0
Total bytes from servers	0
Total messages to clients	0
Total bytes to clients	0

[Reset total statistics](#)

If CIFS traffic interception is occurring (the above screenshot does not represent active traffic), the byte counters increment when a user opens a file or browses around.

Note: The bytes to/from servers counters on the CIFS statistics page do *not* include the effects of compression and byte caching over the WAN link.

Connections

This page displays specific client-to-server connection and file information and statistics.

https://SG_IP_address:8082/CIFS/connection

CIFS Connection Information				
1 connection				
ID	Client Address	Client Bytes	Server Address	Server Bytes
1	10.9.44.70:4620	38,431,726	10.9.100.51:445	23,251,770

Click **connection ID link** to drill down to more details.

CIFS Connection Information										
Type:	Accelerated									
Client address:	10.9.44.70:4620									
Server address:	10.9.100.51:445									
File bytes read by client:	14,850,048									
File bytes read from server:	209,408									
File bytes written:	22,327,520									
Session ID	Server	Share ID	Share	File ID	Path	Type	File size	File bytes read by client	File bytes read from server	Bytes written
0x800	10.9.100.51	0x800	CIFS	0x4000	files	directory				

Reference: Equivalent CIFS Proxy CLI Commands

The Management Console procedures in this chapter have the following equivalent CLI command roots:

- To enter configuration mode for the service:


```
SGOS#(config) proxy-services
SGOS#(config proxy-services) create cifs service-name
SGOS#(config proxy-services) edit service-name
SGOS#(config cifs)
```
- The following subcommands are available:


```
SGOS#(config service-name) add {transparent | ip_address |
ip_address/subnet-mask} {port | first_port-last_port} [intercept |
bypass]
SGOS#(config service-name) attribute {adn-optimize {enable |
disable}| reflect-client-ip {enable | disable}}
SGOS#(config service-name) bypass {transparent | ip_address |
ip_address/subnet-mask} {port | first_port-last_port}
SGOS#(config cifs) {directory-cache-time | read-ahead | write back |
view}
SGOS#(config service-name) exit
SGOS#(config service-name) intercept {transparent | ip_address |
ip_address/subnet-mask} {port | first_port-last_port}
SGOS#(config service-name) remove {transparent | ip_address |
ip_address/subnet-mask} {port | first_port-last_port}
```

```
SGOS#(config service-name) view
```

Reference: Access Log Fields

The default Blue Coat CIFS Access Log fields are:

- ❑ c-ip: IP address of the CIFS client.
- ❑ c-port: The CIFS client port TCP connection.
- ❑ cs-auth-group: One group that an authenticated user belongs to. If a user belongs to multiple groups, the group logged is determined by the Group Log Order configuration specified in VPM. If the Group Log Order is not specified, an arbitrary group is logged. Note that only groups referenced by policy are considered.
- ❑ cs-username: Relative username of a client authenticated to the proxy (for example: not fully distinguished).
- ❑ r-ip: IP address from the outbound server URL.
- ❑ r-port: Port from the outbound server URL, typically 139 or 445.
- ❑ s-action: The logging action (or flow) being one of the following:
 - ALLOWED: CIFS operation passed the policy checkpoint and was also successful.
 - DENIED: CIFS operation failed the policy checkpoint.
 - ERROR: CIFS operation resulted in an error on the server; typically associated with NT (x-cifs-nt-error-code) or DOS error (x-cifs-dos-error-code, x-cifs-dos-error-class).
 - FAILED: CIFS operation was successful on the server but failed on the proxy for some internal reason.
 - SUCCESS: CIFS operation was successful on the server (did not go through policy checkpoint).
- ❑ s-ip: IP address of the appliance on which the client established its connection.
- ❑ x-cifs-client-bytes-read: Total number of bytes read by a CIFS client from the associated resource. For **OPEN/CLOSE**, it is the total for that specific file. For **MOUNT/UNMOUNT**, the total for all files accessed in that share. For **LOGON/LOGOFF**, the total for all files accessed in that session. For **CONNECT/DISCONNECT**, the total for all files accessed during that connection.
- ❑ x-cifs-client-write-operations: Total number of client write operations for this particular resource. The scope is the same as x-cifs-client-read-operations.
- ❑ x-cifs-client-other-operations: Total number of client operations that are not reads or writes for this particular resource. The scope is the same as x-cifs-client-read-operations. **MOUNT/UNMOUNT** might also include operations not tied to a specific open file.
- ❑ x-cifs-bytes-written: Total number of bytes written to the associated resource.
- ❑ x-cifs-dos-error-class: DOS error class generated by server, in hexadecimal.
- ❑ x-cifs-dos-error-code: DOS error code generated by server, in hexadecimal.

- ❑ x-cifs-error-cod: CIFS error code generated by server. If the error code is in NT format, it is a single hexadecimal number of the form 0xNNNNNNNN. If the error code is in DOS format, it is two hexadecimal numbers of the form 0xNN/0xNNNN. The first number is the DOS error class, and the second is the DOS error code. This field is a combination of the x-cifs-nt-error-code, x-cifs-dos-error-class, and x-cifs-dos-error-code.
- ❑ x-cifs-fid: Numeric ID representing a CIFS resource.
- ❑ x-cifs-file-size: Size in bytes of CIFS resource.
- ❑ x-cifs-file-type: The type of file that was opened or closed. Values are `file`, `directory`, `pipe`, or `other`. It is only valid if x-cifs-method is `OPEN`, `CLOSE`, `CLOSE_ON_UNMAP`, `CLOSE_ON_LOGOFF`, `CLOSE_ON_DISCONNECT`, or `CLOSE_ON_PASSTHRU`.
- ❑ x-cifs-method: The method associated with the CIFS request. The list of CIFS methods are:
 - `CONNECT`: For TCP-level connect from client to CIFS server.
 - `DISCONNECT`: For TCP-level connection shutdown.
 - `LOGON`: For `SESSION_SETUP_ANDX` SMB command.
 - `LOGOFF`: For `LOGOFF_ANDX` SMB command.
 - `LOGOFF_ON_PASSTHRU`: For removal of cached session from proxy upon `PASSTHRU`.
 - `LOGOFF_ON_DISCONNECT`: For removal of cached session from proxy upon `DISCONNECT`.
 - `MAP`: For `TREE_CONNECT` SMB command.
 - `UNMAP`: For `TREE_DISCONNECT` SMB command.
 - `UNMAP_ON_LOGOFF`: For removal of cached share from proxy upon `LOGOFF`.
 - `UNMAP_ON_PASSTHRU`: For removal of cached share from proxy upon `PASSTHRU`.
 - `UNMAP_ON_DISCONNECT`: For removal of cached share from proxy upon `DISCONNECT`.
 - `DELETE`: For path-based `DELETE` and `DELETE_DIRECTORY` SMB commands.
 - `DELETE_ON_CLOSE`: For delete-on-close action done on a CIFS resource.
 - `LIST`: For enumerating contents of a directory.
 - `OPEN`: For opening a CIFS resource.
 - `RENAME`: For renaming a CIFS resource.
 - `CLOSE`: For closing a CIFS resource.
 - `CLOSE_ON_UNMAP`: For removal of cached file from proxy upon `UNMAP`.
 - `CLOSE_ON_LOGOFF`: For removal of cached file from proxy upon `LOGOFF`.
 - `CLOSE_ON_PASSTHRU`: For removal of cached file from proxy upon `PASSTHRU`.
 - `CLOSE_ON_DISCONNECT`: For removal of cached file from proxy upon `DISCONNECT`.
 - `PASSTHRU`: For connections which Blue Coat is unable to handle:

- Client or server does not support NTLM 0.12 dialect.
- Security signatures are enabled.
- Client or server does not support Unicode characters.
- The SESSION_SETUP_ANONYMOUS SMB request is malformed (with unknown word count).
- Header portion of some SMB command is malformed.
- NETBIOS header is malformed.
- OPEN_STATS: Log the same fields as CLOSE for gathering time-based activity information on open files. This occurs on a 5 minute interval if there was activity on the file within that interval.
 - x-cifs-nt-error-code: CIFS error code generated by server, in hexadecimal.
 - x-cifs-orig-path: Original path name of resource to be renamed.
 - x-cifs-orig-unc-path: UNC path of original path name of resource to be renamed.
 - x-cifs-path: CIFS resource name as specified in the UNC path.
 - x-cifs-server: CIFS server as specified in the UNC path.
 - x-cifs-server-bytes-read: Total number of bytes read from CIFS server from the associated resource.
 - x-cifs-server-operations: Total number of server operations for this particular resource. The scope is the same as x-cifs-client-read-operations.
 - x-cifs-share: CIFS share name as specified in the UNC path.
 - x-cifs-tid: ID representing instance of an authenticated connection to server resource.
 - x-cifs-uid: ID representing an authenticated user instance.
 - x-cifs-unc-path: CIFS path of form \\server\share\path where path might be empty.
 - x-client-connection-bytes: Number of bytes sent to and received from the client.
 - x-server-connection-bytes: Number of bytes sent to and received from the server. If ADN is used for the server connection, this is the number of bytes before ADN compression is applied.
 - x-server-adn-connection-bytes: Number of bytes sent to and received from the server-side ADN peer if ADN is used for the server connection. If ADN is not used, this is displayed as "-".

Reference: CPL Triggers, Properties, and Actions

The following CPL applies to CIFS policy:

Triggers

- attribute.<name>=, has_attribute.<name>=
- client.address=, client.host=, client.host.has_name=

- client.protocol=smb
- content_management=no
- condition=
- date[.utc]=, day=, hour=, minute=, month=, weekday=, year=, time=
- has_client=
- proxy.address=, proxy.port=, proxy.card=
- raw_url=
- release.*=
- server_url=
- socks.accelerated=smb
- tunneled=
- url=smb://<ip>:<port>/
- user.*=, group=, realm=, authenticated=

Properties and Actions:

- action()
- access_log.*(), log.*(), log_message(), notify_email(), notify_snmp()
- authenticate.*()
- allow, deny, deny.*(), exception.*(), force_deny.*(), force_exception.*()
- bypass_cache()
- detect_protocol(smb), force_protocol(smb)
- forward(), forward.fail_open(), socks_gateway(), socks_gateway.fail_open()
- limit_bandwidth(smb)
- reflect_ip()
- rewrite(url), rewrite(url.host), set(url.port)
- trace.*()

Chapter 5: Managing the DNS Proxy

When a DNS proxy service is enabled, it listens on port 53 for both explicit and transparent DNS domain query requests. By default, the service is created but not enabled.

The DNS does a lookup of the DNS cache to determine if requests can be answered. If yes, the SG appliance responds. If not, the DNS forwards the request to the DNS server list configured on the SG appliance. (To configure the DNS server list, see **Configuration > Network > DNS**.)

Note: The SG appliance is not a DNS server. It does not do zone transfers, and recursive queries are forwarded to other name servers.

For information on managing DNS name servers, refer to *Volume 2: Getting Started*.

Through policy, you can configure the list of resolved domain names (the *resolving name list*) the DNS uses. The domain name in each query received by the SG appliance is compared against the resolving name list. Upon a match, the appliance checks the resolving list. If a domain name match is found but no IP address was configured for the domain, the appliance sends a DNS query response containing its own IP address. If a domain name match is found with a corresponding IP address, that IP address is returned in a DNS query response. All unmatched queries are sent to the name servers configured on the SG appliance.

This chapter discusses:

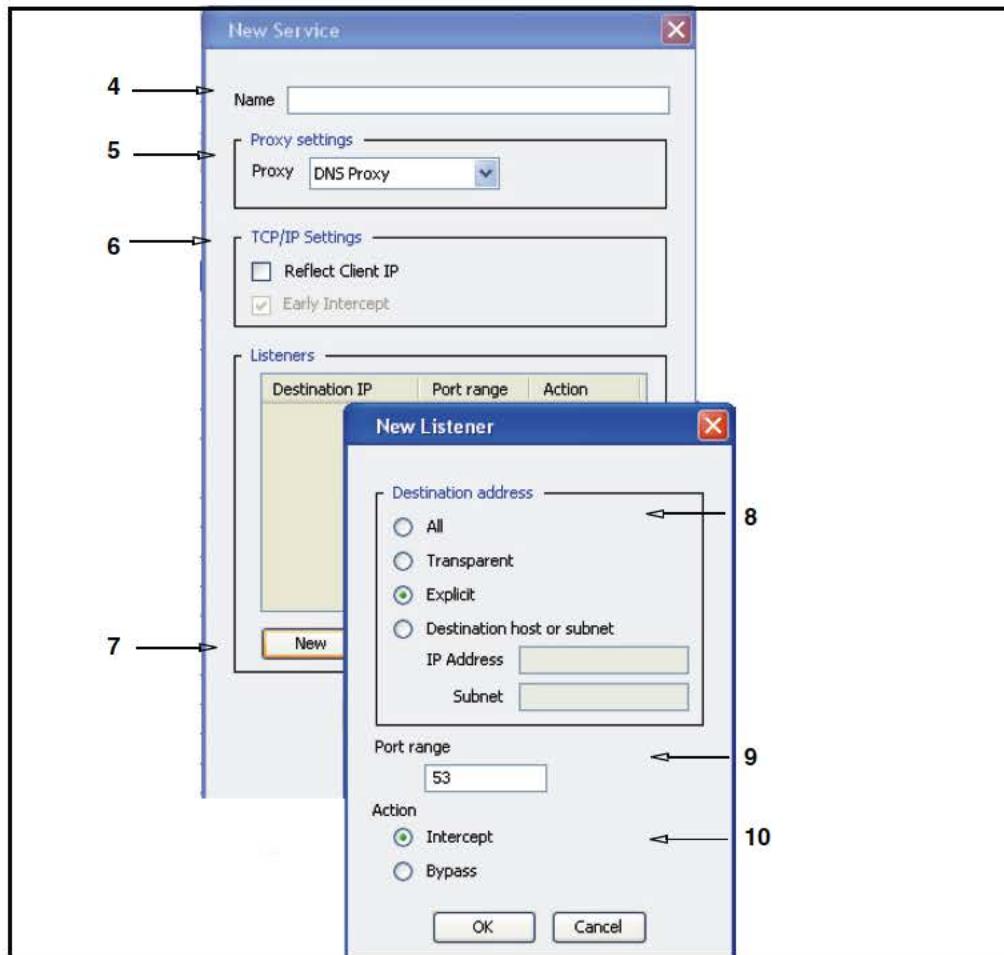
- “Creating or Editing a DNS Proxy Service”
- “Creating a Resolving Name List” on page 53

Creating or Editing a DNS Proxy Service

To create or edit a DNS proxy service:

1. Select **Configuration > Services > Proxy Services**.
2. To edit a specific proxy service, highlight the service and click **Edit**.
3. To create a new proxy service, click **New**.

Note: If you only want to change the proxy’s behavior from bypass (the default) to intercept, go to the **Action** column of the **Proxy Services** pane, select the service whose behavior you want to change, and select **Intercept** from the drop-down list. You do not need to enter **New/Edit** mode to change this attribute.



4. In the **Name** field, choose a meaningful name for the new proxy service.
5. In the **Proxy** field, select DNS Proxy.
6. Select or de-select the checkboxes, as appropriate, for the environment
 - a. **Reflect Client IP**: Enables or disables sending of client's IP address instead of the SG appliance's IP address.
 - b. **Early intercept**: This option cannot be changed when creating or editing a DNS proxy service.
7. To create a new listener, click **New**.
8. Select a Destination IP address from the radio buttons.
9. In the **Port Range** field, enter the ports on which the service should listen. The default port is 53.
10. Select the default action for the service: **Bypass** tells the service to ignore any traffic. **Intercept** configures the service to intercept the traffic that is being proxied.
11. Click **OK**; click **Apply**.

Relevant CLI Syntax to Create/Edit a DNS Proxy Service

- To enter configuration mode for the service:

```
SGOS#(config) proxy-services
SGOS#(config proxy-services) create dns service-name
SGOS#(config proxy-services) edit service-name

□ The following subcommands are available:
```

```
SGOS#(config service-name) add {transparent | explicit | all |
ip_address | ip_address/subnet-mask} {port | first_port-last_port}
[intercept | bypass]
SGOS#(config service-name) attribute reflect-client-ip {enable |
disable}
SGOS#(config service-name) bypass {transparent | explicit | all |
ip_address | ip_address/subnet-mask} {port | first_port-last_port}
SGOS#(config service-name) exit
SGOS#(config service-name) intercept {transparent | explicit | all |
ip_address | ip_address/subnet-mask} {port | first_port-last_port}
SGOS#(config service-name) remove {transparent | explicit | all |
ip_address | ip_address/subnet-mask} {port | first_port-last_port}
SGOS#(config service-name) view
```

Creating a Resolving Name List

You can create the resolving name list that the DNS proxy uses to resolve domain names. This procedure can only be done through policy. (For a discussion on using the <DNS-Proxy> layer, refer to *Volume 11: Blue Coat SG Appliance Content Policy Language Guide*.)

Each name resolving list entry contains a domain-name matching pattern. The matching rules are:

- *test.com* matches only *test.com* and nothing else.
- *.test.com* matches *test.com*, *www.test.com* and so on.
- “.” matches all domain names.

An optional IP address can be added, which allows the DNS proxy to return any IP address if the DNS request's name matches the domain name suffix string (*domain.name*).

To create a resolving name list, create a policy, using the <DNS-Proxy> layer, that contains text similar to the following:

```
<DNS-Proxy>
  dns.request.name=www.example.com dns.respond.a(vip)
-or-
<DNS-Proxy>
  dns.request.name=.example.com dns.respond.a(vip)
-or-
<DNS-Proxy>
  dns.request.name=www.example.com dns.respond.a(10.1.2.3)
```

Note: You can also create a resolving name list using VPM. For more information on using the DNS-Proxy layer in VPM, refer to *Volume 2: Getting Started*.

Chapter 6: Managing the Endpoint Mapper and MAPI Proxies

This chapter discusses the Endpoint Mapper and MAPI proxy solutions, and describes how to configure the services and proxy configuration.

The Endpoint Mapper and MAPI proxies are similar in that they accelerate Microsoft applications across a WAN; however, there are key differences.

This chapter contains the following sections:

- [Section A: "The Endpoint Mapper Proxy Service" on page 56.](#)
- [Section B: "The MAPI Proxy" on page 62.](#)

Section A: The Endpoint Mapper Proxy Service

Section A: The Endpoint Mapper Proxy Service

This section discusses the Microsoft Remote Procedure Call (RPC) protocol and describes how to configure the Endpoint Mapper proxy service on the SG appliance.

About RPC

The Microsoft RPC protocol functions across a client/server model where one application requests a service from another application. The requesting program is the client; the providing service is the server. RPC allows an application on one host (the client) to request and thereby cause an application on another host (the server) to execute an action without the requirement of explicit code. For example: MAPI traffic.

Typically, RPC communications occur when the client contacts the Endpoint Mapper service on that client host to determine how to contact the server. The client provides the RPC service identifier and the Endpoint Mapper service returns the IP and port the client uses to contact the server. Then, the client makes a new TCP connection to that IP and port and sends its RPC request.

The challenges occur when these communications occur between branch offices and servers located in core locations. The user experience is poor because of low available bandwidth or high latency lines.

About the Blue Coat Endpoint Mapper Proxy Solution

The Endpoint Mapper proxy intercepts an RPC client request for a particular RPC service. The Endpoint Mapper proxy looks up the request in its local database, and if there is a match it replies to the client the port number the RPC service is listening on. If it is not in the database, it forwards the request up to the server. The server responds with the port number the service is listening on, and the Endpoint Mapper proxy populates its internal database. It then creates a secondary listener on that RPC port and server IP address, and responds to the RPC client with the port number. When the RPC client connects to the service, the Endpoint Mapper proxy secondary service intercepts the request and tunnels it.

Substantial performance increase occurs because:

- The SG appliance caches server information, negating the requirement to connect to an upstream server for repeated requests.
- The SG appliance at the branch compresses RPC traffic and sends it over the TCP connection to the core SG appliance, which decompresses the data before sending it to the RPC server.

The Endpoint Mapper proxy can be deployed in both transparent and explicit modes. Intercepting RPC traffic is part of the complete solution that includes the MAPI proxy ("Section B: The MAPI Proxy" on page 62).

Note: Only Microsoft RPC version 5.0 is supported. Unsupported Microsoft RPC version traffic is passed through the SG appliance without processing.

Section A: The Endpoint Mapper Proxy Service***Policy Support***

The Endpoint Mapper proxy supports any policy that applies to TCP tunnel connections. See “Reference: CPL Triggers, Properties, and Actions” on page 60 for supported CPL triggers and actions.

Access Logging

Each TCP connection results in an access log entry. Both the Endpoint Mapper proxy and secondary tunnel traffic activities are logged. The SG appliance main access log format is used by default.

Note: If the access log for the primary connection changes to a new log, the secondary connections are also moved to the new log.

For a reference list and descriptions of used log fields, see “Reference: Access Log Fields” on page 59.

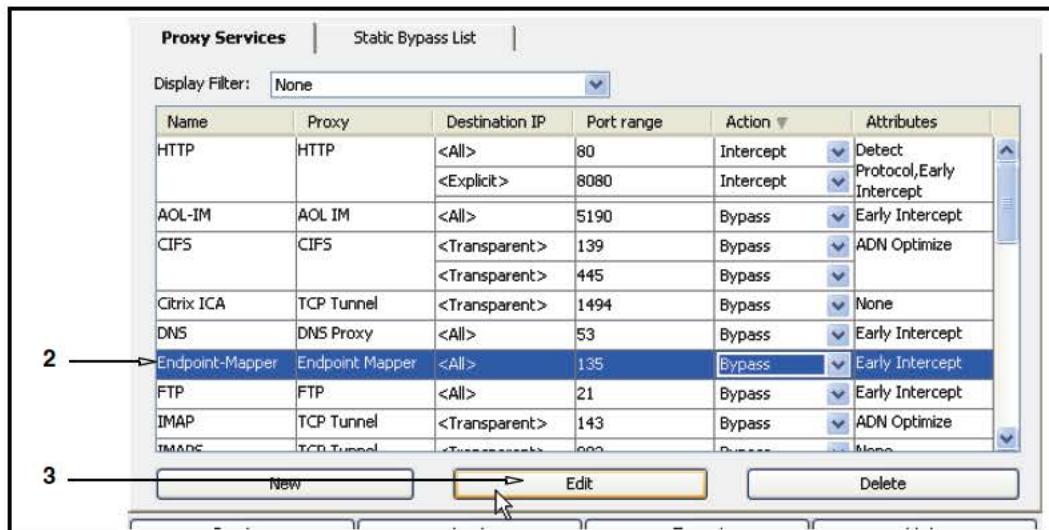
Configuring the SG Appliance Endpoint Mapper Service

By default (upon upgrade and on new systems), the SG appliance has an Endpoint Mapper service configured on port 135. The service is also configured to listen to all IP addresses, but is set in **Bypass** mode.

The following procedure describes how to change the service to **Intercept** mode, and explains other attributes within the service.

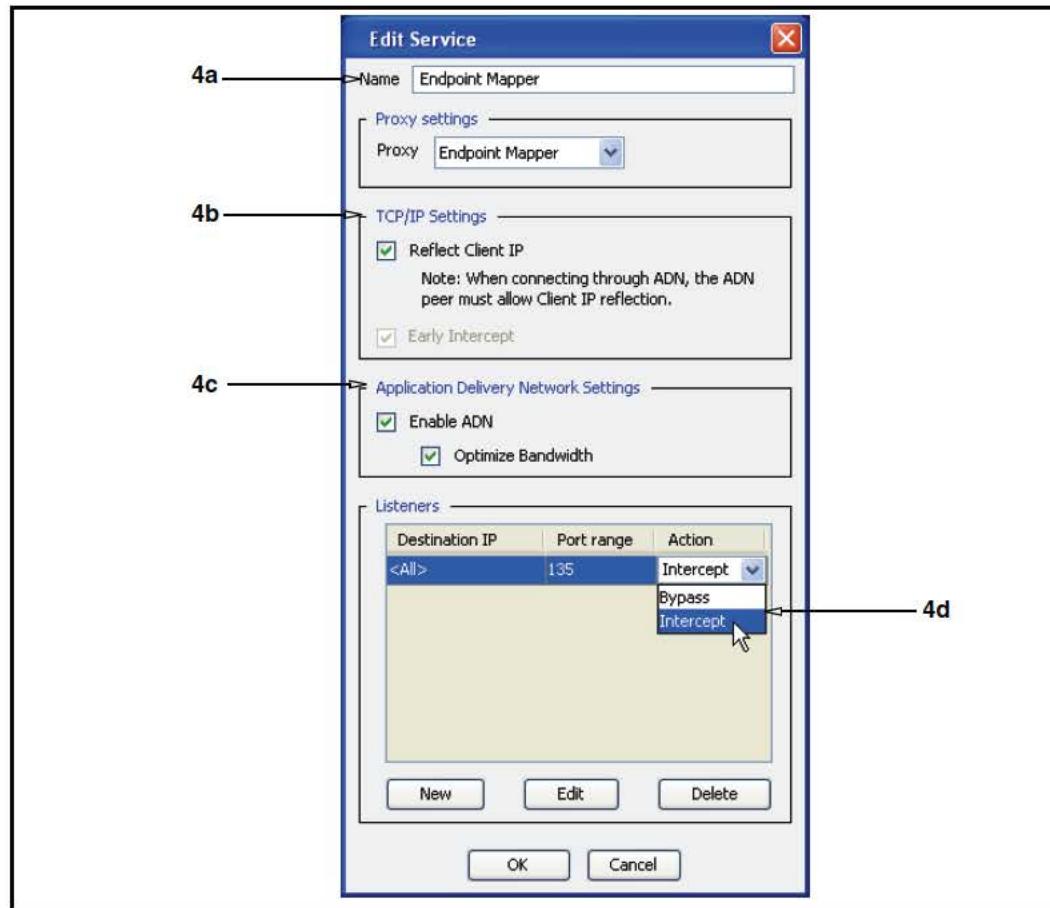
To configure the Endpoint Mapper service attributes:

- From the Management Console, select Configuration > Services > Proxy Services.



- Scroll the list of services to display the default Endpoint Mapper service line. Notice the **Action** is **Bypass**. You can select **Intercept** from the drop-down list, but for the purposes of this procedures, select the service line to highlight it.
- Click **Edit**. The Edit Service dialog appears, with some default settings, is displayed.

Section A: The Endpoint Mapper Proxy Service



4. Configure the service attributes:
 - a. (Optional) The default service name is **Endpoint Mapper**, which identifies the service type.
 - b. The **TCP/IP Settings** options allow you to manage the data connections:
 - **Reflect Client IP**: If this is enabled, the connection to the RPC server appears to come from the client, not the SG appliance.
 - **Early Intercept**: Not available for this feature.
 - c. Enabling the **ADN Optimize** option is recommended by Blue Coat. This feature improves performances by compressing request and response data, which still needs to be forwarded across the WAN. For more information about ADN optimization, refer to *Volume 6: Advanced Networking*.
 - d. In the **Listeners** field, select **Intercept** from the drop-down list; the SG must intercept the RPC connection.

Note: You can also change the mode from **Bypass** to **Intercept** from the main services page.

 - e. Click **OK**.
5. Click **Apply**.

Section A: The Endpoint Mapper Proxy Service

Result: The Endpoint Mapper service is configured and appears in Management Console. RPC traffic is intercepted.

Reviewing Endpoint Mapper Proxy Statistics

After RPC traffic begins to flow through the SG appliance, you can review the statistics page and monitor results in various categories. The presented statistics are representative of the client perspective.

Statistic URL Pages

Endpoint Mapper proxy statistics pages are viewable from Management Console URLs.

Statistics

This page displays various, more granular connection and byte statistics.

`https://SG_IP_address:8082/epmapper/statistics`

Detailed Statistics

This page displays specific client-to-server connection and file information and statistics.

`https://SG_IP_address:8082/epmapper/detailed-statistics`

Reference: Equivalent Endpoint Mapper Proxy CLI Commands

The Management Console procedures in this section have the following equivalent CLI command roots:

- To enter configuration mode for the service:

```
SGOS#(config) proxy-services  
SGOS#(config proxy-services) create endpoint-mapper service-name  
SGOS#(config proxy-services) edit service-name
```

- The following subcommands are available:

```
SGOS#(config service-name) add {all | ip_address | ip_address/subnet-  
mask} {port | first_port-last_port} [intercept | bypass]  
SGOS#(config service-name) attribute {adn-optimize {enable | disable}|  
reflect-client-ip {enable | disable}}  
SGOS#(config service-name) bypass {all | ip_address | ip_address/  
subnet-mask} {port | first_port-last_port}  
SGOS#(config service-name) exit  
SGOS#(config service-name) intercept {all | ip_address | ip_address/  
subnet-mask} {port | first_port-last_port}  
SGOS#(config service-name) remove {all | ip_address | ip_address/  
subnet-mask} {port | first_port-last_port}  
SGOS#(config service-name) view
```

Reference: Access Log Fields

The default SG appliance Endpoint Mapper Access Log fields are:

- date: GMT Date in YYYY-MM-DD format.
- time: GMT time in HH:MM:SS format.

Section A: The Endpoint Mapper Proxy Service

- ❑ cs-bytes, sr-bytes, rs-bytes, sc-bytes: Standard ELFF format. The total RPC byte counts in the specified direction (client-server).
- ❑ cs-method: Request method used from client to appliance.
- ❑ time-taken: Time taken (in milliseconds) to process the request.
- ❑ c-ip: IP address of the RPC client.
- ❑ s-action: The logging action (or flow) being one of the following:
 - ALLOWED: Endpoint operation passed the policy checkpoint and was also successful.
 - DENIED: Endpoint operation failed the policy checkpoint.
 - FAILED: Endpoint operation was successful on the server but failed on the proxy for some internal reason.
 - TUNNELED: Traffic was tunneled.
- ❑ cs-uri-scheme: Scheme from the log URL.
- ❑ cs-host: Hostname from the client's request URL. If URL rewrite policies are used, this field's value is derived from the log URL.
- ❑ cs-port: Port used from the client to the appliance.
- ❑ cs-username: Relative username of a client authenticated to the proxy (for example: not fully distinguished).
- ❑ s-supplier-ip: IP address of the upstream host (not available for a cache hit).
- ❑ s-supplier-name: Hostname of the upstream host (not available for a cache hit).
- ❑ s-supplier_port: Port number of the upstream host (not available for a cache hit).
- ❑ r-supplier-ip: IP address used to contact the upstream host (not available for a cache hit).
- ❑ r-supplier-name: Hostname used to contact the upstream host (not available for a cache hit).
- ❑ r-supplier_port: Port used to contact the upstream host (not available for a cache hit).
- ❑ sc-filter-result: Content filtering result: Denied, Proxied, or Observed.
- ❑ sc-filter-category: Content filtering category.
- ❑ s-ip: IP address of the appliance on which the client established its connection.
- ❑ s-sitename: Service used to process the transaction.

Reference: CPL Triggers, Properties, and Actions

The following SG appliance CPL is supported in the Endpoint Mapper proxy service:

- ❑ allow/deny

TCP Tunneling Triggers

- ❑ Client: `client.address, client.host, client.host.has_name, client.protocol` (recognizes `epmapper` token).

Section A: The Endpoint Mapper Proxy Service

- Date/Time: date[.utc], day, hour, minute, month, weekday, year, time
- Proxy: proxy.address, proxy.port, proxy.card
- has_client
- url

Properties and Actions

- allow/deny
- trace
- log_message
- notify_email, notify_snmp
- reflect_ip
- access_log
- forward
- socks_gateway

Section B: The MAPI Proxy

Section B: The MAPI Proxy

This section discusses the Messaging Application Programming Interface (MAPI) protocol and describes how to configure the services and proxy on the SG appliance.

About MAPI

MAPI is the protocol used by Microsoft Outlook (client) to communicate with Microsoft Exchange (server), most commonly for e-mail applications. MAPI itself is based on the Microsoft Remote Procedure Call (RPC).

Because MAPI is based on RPC, it suffers from the same performance inherent with RPC communications. Microsoft Outlook is the most common enterprise e-mail application. As enterprises continue to trend toward consolidating servers, which requires more WAN deployments (branch and remote locations), e-mail application users experience debilitating response times for not only sending and receiving mail, but accessing message folders or changing calendar elements. This is because MAPI RPC transmissions are broken into *blocks* of data (no more than 32 KB). The client must stop and wait for each block to arrive before requesting the next block. Each stop represents time lost instead of data sent.

About the Blue Coat MAPI Solution

The MAPI proxy is similar to and actually works in conjunction with the Endpoint Mapper proxy in that it intercepts and accelerates RPCs; however, MAPI is always deployed transparently and does *not* listen on a specific port or port range. Instead, when configured to do so, the Endpoint Mapper proxy *hands off* Outlook/Exchange traffic to the MAPI proxy (but the Endpoint Mapper proxy functionality is still required to make an RPC connection).

The MAPI proxy itself is a *split proxy*, which is only viable in a deployment that consists of a branch proxy and core proxy. A split proxy employs co-operative processing at the branch and the core to implement functionality that is not possible in a standalone proxy. In the case of the MAPI Proxy, cooperation exists between the branch SG appliance and the core SG appliance to reduce the number of RPCs sent across the WAN.

The TCP connection between the branch and core proxies makes use of byte caching for acceleration (compression).

Section B: The MAPI Proxy

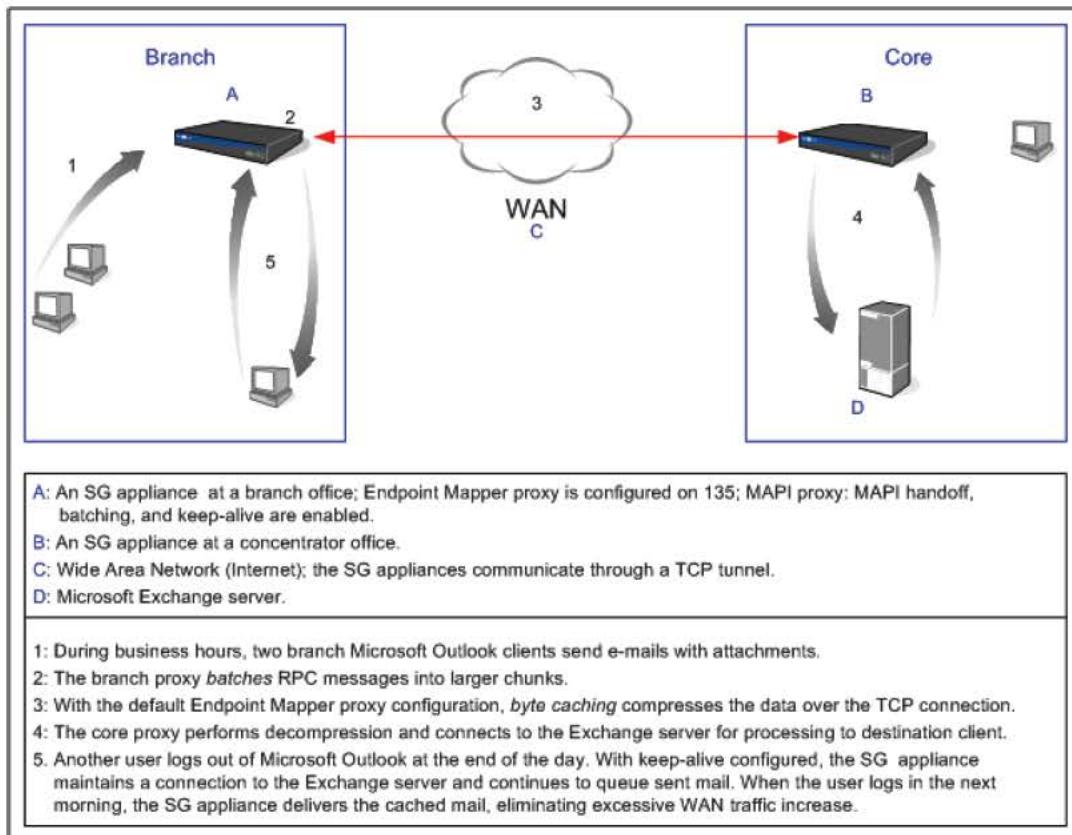


Figure 6-1. MAPI Proxy Deployment and Flow Diagram

Batching

The MAPI proxy Batching feature reduces the number of RPC messages traversing the WAN. The branch and core appliances work together to batch multiple RPC messages in a larger chunk, rather than sending the smaller chunks. Also, the proxy *predicts*, or reads ahead, what will be requested next. When the branch proxy receives data chunks, it begins sending the acknowledgments to the MAPI client to satisfy that requirement of the communication process.

Keep-Alive

The MAPI proxy Keep-Alive feature allows the SG appliance to maintain the connection to the Exchange server *after* the user has logged off from Outlook. Determined by the configurable interval, the MAPI proxy checks the Exchange server for new mail. *ADN Optimization* allows the connection to remain *warm* so that when the user logs on again to Outlook, the number of retrieved bytes is lower, allowing for better performance.

The MAPI proxy remembers *each* user that is logged on or off. If the duration exceeds the specified limit, or when the user logs back into the mail application, the Keep-Alive connection is dropped.

For more information about ADN optimization, refer to *Volume 6: Advanced Networking*.

Section B: The MAPI Proxy

Supported Servers

The MAPI proxy supports:

- MAPI 2000 (Outlook/Exchange 2000).
- MAPI 2003—Tunneled over TCP. The Batching and Keep-Alive features are not available.

Access Logging

The MAPI proxy uses a default access log format. Data includes user actions, data lengths (bytes), and RPC data.

```
date, time, c-ip, c-port, r-ip, r-port, x-mapi-user, x-mapi-method,  
cs-bytes, sr-bytes, rs-bytes, sc-bytes, x-mapi-sc-rpc-count, x-mapi-  
sr-rpc-count, x-mapi-rs-rpc-count, x-mapi-sc-rpc-count, s-action, cs-  
username, cs-auth-group, s-ip
```

For MAPI-specific descriptions, see “[Reference: Access Log Fields](#)” .

More Conceptual Reference

- “[About RPC](#)” on page 56.
- [Volume 6: Advanced Networking](#).

Configuring the SG MAPI Proxy

This section contains the following sub-sections:

- “[Configuring the SG Appliance Endpoint Mapper Service](#)” on page 57.
- “[Reviewing Endpoint Mapper Proxy Statistics](#)” on page 59.

About the MAPI Service

By default (upon upgrade and on new systems), the SG appliance has an Endpoint Mapper proxy service configured on port 135. The service is also configured to listen to all IP addresses, but is set in **Bypass** mode. As the MAPI proxy processes RPC communication as well, it uses the Endpoint Mapper proxy service. See “[Section A: The Endpoint Mapper Proxy Service](#)” on page 56.

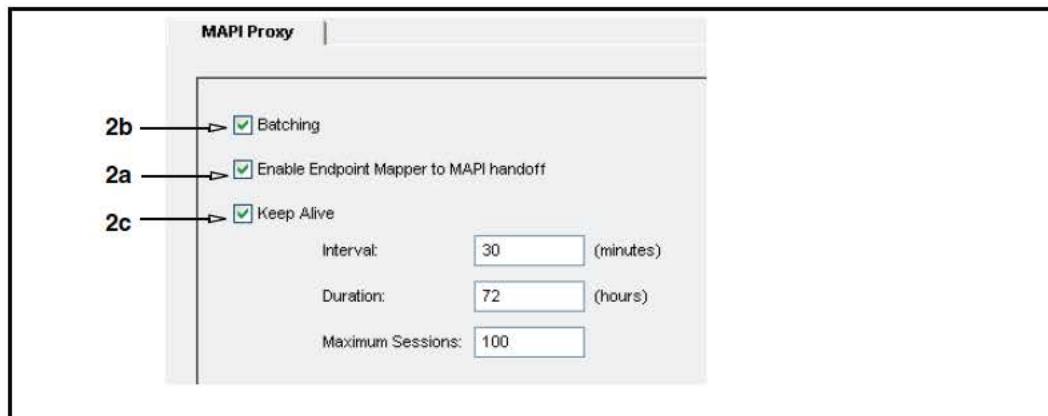
Configuring the MAPI Proxy

The MAPI Proxy options concern Batching, Handoff, and Keep-Alive features. This section describes these options and why they might require changing based on your branch deployment.

To view/change the MAPI Proxy configuration options:

1. In the Management Console, select **Configuration > Proxy Settings > MAPI Proxy**.

Section B: The MAPI Proxy



2. Configure the MAPI Proxy configuration options:

- a. **Enable Endpoint Mapper to MAPI Handoff:** The Endpoint Mapper proxy sends Microsoft Outlook and Exchange RPC communications to the MAPI proxy, which is used to manage the data. The routing connections from the branch to the core remains under the control of the Endpoint Mapper service.

Note: A secondary TCP connection is created to handle all non-MAPI traffic. No changes to the Endpoint Mapper service or proxy are required.

- b. **Batching:** If enabled, MAPI traffic across the WAN is accelerated because data is chunked and sent as one connection, rather than multiple smaller connections.
- c. **Keep-Alive:** After a user logs out of Outlook, the MAPI RPC connection remains and the SG appliance continues to receive incoming messages to this account. If disabled (the default), no attempts to contact the server occur until the next time the user logs into his/her Outlook account. This might create a noticeable decrease in performance, as the queue of unreceived mail is processed.
 - **Interval:** If **Keep-Alive** is enabled, how often the MAPI proxy contacts the Exchange server to check for new messages.
 - **Duration:** If **Keep-Alive** is enabled, how long the MAPI proxy maintains the connection to the Exchange server. The connection is dropped if the duration exceeds this value or once a user logs back in to the mail application.
 - **Maximum Sessions:** Limits the number of occurring active keep-alive sessions. If a new keep-alive session starts, and the specified limit is already exceeded, the oldest keep-alive session is dropped.

3. Click OK; click **Apply**

Reviewing MAPI Statistics

After MAPI traffic begins to flow through the SG appliance, you can review the statistics page and monitor results in various MAPI categories. The presented statistics are representative of the client perspective.

Section B: The MAPI Proxy

To review MAPI statistics:

1. From the Management Console, select **Statistics > MAPI History**.
2. View statistics:
 - a. Select a statistic category tab:
 - **MAPI Clients Bytes Read:** The total number of bytes read by MAPI clients.
 - **MAPI Clients Bytes Written:** The total number of bytes written by MAPI clients.
 - **MAPI Clients:** The total number of connected MAPI clients.
 - b. The graphs display three time metrics: the previous 60 minutes, the previous 24 hours, and the previous 60 days. Roll the mouse over any colored bar to view the exact metric.
3. (Optional) You can change the scale of the graph to display the percentage of bar peaks to display.

Reference: Equivalent MAPI Proxy CLI Commands

The Management Console procedures in this chapter have the following equivalent CLI command roots:

```
SGOS#(config) mapi
```

- The following subcommands are available:

```
SGOS#(config mapi) handoff {enable | disable}
SGOS#(config mapi) batching {enable | disable}
SGOS#(config mapi) keep-alive {enable | disable}
SGOS#(config mapi) keep-alive interval [minutes 1-60]
SGOS#(config mapi) keep-alive duration [hours 1-72]
SGOS#(config mapi) {view | exit}
```

Reference: Access Log Fields

The default MAPI Access Log fields are:

```
"date time c-ip c-port r-ip r-port x-mapi-user \" \
"x-mapi-method cs-bytes sr-bytes rs-bytes sc-bytes \" \
"x-mapi-cs-rpc-count x-mapi-sr-rpc-count \" \
"x-mapi-rs-rpc-count x-mapi-sc-rpc-count \" \
"s-action cs-username cs-auth-group s-ip"
```

- **cs-bytes, sr-bytes, rs-bytes, sc-bytes:** Standard ELFF format. The total RPC byte counts in the specified direction (client-server).
- **x-mapi-method:** The end-user operation, one of:
 - **STARTUP:** The start of a MAPI session. A single user can have more than one active MAPI sessions for a single instance of Outlook.
 - **SHUTDOWN:** The end of a MAPI session.
 - **SEND:** Outlook is sending an e-mail (with or without attachments) to Exchange and the SG appliance is batching the contents.
 - **FETCH:** Outlook is fetching an e-mail (with or without attachments) to Exchange and the SG appliance is batching the contents.

Section B: The MAPI Proxy

- KEEP_ALIVE_STARTUP: A keep-alive session started.
 - KEEP_ALIVE_SHUTDOWN: A keep-alive session ended.
 - KEEP_ALIVE_NEGOTIATE: Messages were sent to query the state of the Inbox during a keep-alive session.
 - KEEP_ALIVE_FETCH: An e-mail (with or without attachments) was fetched during a keep-alive session.
- x-mapi-user-dn: The full user domain name gathered from the MAPI negotiation of user credentials between Outlook and Exchange.
 - x-mapi-user: A shortened form of the user domain name.
 - s-action:
 - ALLOWED: The traffic was permitted through.
 - SUCCESS: The traffic was successfully proxied, but was not subject to policy.
 - DENIED: The traffic was denied by policy.
 - SERVER_ERROR: The traffic was dropped because of an error communicating with the server.
 - FAILED: The traffic was dropped because of an error when handling the messages sent by the client. Or an internal problem with the MAPI proxy.
 - BATCHED: The traffic was batched.
 - TUNNELED: The traffic was tunneled to the Exchange server for one of two reasons:
 - The MAPI traffic is encrypted; therefore, the SG appliance cannot batch messages or attachments and thus cannot provide WAN optimization benefits.
 - The MAPI proxy could not connect upstream through an Application Delivery Network (ADN) tunnel.
- x-cs-mapi-rpc-count: The number of RPCs sent from the client to the proxy.
 - x-sr-mapi-rpc-count: The number of RPCs sent from the proxy to the server.
 - x-rs-mapi-rpc-count: The number of RPCs sent from the server to the proxy.
 - x-sc-mapi-rpc-count: The number of RPCs sent from the proxy to the client.

Chapter 7: Managing the FTP Proxy

Blue Coat supports accessing FTP origin content servers over HTTP (*Web FTP*) as well as supporting native FTP proxy.

Web FTP is used when a client connects in explicit mode using HTTP and accesses an `ftp://` URL. The SG appliance translates the HTTP request into an FTP request for the origin content server (OCS) (if the content is not already cached), and then translates the FTP response with the file contents into an HTTP response for the client.

Native FTP involves the client connecting (either explicitly or transparently) using FTP; the SG appliance then connects upstream through FTP (if necessary).

Understanding FTP

With Blue Coat's implementation of FTP, you can control how the SG appliance responds to FTP client requests. You can also control which IP addresses are used.

This section discusses:

- ❑ “[Passive Mode Data Connections](#)” on page 69
- ❑ “[Understanding IP Reflection for FTP](#)” on page 70

Passive Mode Data Connections

Data connections initiated by an FTP server to an FTP client at the port and IP address requested by the FTP client are known as *PORT* or active connections. This connection method is used when the FTP server can connect directly to the FTP client.

Data connections initiated by an FTP client to an FTP server at the port and IP address requested by the FTP server are known as *passive mode data connections*. This type of connection is useful in situations where an FTP server is unable to make a connection to an FTP client because the client is located behind a firewall or other similar device where outbound connections from the client are allowed, but inbound connections to the client are blocked.

Using passive mode data connections (which can set through the Management Console or the CLI) allows administrators to select how the SG appliance responds to a request from an FTP client for a passive mode data connection (PASV command).

Some FTP clients do not open a passive mode data connection to an IP address that is different from the IP address used for the control connection.

Disabling PASV on the SG appliance servicing requests from this type of FTP client might provide a more acceptable response to the end user.

When PASV is disabled, some FTP clients try a PORT command automatically, which allows requests to be received when the client doesn't allow PASV connections to a different IP address.

Note: some clients might display an error when PASV is disabled on the SG appliance, requiring you to manually request PORT mode.

The FTP client software controls any messages displayed to the end user as a result of this response from the SG appliance.

Understanding IP Reflection for FTP

IP reflection determines how the client IP address is presented to the origin server for all requests. The FTP service uses a Reflect Client IP attribute that enables or disables sending of client's IP address instead of sending the SG appliance's IP address by default when connecting to the OCS.

IP reflection in policy and the corresponding attribute in services can be used for FTP control connections to the OCS; certain deployments are subject to limitations. The client and server-side policies are:

- `ftp.match_client_data_ip(yes)`—The SG appliance always reflects the IP address that the client originally attempts to connect to on the client-side control connection. The `ftp.match_client_data_ip(yes)` property allows you to also use that same client IP address when making an active data connection back to the client. This is independent of whether `reflect_ip()` or `ftp.match_server_data_ip()` is in use on the server side.
- `reflect_ip()`—Controls whether to do IP reflection for server-side control connections. This can also be enabled using the Reflect Client IP attribute.
- `ftp.match_server_data_ip(yes)`—Matches the source IP address of the PASV data connection with the source IP address of the SG appliance control connection (server side). Note that the `reflect_ip()` policy must be set for `ftp.match_server_data_ip(yes)` to be meaningful.

The following points describe the various data flow scenarios:

- Outbound client data connection (SG appliance to client)—When the client issues a PORT command, the appliance opens a data connection to the FTP client with the source IP address of whatever destination IP address the client used when opening the control connection.
- Inbound client data connection (client to SG appliance)—When the client issues a PASV command, the appliance returns the IP address and port to which client makes a data connection.
 - Explicit—The SG appliance returns the destination IP address of the control connection; this can be a physical or virtual IP address.
 - Transparent—The SG appliance returns the IP address of the physical adapter on which the control connection arrived.

Note: For information on using transparent or explicit proxies, see [Appendix B: "Explicit and Transparent Proxy" on page 175](#).

- Outbound server data connection (SG appliance to FTP server)—When the SG appliance issues a PASV command upstream, the server returns an IP address and port to connect to. The appliance then opens a data connection to the server with the same source IP address it used to open the control connection. This address is defined by the `reflect_ip` property.
- Inbound server data connection (FTP server to SG appliance)—When the SG appliance issues a PORT command, the appliance provides the IP address and port number to which the server makes a data connection.

- The SG appliance sends the control connection's source IP address if that IP is a local appliance (virtual or physical) IP address; or
- The SG appliance sends the IP address of the physical adapter that was used to make the outgoing control connection.

FTP Server Notes

- IIS and WS_FTP servers do not support PASV data connections with a source IP address that is different from the source IP address of the control connection.
- IIS and WS_FTP servers do not support ACTIVE data connections with a destination IP address that differs from the source IP address of the control connection.

Notes

- Internet Explorer does not support proxy authentication for native FTP.
- The SG appliance FTP proxy does not support customized exception text; that is, you can use policy to deny requests, but you can't control the text sent in the error message.

Configuring the SG Appliance for Native FTP Proxy

This section discusses:

- “Creating or Editing the FTP Service”
- “Configuring the FTP Proxy” on page 73
- “Configuring FTP Clients” on page 74

Creating or Editing the FTP Service

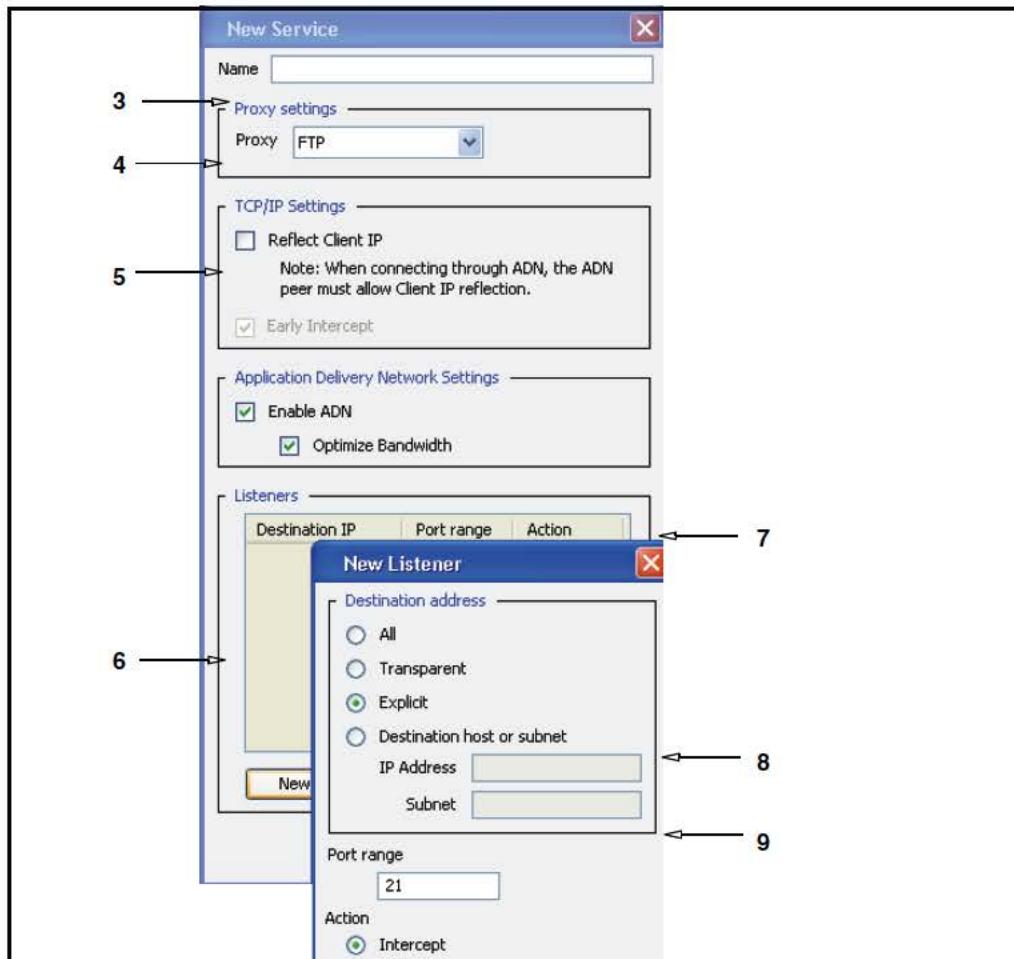
An FTP service is created by default, but it is in bypass mode. The service is not functioning until it is in intercept mode.

Note: Web FTP requires an HTTP service, not an FTP service. For information on configuring an HTTP proxy service, see “[Chapter 8: Managing the HTTP Proxy](#)” on page [77](#).

To create or edit an FTP proxy service:

1. From the Management Console, select **Configuration > Services > Proxy Services**.
2. To edit an existing FTP proxy service, highlight the service and click **Edit**. To create a new proxy service, click **New**.

Note: If you only want to change the proxy's behavior from bypass (the default) to intercept, go to the **Action** column of the **Proxy Services** pane, select the service whose behavior you want to change, and select **Intercept** from the drop-down list. You do not need to enter **New/Edit** mode to change this attribute.



3. If you are creating a new FTP proxy service, enter a meaningful name in the **Name** field.
4. Select FTP from the drop-down list under **Proxy settings**.
5. Select or de-select the checkboxes, as appropriate, for the service being set up.
 - a. The **Early Intercept** checkbox cannot be changed for the FTP proxy service.
 - b. The **Reflect Client IP** checkbox enables or disables sending of client's IP address instead of the SG appliance's IP address when connecting to the origin content server. Note that this setting can be overruled by policy.
 - c. The **Enable ADN** controls whether ADN is enabled for a specific service. Enabling ADN does not guarantee the connections are accelerated by ADN. The actual enable decision is determined by ADN routing (for explicit deployment) and network setup (for transparent deployment).

Note: ADN supports passive FTP (the data connection is initiated by an FTP client to an FTP server at the port and IP address requested by the FTP server). Active FTP, where data connections are initiated by an FTP server to an FTP client at the port and IP address requested by the FTP client, is not supported.

- d. The **Optimize Bandwidth** checkbox is selected by default if you enabled ADN optimization during initial configuration. De-select the checkbox if you are not configuring ADN optimization.
- 6. To create a new listener, click **New**; if you edit an existing listener, click **Edit**.
- 7. Select a Destination IP address from the drop-down menu.
- 8. In the **Port Range** field, enter the ports on which the service should listen. The default port for FTP is 21.
- 9. Select the default behavior for the service: **Bypass** tells the service to ignore any traffic. **Intercept** configures the service to intercept the traffic that is being proxied.
- 10. Click **OK**; click **Apply**.

Related CLI Syntax to Create/Edit an FTP Proxy Service

- To enter configuration mode for the service:

```
SGOS#(config) proxy-services
SGOS#(config proxy-services) create ftp service-name
SGOS#(config proxy-services) edit service-name
```

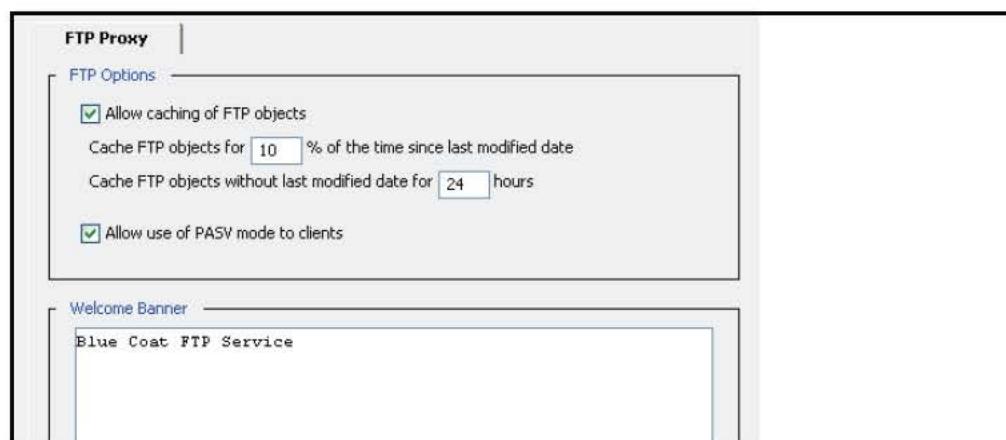
- The following subcommands are available:

```
SGOS#(config service-name) add {all | ip_address | ip_address/subnet-
mask} {port | first-port_last-port} [intercept | bypass]
SGOS#(config service-name) attribute adn-optimize {enable | disable} |
reflect-client-ip {enable | disable} | use-adn {enable | disable}
SGOS#(config service-name) bypass {all | ip_address | ip_address/
subnet-mask} {port | first-port_last-port}
SGOS#(config service-name) exit
SGOS#(config service-name) intercept {all | ip_address | ip_address/
subnet-mask} {port | first-port_last-port}
SGOS#(config service-name) remove {all | ip_address | ip_address/
subnet-mask} {port | first-port_last-port}
SGOS#(config service-name) view
```

Configuring the FTP Proxy

To configure the FTP proxy:

1. Select Configuration > Proxy Settings > FTP Proxy.



2. Select **Allow caching of FTP objects**. The default is enabled.
3. Determine the amount of time in percentage of how long since the object was last modified. The default is 10%.
4. Enter an amount, in hours, that the object remains in the cache before becoming eligible for deletion. The default is 24 hours.
5. Select **Allow use of PASV mode to clients**. The default is enabled, allowing data connections to be initiated by an FTP client to an FTP server at the port and IP address requested by the FTP server.

Related CLI Syntax to Configure the FTP Proxy

```
SGOS#(config) ftp login-syntax {raptor | checkpoint}
SGOS#(config) ftp passive-mode {enable | disable}
SGOS#(config) ftp no welcome-banner
SGOS#(config) ftp welcome banner
SGOS#(config) caching
SGOS#(config caching) max-cache-size number8
SGOS#(config caching) ftp
SGOS#(config caching ftp) enable
SGOS#(config caching ftp) type-m-percent number
SGOS#(config caching ftp) type-n-initial number
```

Note: Neither proxy authentication for transparent FTP nor proxy chaining are supported with the Checkpoint syntax.

Configuring FTP Clients

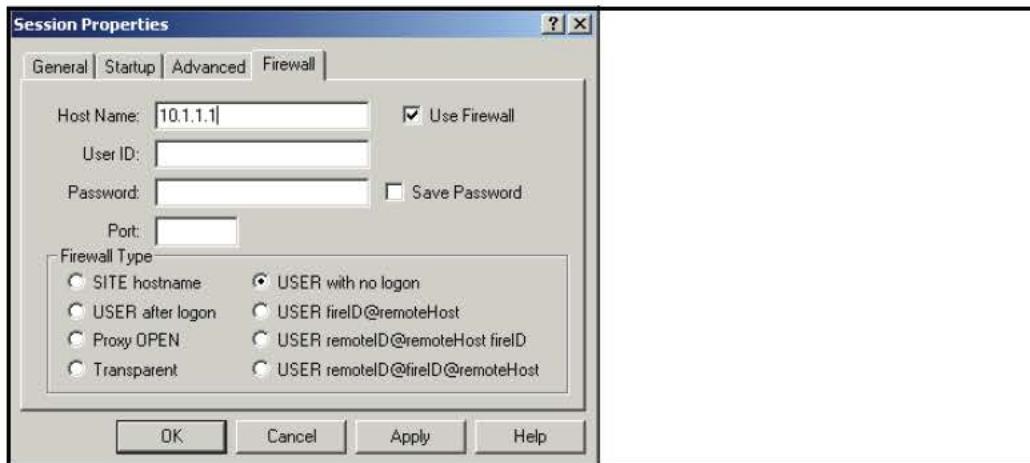
if you want to configure an FTP client to explicitly proxy to the SG appliance, complete the following steps.

Note: The steps below are for a WSFtp client. Other clients vary.

- Enable firewall.
- Select **USER with no logon** unless you are doing proxy authentication. In that case, select **USER remoteID@remoteHost fireID** and specify a proxy username and password.

Example

The illustration demonstrates a WSFtp client configuration.



Configuring FTP Connection Welcome Banners

You can customize banners that usually describe the policies and content of the FTP server displayed to FTP clients. Without modification, the SG appliance sends a default banner to newly-connected FTP clients: **Welcome to Blue Coat FTP**. However, you might not want users to know that a SG appliance exists on the network. A default banner can be defined in the Management Console or the CLI, but other banners defined for specific groups can be created in policy layers.

Note: Configurable banners are only displayable when FTP is explicitly proxied through the SG appliance. In transparent deployments, the banner is sent to the client when proxy authentication is required; otherwise, the banner is forwarded from the FTP server.

To define the default FTP banner:

1. Select Configuration > Services > FTP Proxy.
2. In the **Welcome Banner** field, enter a line of text that is displayed on FTP clients upon connection. If the message length spans multiple lines, the SG appliance automatically formats the string for multiline capability.



Note that the welcome banner text is overridden by the policy property `ftp.welcome_banner()`. This is required for explicit proxy requests, when doing proxy authentication, and also when the policy property `ftp.server_connection(deferred|immediate)` is set to defer the connection.

3. Click **Apply**.

Related CLI Syntax to Define the Default FTP Banner

```
#SGOS#(config) ftp welcome-banner "message"
```

Related CPL Syntax to Create Policy that Overrides the Default Banner

```
<Proxy>
  ftp.welcome_banner( "message")
```

If entering text that spans more than one line, use \$(crlf) for line breaks.

Viewing FTP Statistics

See [Chapter 8: "Managing the HTTP Proxy" on page 77](#) for information about viewing the FTP statistics.

Chapter 8: Managing the HTTP Proxy

By default, an HTTP proxy service, with both explicit and transparent attributes set, is enabled on port 80. To change the attributes of the proxy service or create new HTTP proxy services, see “[Creating or Editing a Proxy Service](#)” on page 28.

The HTTP proxy is the first line of defense for the SG appliance, controlling all traffic that arrives on port 80 . To control that traffic and improve performance, you can:

- Set default caching policies to configure the length of time an object or negative response is cached, whether objects are always revalidated before being served, whether server certificates are verified by default, and how headers are parsed. For more information, see “[Understanding Tolerant HTTP Request Parsing](#)” on page 96.
- Configure the HTTP proxy as a server accelerator. For more information, see “[Customizing the HTTP Proxy Profile](#)” on page 88.
- Set a limit to the maximum bandwidth the SG appliance is allowed to use for refreshing objects in the background. For more information, see “[Setting Default HTTP Proxy Policy](#)” on page 86.
- Compress and decompress content. For more information, see “[Understanding HTTP Compression](#)” on page 97.

Note: Use of the compression feature is a trade-off among three resources: server-side bandwidth, client side-bandwidth, and CPU. If server-side bandwidth is expensive compared to CPU, always request compressed content from the origin content server (OCS). If CPU is comparatively expensive, then the SG appliance should ask the server for the compression formats that the client asked for and forward whatever the server returns.

The HTTP proxy is designed to control Web traffic, providing:

- Security
- Authentication
- Virus Scanning and Patience Pages
- Performance
 - Default HTTP Proxy Policy
 - HTTP Proxy Caching Profiles
 - Byte-Range Support
 - Refresh Bandwidth
 - Compression

This chapter discusses:

- “Creating an HTTP Proxy Service” on page 79
- “Overview: Configuring HTTP Proxy Performance” on page 83
- “Configuring the HTTP Proxy” on page 86
- “Viewing HTTP/FTP Statistics” on page 105
- “Using Explicit HTTP Proxy with Internet Explorer” on page 109

[Section A: Creating an HTTP Proxy Service](#)

Section A: Creating an HTTP Proxy Service

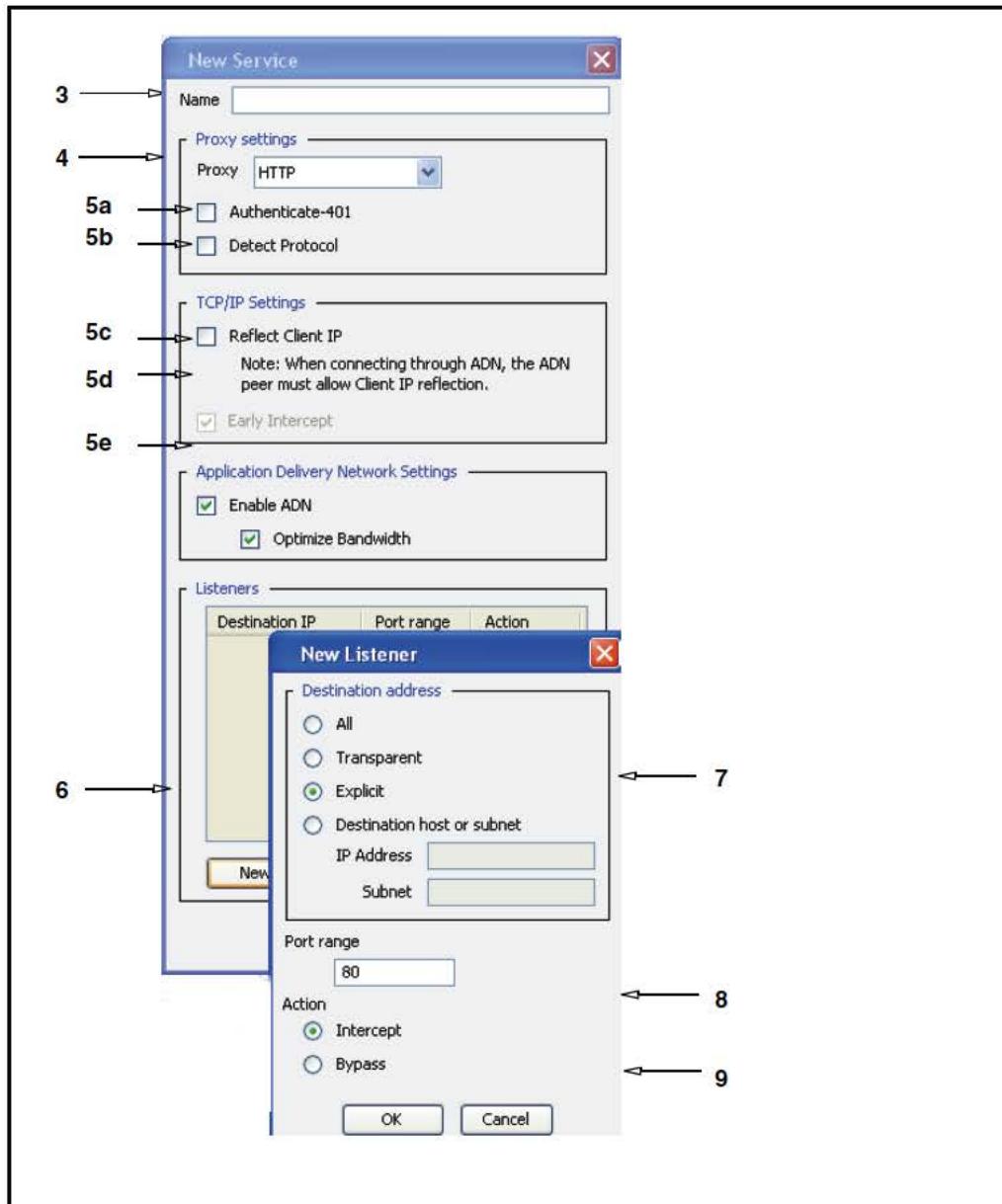
Two HTTP services exist by default and are enabled, one with explicit and transparent attributes on port 80 and one with explicit attributes on port 8080. You can change the attributes or create other HTTP ports if needed. For example, if you configure SSL proxy functionality, you must create a separate HTTP service to allow the browser to issue HTTP CONNECT requests to the SG appliance for HTTPS content. The SG appliance detects the presence of the SSL protocol and enables SSL Proxy functionality for such connections. For more information on SSL proxy functionality, see “[Managing the SSL Proxy](#)” on page [137](#).

To create or edit an HTTP proxy service:

1. From the Management Console, select **Configuration > Services > Proxy Services**.
2. To edit an existing HTTP proxy service, highlight the service and click **Edit**. To create a new proxy service, click **New**.

Note: If you only want to change the proxy’s behavior from bypass (the default) to intercept, go to the **Action** column of the **Proxy Services** pane, select the service whose behavior you want to change, and select **Intercept** from the drop-down list. You do not need to enter **New/Edit** mode to change this attribute.

Section A: Creating an HTTP Proxy Service



3. If you are creating a new HTTP proxy service, enter a meaningful name in the **Name** field.
4. Make sure HTTP is selected in the drop-down box under **Proxy settings**.
5. Select or de-select the checkboxes, as appropriate, for the service being set up. The **Early Intercept** checkbox cannot be selected.

Section A: Creating an HTTP Proxy Service

- a. Select the **Authenticate 401** checkbox if you want all transparent and explicit requests received on the port to always use transparent authentication (cookie or IP, depending on the configuration). This is especially useful to force transparent proxy authentication in some proxy-chaining scenarios.
 - b. Select the **Detect Protocol** checkbox to automatically detect the protocol being used. Note that this breaks connections that do not have the client send information first, but expect the server to respond on connection. It also can add significant delay if the client does not send specific information, and only after timing out does it treat the traffic as unknown.
 - c. **Reflect Client IP:** Enables or disables sending of client's IP address instead of the SG appliance's IP address.
 - d. **Early intercept:** This option cannot be changed when creating or editing an HTTP proxy service.
 - e. **Enable ADN:** Controls whether ADN is enabled for a specific service. Enabling ADN does not guarantee the connections are accelerated by ADN. The actual enable decision is determined by ADN routing (for explicit deployment) and network setup (for transparent deployment)
 - f. The **Optimize Bandwidth** checkbox is selected by default if you enabled ADN optimization during initial configuration. You should de-select the checkbox if you are not configuring ADN optimization.
6. To create a new listener, click **New**; if you edit an existing listener, click **Edit**.
 7. Select a Destination IP address from the drop-down menu.
 8. In the **Port Range** field, enter the ports on which the service should listen. The default ports for HTTP are 80 and 8080.
 9. Select the default behavior for the service: **Bypass** tells the service to ignore any traffic. **Intercept** configures the service to intercept the traffic that is being proxied.
 10. Click **OK**.

Relevant CLI Syntax to Create/Edit an HTTP Proxy Service:

- To enter configuration mode for the service:


```
SGOS#(config) proxy-services
SGOS#(config proxy-services) create http service-name
SGOS#(config proxy-services) edit service-name
```
- The following subcommands are available:


```
SGOS#(config service-name) add {transparent | explicit | all |
ip_address | ip_address/subnet-mask} {port | first_port-last_port}
[interrupt | bypass]
SGOS#(config service-name) attribute {authenticate-401 {enable |
disable} | adn-optimize {enable | disable} | detect-protocol {enable |
disable} | reflect-client-ip {enable | disable} | use-adn {enable |
disable}}
SGOS#(config service-name) bypass {transparent | explicit | all |
ip_address | ip_address/subnet-mask} {port | first_port-last_port}
SGOS#(config service-name) exit
SGOS#(config service-name) intercept {transparent | explicit | all |
ip_address | ip_address/subnet-mask} {port | first_port-last_port}
SGOS#(config service-name) remove {transparent | explicit | all |
ip_address | ip_address/subnet-mask} {port | first_port-last_port}
```

Section A: Creating an HTTP Proxy Service

```
SGOS#(config service-name) view
```

[Section B: Overview: Configuring HTTP Proxy Performance](#)

Section B: Overview: Configuring HTTP Proxy Performance

You can configure HTTP proxy performance through setting:

- Default HTTP Proxy Policy
- HTTP Proxy Acceleration Profiles
- Byte Range
- Refresh Bandwidth
- Compression

Each of these topics is discussed below.

Understanding Default HTTP Proxy Policy

You can configure global defaults that determine HTTP proxy caching policy, such as the maximum size of cacheable objects, the length of time that negative responses remain in the cache, whether SGOS revalidates each object before serving it, whether the server certificate is verified by default, and how headers are parsed.

For information about setting default policy for HTTP proxy caching, see “[Understanding Tolerant HTTP Request Parsing](#)” on page 96.

HTTP Proxy Acceleration Profiles

You have a choice of three profiles to use for the SG appliance:

- Normal (the default setting) acts as a client accelerator, and is used for enterprise deployments
- Portal acts as a server accelerator, and is used for Web hosting
- Bandwidth Gain is used for ISP deployments

For information on HTTP profiles, see “[Customizing the HTTP Proxy Profile](#)” on page 88.

Byte-Range Support

If a client makes a request using the Range : HTTP header, SGOS serves the requested portions of the file from the cache if byte-range support is enabled (the default). If byte range support is disabled, all such requests are forwarded to the origin content server and the response is not cached. For information on using byte-range support to determine how SGOS handles byte-range requests, see “[Configuring HTTP for Bandwidth Gain](#)” on page 93.

Section B: Overview: Configuring HTTP Proxy Performance

Refresh Bandwidth

Refresh bandwidth refers to server-side bandwidth used for all forms of asynchronous refresh activity. The default configuration is to allow the SG appliance to manage refresh bandwidth. The SG appliance manages the bandwidth in order to preserve the maximum freshness of accessed objects. However, sometimes the automatic refresh bandwidth amount is too high. It is not unusual for refresh bandwidth to spike up occasionally, depending on access patterns at the time. If necessary, you can impose a limit on refresh bandwidth. To limit the refresh bandwidth to a specified amount, you must disable automatic management of the bandwidth and explicitly set a bandwidth limit. Setting the refresh bandwidth amount too low can lower the estimated freshness of objects in the cache. If you set the refresh bandwidth amount to zero, the SG appliance does not do active refresh at all.

For information about configuring refresh bandwidth, see “[Configuring Refresh Bandwidth for the HTTP Proxy](#)” on page 95.

Compression

Compression is disabled by default. If compression is enabled, the HTTP proxy forwards the supported compression algorithm (either deflate or gzip) from the client’s request (`Accept-Encoding`: request header) to the server as is, and attempts to send compressed content to client whenever possible. This allows SGOS to send the response as is when the server sends compressed data, including non-cacheable responses. Any unsolicited encoded response is forwarded as is to the client.

For more information on compression, see “[Understanding HTTP Compression](#)” on page 97.

Related CLI Syntax to Configure HTTP:

```
SGOS#(config) http
□ The following subcommands are available:
SGOS#(config) http [no] add-header client-ip
SGOS#(config) http [no] add-header front-end-https
SGOS#(config) http [no] add-header via
SGOS#(config) http [no] add-header x-forwarded-for
SGOS#(config) http [no] byte-ranges
SGOS#(config) http [no] cache authenticated-data
SGOS#(config) http [no] cache expired
SGOS#(config) http [no] cache personal-pages
SGOS#(config) http [no] force-ntlm
SGOS#(config) http ftp-proxy-url root-dir
SGOS#(config) http ftp-proxy-url user-dir
SGOS#(config) http [no] parse meta-tag {cache-control | expires | pragma-no-cache}
SGOS#(config) http [no] persistent client
SGOS#(config) http [no] persistent server
SGOS#(config) http [no] persistent-timeout client num_seconds
SGOS#(config) http [no] persistent-timeout server num_seconds
SGOS#(config) http [no] pipeline client {requests | redirects}
SGOS#(config) http [no] pipeline prefetch {requests | redirects}
SGOS#(config) http [no] proprietary-headers bluecoat
```

Section B: Overview: Configuring HTTP Proxy Performance

```
SGOS#(config) http receive-timeout client num_seconds
SGOS#(config) http receive-timeout refresh num_seconds
SGOS#(config) http receive-timeout server num_seconds
SGOS#(config) http [no] revalidate-pragma-no-cache
SGOS#(config) http [no] strict-expiration refresh
SGOS#(config) http [no] strict-expiration serve
SGOS#(config) http [no] strip-from-header
SGOS#(config) http [no] substitute conditional
SGOS#(config) http [no] substitute ie-reload
SGOS#(config) http [no] substitute if-modified-since
SGOS#(config) http [no] substitute pragma-no-cache
SGOS#(config) http [no] tolerant-request-parsing
SGOS#(config) http upload-with-pasv disable
SGOS#(config) http upload-with-pasv enable
SGOS#(config) http version {1.0 | 1.1}
SGOS#(config) http [no] www-redirect
SGOS#(config) http [no] xp-rewrite-redirect
```

Section C: Configuring the HTTP Proxy

Section C: Configuring the HTTP Proxy

Configuring the HTTP proxy, after the HTTP proxy services are set up, allows you to improve performance.

Discussed in this section are:

- ❑ “Setting Default HTTP Proxy Policy” on page 86
- ❑ “Customizing the HTTP Proxy Profile” on page 88
- ❑ “Understanding HTTP Proxy Profile Configuration Components” on page 89
- ❑ “Configuring HTTP for Bandwidth Gain” on page 93
- ❑ “Configuring Refresh Bandwidth for the HTTP Proxy” on page 95
- ❑ “Understanding Tolerant HTTP Request Parsing” on page 96
- ❑ “Understanding HTTP Object Types” on page 97
- ❑ “Understanding HTTP Compression” on page 97

Setting Default HTTP Proxy Policy

You can configure global defaults that determine HTTP proxy policy, such as the maximum size of cacheable objects, the length of time that negative responses remain in the cache, whether SGOS revalidates each object before serving it, whether the server certificate is verified by default, and how headers are parsed.

Other policy can be controlled only by using Blue Coat Content Policy Language (CPL).

To set HTTP default proxy policy:

1. From the Management Console, select **Configuration > Proxy Settings > HTTP Proxy > Policies**.



2. In the **Do not cache objects larger than** field, enter the maximum object size to cache. The default is 1024 MB. This configuration determines the maximum object size to store in the SG appliance. All objects retrieved that are greater than the maximum size are delivered to the client but are not stored in the SG appliance.

Section C: Configuring the HTTP Proxy

3. In the **Cache negative responses for** field, enter the number of minutes SGOS stores negative responses. The default is 0, meaning that the SG appliance does not cache negative responses and always attempts to retrieve the object.

The OCS might send a client error code (4xx HTTP response) or a server error code (5xx HTTP response) as a response to some requests. If the SG appliance is configured to cache such negative responses, it returns that response in subsequent requests for that page or image for the specified number of minutes. If it is not configured, which is the default, the SG appliance attempts to retrieve the page or image every time it is requested.

If you enter a number of minutes into this field, then the response times improve, but you could receive negative responses to requests that might otherwise have been served for that period of time.

4. To always verify that each object is fresh upon access, select the **Always check with source before serving object** checkbox. Enabling this setting has a significant impact on performance because HTTP proxy revalidates requested cached objects with the OCS before serving them to the client, resulting in a negative impact on response times and bandwidth gain. Therefore, do not enable this configuration unless absolutely required.
5. If you communicate with an origin content server (OCS) through HTTPS and want the OCS certificate to be verified, be sure that **Verify server certificate for secure connections** is selected.
6. The default is to parse HTTP meta tag headers in HTML documents if the MIME type of the object is text/HTML. The function of all meta tags is same as the corresponding HTTP headers.

To disable meta-tag parsing, deselect the checkbox for:

- **Parse “cache-control” meta tag**
- **Parse “expires” meta tag**
- **Parse “pragma-no-cache” meta tag**

7. Click OK; click **Apply**.

Tips on Parsing Meta Tags

- If ICAP response modification is occurring, the response body modified by the ICAP server is not parsed.
- Relevant HTTP meta tags must appear within the first 256 bytes of HTTP object body. If the meta tag does not appear within the first 256 bytes, it is ignored.

Tips on Using Meta Tags With Policy

- The following CPL properties can be used in the <Cache> layer to control meta tag processing for HTTP proxy, HTTP refresh, and HTTP pipeline transactions:
 - `http.response.parse_meta_tag.Pragma.no-cache (yes|no)`
 - `http.response.parse_meta_tag.Cache-Control (yes|no)`
 - `http.response.parse_meta_tag.Expires (yes|no)`
- VPM support for this feature is not available.

Section C: Configuring the HTTP Proxy

Related CLI Syntax to Set HTTP Proxy Default Policy

- To enter configuration mode:

```
SGOS#(config) caching
SGOS#(config caching)
```

- The following subcommands are available:

```
SGOS#(config caching) always-verify-source
SGOS#(config caching) max-cache-size megabytes
SGOS#(config caching) refresh automatic
SGOS#(config caching) refresh bandwidth kbps
```

```
SGOS#(config) http parse meta-tag {cache-control | expires | pragma-no-cache}
```

Customizing the HTTP Proxy Profile

You can select from among three profiles for the HTTP proxy, depending on your needs, and you can also create a customized profile from the three available.

The three profiles are:

- Normal, which acts as a client-accelerator and is used for enterprise deployments
- Portal, which acts as a server accelerator and is used for Web-hosting
- Bandwidth, which is used for ISP deployments

The table below shows the configuration for each profile.

Table 8-1. Normal, Portal, and Bandwidth Gain Profiles

Configuration	Normal Profile	Portal Profile	Bandwidth Gain
Pipeline embedded objects in client requests	Enabled	Disabled	Disabled
Pipeline embedded objects in prefetch requests	Enabled	Disabled	Disabled
Pipeline redirects for client requests	Enabled	Disabled	Disabled
Pipeline redirects for prefetch requests	Enabled	Disabled	Disabled
Cache expired objects	Enabled	Disabled	Enabled
Bandwidth Gain Mode	Disabled	Disabled	Enabled
Substitute GET for IMS (if modified since)	Disabled	Enabled	Enabled
Substitute GET for PNC (Pragma no cache)	Disabled	Enabled	Does not change
Substitute GET for HTTP 1.1 conditionals	Disabled	Enabled	Enabled
Substitute GET for IE (Internet Explorer) reload	Disabled	Enabled	Does not change
Never refresh before expiration	Disabled	Enabled	Enabled
Never serve after expiration	Disabled	Enabled	Does not change

Section C: Configuring the HTTP Proxy

When an SG appliance is first manufactured, it is set to a *Normal* profile. Depending on your needs, you can use the *Bandwidth Gain* profile or the *Portal* profile. You can also combine needed elements of all three profiles.

Using the Normal Profile

Normal is the default profile and can be used wherever the SG appliance is used as a normal forward proxy. This profile is typically used in enterprise environments, where the freshness of objects is more important than controlling the use of server-side bandwidth. The Normal profile is the profile that most follows the HTTP standards concerning object revalidation and staleness. Additionally, prefetching (pipelining) of embedded objects and redirects is enabled, which reduces response time for clients.

Using the Portal Profile

When configured as a server accelerator, the SG appliance improves object response time to client requests, scalability of the origin content server (OCS) site, and overall Web performance at the OCS. A server accelerator services requests meant for an OCS as if it is the OCS itself.

Because an OCS can actually consist of many servers—a single Web server or an entire server farm—OCSs are identified by domain name or IP address. To the SG appliance, the domain name or IP address is treated as the OCS, regardless of how many back-end Web servers might be installed.

Using the Bandwidth Gain Profile

The Bandwidth-Gain profile is useful wherever server-side bandwidth is an important resource. This profile is typically used in Internet Service Provider (ISP) deployments. In such deployments, the freshness of the object is not as important as controlling the use of server-side bandwidth. The Bandwidth-Gain profile enables various HTTP configurations that can increase page response times and the likelihood that stale objects are served, but that reduces the amount of server-side bandwidth required.

Understanding HTTP Proxy Profile Configuration Components

Table 8-2 gives a definition of the customizable HTTP proxy profile settings. Both the Management Console field and CLI (`config`) command text is included.

Table 8-2. Description of Profile Configuration Components

Management Console Checkbox Field	CLI (<code>config</code>) Command	Definition
Pipeline embedded objects in client request	<code>http [no] pipeline client requests</code>	This configuration item applies only to HTML responses. When this setting is enabled, and the object associated with an embedded object reference in the HTML is not already cached, HTTP proxy acquires the object's content before the client requests the object. This improves response time dramatically. If this setting is disabled, HTTP proxy does not acquire embedded objects until the client requests them.

Section C: Configuring the HTTP Proxy

Table 8-2. Description of Profile Configuration Components (Continued)

Management Console Checkbox Field	CLI (config) Command	Definition
Pipeline redirects for client request	<code>http [no] pipeline client redirects</code>	When this setting is enabled, and the response of a client request is one of the redirection responses (such as 301, 302, or 307 HTTP response code), then HTTP proxy pipelines the object specified by the <code>Location</code> header of that response, provided that the redirection location is an HTML object. This feature improves response time for redirected URLs. If this setting is disabled, HTTP proxy does not pipeline redirect responses resulting from client requests.
Pipeline embedded objects in prefetch request	<code>http [no] pipeline prefetch requests</code>	This configuration item applies only to HTML responses resulting from pipelined objects. When this setting is enabled, and a pipelined object's content is also an HTML object, and that HTML object has embedded objects, then HTTP proxy also pipelines those embedded objects. This nested pipelining behavior can occur three levels deep at most. If this setting is disabled, HTTP proxy does not engage in nested pipelining behavior.
Pipeline redirects for prefetch request	<code>http [no] pipeline prefetch redirects</code>	When this setting is enabled, HTTP proxy pipelines the object specified by a redirect location returned by a pipelined response. If this setting is disabled, HTTP proxy does not try to pipeline redirect locations resulting from a pipelined response.
Substitute Get for IMS	<code>http [no] substitute if-modified-since</code>	<p>If the time specified by the <code>If-Modified-Since:</code> header in the client's conditional request is greater than the last modified time of the object in the cache, it is a strong indication that the copy in the cache is stale. If so, HTTP proxy does a conditional GET to the OCS, based on the last modified time of the cached object.</p> <p>To control this aspect of the SGOS treatment of the <code>If-Modified-Since:</code> header, disable the Substitute Get for IMS setting. When this setting is disabled, a client time condition greater than the last modified time of the object in the cache does not trigger revalidation of the object.</p> <p>However, not all objects necessarily have a last-modified time specified by the OCS.</p>

Section C: Configuring the HTTP Proxy

Table 8-2. Description of Profile Configuration Components (Continued)

Management Console Checkbox Field	CLI (config) Command	Definition
Substitute Get for HTTP 1.1 conditionals	<code>http [no] substitute conditional</code>	<p>HTTP 1.1 provides additional controls to the client over the behavior of caches concerning the staleness of the object. Depending on various Cache-Control: headers, the SG appliance can be forced to consult the OCS before serving the object from the cache. For more information about the behavior of various Cache-Control: header values, refer to RFC 2616.</p> <p>If the Substitute Get for HTTP 1.1 Conditionals setting is enabled, HTTP proxy ignores the following Cache-Control: conditions from the client request:</p> <ul style="list-style-type: none"> • "max-stale" ["=" delta-seconds] • "max-age" "=" delta-seconds • "min-fresh" "=" delta-seconds • "must-revalidate" • "proxy-revalidate"
Substitute Get for PNC	<code>http [no] substitute pragma-no-cache</code>	<p>Typically, if a client sends an HTTP GET request with a Pragma: no-cache or Cache-Control: no-cache header (for convenience, both are hereby referred to as PNC), a cache must consult the OCS before serving the content. This means that HTTP proxy always re-fetches the entire object from the OCS, even if the cached copy of the object is fresh. Because of this, PNC requests can degrade proxy performance and increase server-side bandwidth utilization. However, if the Substitute Get for PNC setting is enabled, then the PNC header from the client request is ignored (HTTP proxy treats the request as if the PNC header is not present at all).</p>
Substitute Get for IE reload	<code>http [no] substitute ie-reload</code>	<p>Some versions of Internet Explorer issue the Accept: */* header instead of the Pragma: no-cache header when you click Refresh. When an Accept header has only the */* value, HTTP proxy treats it as a PNC header if it is a type-N object. You can control this behavior of HTTP proxy with the Substitute GET for IE Reload setting. When this setting is enabled, the HTTP proxy ignores the PNC interpretation of the Accept: */* header.</p>
Never refresh before expiration	<code>http [no] strict-expiration refresh</code>	<p>Applies only to cached type-T objects. When this setting is enabled, SGOS does not asynchronously revalidate such objects before their specified expiration time. When this setting is disabled, such objects, if they have sufficient relative popularity, can be asynchronously revalidated and can, after a sufficient number of observations of changes, have their estimates of expiration time adjusted accordingly.</p>

Section C: Configuring the HTTP Proxy

Table 8-2. Description of Profile Configuration Components (Continued)

Management Console Checkbox Field	CLI (config) Command	Definition
Never serve after expiration	http [no] strict-expiration serve	Applies only to cached type-T objects. If this setting is enabled, an object is synchronously revalidated before being served to a client, if the client accesses the object after its expiration time. If this setting is disabled, the object is served to the client and, depending on its relative popularity, may be asynchronously revalidated before it is accessed again.
Cache expired objects	http [no] cache expired	Applies only to type-T objects. When this setting is enabled, type-T objects that are already expired at the time of acquisition is cached (if all other conditions make the object cacheable). When this setting is disabled, already expired type-T objects become non-cacheable at the time of acquisition.
Enable Bandwidth Gain Mode	bandwidth-gain {disable enable}	<p>This setting controls both HTTP-object acquisition after client-side abandonment and AAR (asynchronous adaptive refresh) revalidation frequency.</p> <ul style="list-style-type: none"> • HTTP-Object Acquisition When Bandwidth Gain mode is enabled, if a client requesting a given object abandons its request, then HTTP proxy immediately abandons the acquisition of the object from the OCS, if such an acquisition is still in progress. When bandwidth gain mode is disabled, the HTTP proxy continues to acquire the object from the OCS for possible future requests for that object. • AAR Revalidation Frequency Under enabled bandwidth gain mode, objects that are asynchronously refreshable are revalidated at most twice during their estimated time of freshness. With bandwidth gain mode disabled, they are revalidated at most three times. Not all asynchronously refreshable objects are guaranteed to be revalidated.

Configuring the HTTP Proxy Profile

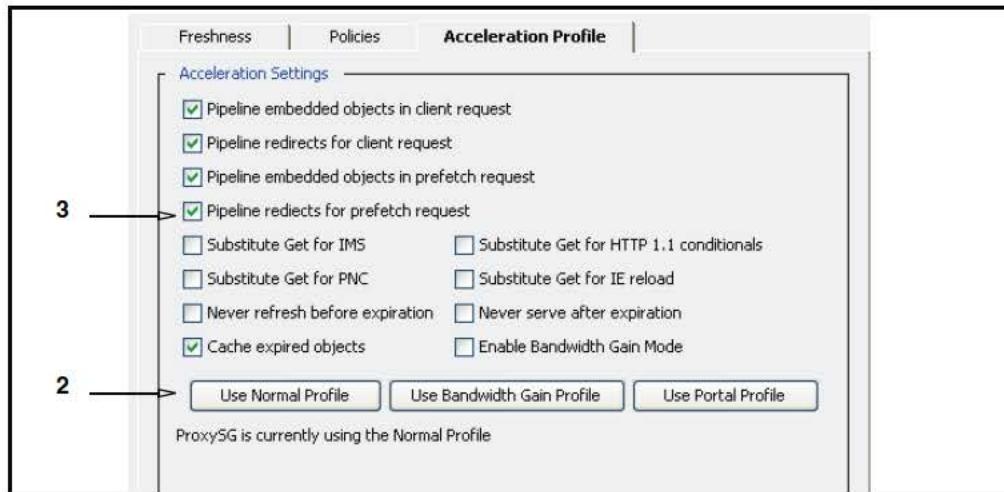
You can configure the profile using any of the components discussed above.

To configure the HTTP proxy profile:

- From the Management Console, select **Configuration > Proxy Settings > HTTP Proxy > Acceleration Profile**.

The Acceleration Profile tab displays (Normal is the default profile). Text appears at the bottom of this tab indicating which profile is selected. If you have a customized profile, this text does not appear.

Section C: Configuring the HTTP Proxy



Important: If you have a customized profile and you click one of the **Use Profile** buttons, no record of your customized settings remains. However, once the SG appliance is set to a specific profile, the profile is maintained in the event the SG appliance is upgraded.

2. To select a profile, click one of the three profile buttons (**Use Normal Profile**, **Use Bandwidth Gain Profile**, or **Use Portal Profile**).

The text at the bottom of the **Acceleration Profile** tab changes to reflect the new profile.

Note: You can customize the settings, no matter which profile button you select.

3. (Optional) To customize the profile settings, select or deselect any of the checkboxes (see Table 8-2 for information about each setting).
4. Click OK; click **Apply**.

Related CLI Syntax to Configure the HTTP Proxy Profile

```
SGOS#(config) profile {normal | portal | bwgain}
SGOS#(config) bandwidth-gain {disable | enable}
```

Configuring HTTP for Bandwidth Gain

In addition to the configuration items related to top-level profiles, other configurable items affect bandwidth gain. You can set the top-level profile and adjust various related configuration items to fine tune the SG appliance for the environment (see “[Configuring the HTTP Proxy Profile](#)” on page 92), and you can provide additional fine-tuning with the following configuration items:

- Byte-range support
- Revalidate pragma-no-cache

Byte-range requests can be made with a PNC header. To serve these requests from the cache, enable the revalidate PNC setting (see “[Understanding Revalidate Pragma-No-Cache](#)” on page 95).

Section C: Configuring the HTTP Proxy

Understanding Byte-Range Support

If a client requests a byte range using the Range: HTTP header, the SG appliance serves the requested portions of the file from the cache if byte-range support is enabled (the default). If byte range support is disabled, all such requests are forwarded in a non-cacheable way to the origin content server (OCS).

Byte-range configuration can significantly affect bandwidth gain where heavy use of range requests is expected. Download managers (such as NetAnts®) typically use byte-range requests heavily.

With byte-range support enabled, if the object is already cached and does not need to be reloaded from the OCS, the SG appliance serves the byte-range request from the cache only. But if the object is not in the cache, or if a reload of the object is required, SGOS might treat the byte-range request as if byte-range support is disabled and serve the object from the cache. It is important to note that HTTP proxy never caches partial objects, even if byte-range support is enabled.

If byte-range support is disabled, HTTP treats all byte-range requests as non-cacheable. Such requests are never served from the cache, even if the object exists in the cache. The client's request is sent unaltered to the OCS and the response is not cached. Thus a byte-range request has no effect on the cache if byte-range support is disabled.

HTTP proxy categorizes the range requests in following three categories when byte-range support is enabled:

- Type-1: 0-N: Range request for first N bytes of the object
- Type-2: N-M: Range request from N bytes to M bytes of the object
- Type-3: -N: Range request for last N bytes of the object

If the object does not exist in the cache, and a byte-range request is received with the first range being type-1 or type-2, and the start byte of the first requested range is within 14336 bytes (hard coded threshold), then the entire object is retrieved from the OCS and cached in the SG appliance. Even though HTTP proxy retrieves the entire object from the OCS, it sends an appropriate byte-range response to the client. If the object does not exist in the cache, and if the first range in the request is not of type-1 or type-2, or if the start byte of the first requested range is beyond 14336 bytes, then the client's request is sent unaltered to the OCS and the response is not cached.

If the object exists in the cache, and if a range request with an effective PNC (the PNC header is not substituted or revalidated—see "Understanding Revalidate Pragma-No-Cache" below) is made, and the first range in the request is either type-3 or type-1 or 2 with a start byte offset greater than 14336 bytes, then, even if the object exists in the cache, the transaction is made non-cacheable (the request is sent to the OCS without any modification and the response is not cached). If an object exists in the cache and a byte-range request is made without the PNC header, then the byte-range response is satisfied from the cache.

Most download managers make byte-range requests with a PNC header. To serve such requests from the cache, the revalidate pragma-no-cache option should be configured along with byte-range support (see "[Understanding Revalidate Pragma-No-Cache](#)" below).

To configure byte-range support:

Note: Enabling or disabling byte-range support can only be configured through the CLI.

Section C: Configuring the HTTP Proxy

To enable or disable byte-range support, enter one of the following commands at the (config) command prompt:

```
SGOS#(config) http byte-ranges  
-or-  
SGOS#(config) http no byte-ranges
```

Understanding Revalidate Pragma-No-Cache

The pragma-no-cache (PNC) header in a client’s request can affect the efficiency of the proxy from a bandwidth gain perspective (this behavior is described in [Table 8-2](#) in the **Substitute Get for PNC** configuration description). If you do not want to completely ignore PNC in client requests (which you can do by using the **Substitute Get for PNC** configuration), you can lower the impact of the PNC by enabling the revalidate-pragma-no-cache setting. When the revalidate-pragma-no-cache setting is enabled, a client’s non-conditional PNC-GET request results in a conditional GET request sent to the OCS if the object is already in the cache. This gives the OCS a chance to return the **304 Not Modified** response, thus consuming less server-side bandwidth, because it has not been forced to return full content even though the contents have not actually changed. By default, the revalidate PNC configuration is disabled and is not affected by changes in the top-level profile. When the **Substitute Get for PNC** configuration is enabled (see “[Configuring the HTTP Proxy Profile](#)” on page 92 for configuration information), the revalidate PNC configuration has no effect.

To configure the revalidate PNC setting:

Note: The revalidate pragma-no-cache setting can only be configured through the CLI.

To enable or disable the revalidate PNC setting, enter one of the following commands at the (config) command prompt:

```
SGOS#(config) http revalidate-pragma-no-cache  
-or-  
SGOS#(config) http no revalidate-pragma-no-cache
```

Configuring Refresh Bandwidth for the HTTP Proxy

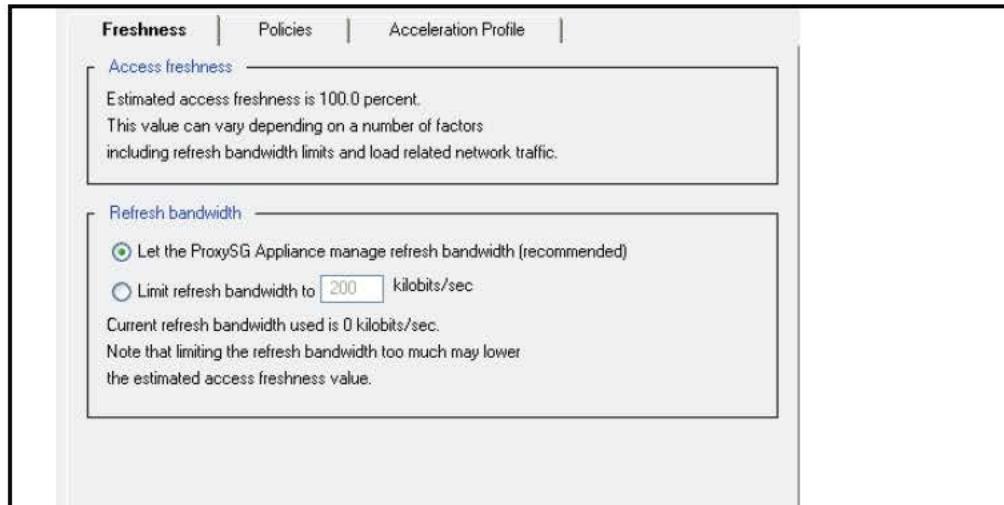
The SG appliance uses as much bandwidth as necessary for refreshing to achieve the desired access freshness.

The amount of bandwidth used varies depending on client demands. If you determine that the SG appliance is using too much bandwidth (by reviewing the logged statistics and examining current bandwidth used shown in the **Refresh bandwidth** field), you can specify a limit to the amount of bandwidth the SG appliance uses to try to achieve the desired freshness. Be aware, however, that if you limit the amount of bandwidth the SG appliance can use, you might prohibit the appliance from achieving the desired freshness. If the refresh bandwidth configuration remains at the recommended default—**Let the ProxySG Appliance manage refresh bandwidth (recommended)** in the Management Console or `SGOS#(config caching) refresh automatic` in the CLI—then the appliance uses whatever bandwidth is available in its efforts to maintain 99.9% estimated freshness of the next access.

Section C: Configuring the HTTP Proxy

To set refresh bandwidth:

- From the Management Console, select **Configuration > Proxy Settings > HTTP Proxy > Freshness**.



The **Refresh bandwidth** field displays the refresh bandwidth options. The default setting is to allow the SG appliance to manage refresh bandwidth automatically.

Important: Blue Coat strongly recommends that you not change the setting from the default.

- Do one of the following:
 - To turn off automatic bandwidth refresh, select **Limit refresh bandwidth to** (not recommended). Enter a new value into the **kilobits/sec** field, if necessary.
 - To return the appliance to automatic bandwidth refresh, select **Let the ProxySG Appliance manage refresh bandwidth (recommended)**.
- Click **OK**; click **Apply**.

Relevant CLI Syntax to Set Refresh Bandwidth

```
SGOS# (config) caching
 The following subcommands are available:
  SGOS# (config caching) refresh automatic
  SGOS# (config caching) refresh bandwidth kbps
```

Understanding Tolerant HTTP Request Parsing

By default, the SG appliance blocks malformed HTTP requests, returning a *400 Invalid Request* error. The tolerant HTTP request parsing flag causes certain types of malformed requests to be processed instead of being rejected.

By default, a header line not beginning with a <Tab> or space character must consist of a header name (which contains no <Tab> or space characters), followed by a colon, followed by an optional value, or an error is reported. With tolerant request parsing

Section C: Configuring the HTTP Proxy

enabled, a request header name is allowed to contain <Tab> or space characters, and if the request header line does not contain a colon, then the entire line is taken as the header name.

A header containing one or more <Tab> or space characters, and nothing else, is considered ambiguous. Blue Coat does not know if this is a blank continuation line or if it is the blank line that signals the end of the header section. By default, an ambiguous blank line is illegal, and an error is reported. With tolerant request parsing enabled, an ambiguous blank line is treated as the blank line that ends the header section.

To enable the HTTP tolerant request parsing flag:

Note: This feature is only available through the CLI.

From the (config) prompt, enter the following command to enable tolerant HTTP request parsing (the default is disabled):

```
SGOS#(config) http tolerant-request-parsing
```

To disable HTTP tolerant request parsing:

```
SGOS#(config) http no tolerant-request-parsing
```

Understanding HTTP Object Types

HTTP proxy categorizes HTTP objects into three types:

- Type-T: The OCS specifies explicit expiration time.
- Type-M: Expiration time is not specified; however, the last modified time is specified by the OCS.
- Type-N: Neither expiration nor last modified time has been specified.

The SGOS asynchronous adaptive refresh (AAR) algorithm is normally applied to all three types of HTTP objects. To maximize the freshness of the next access to objects in the cache, asynchronous revalidations are performed on those objects in accordance with their relative popularity and the amount of time remaining before their estimated time of expiration. Estimated expiration times vary as object content changes are observed during such asynchronous revalidations. This happens even for type-T objects because the expiration times of type-T objects are not always perfectly managed by Webmasters of content servers. However, for situations where such management can be trusted, certain configuration items exist to reduce speculative revalidation of type-T objects. In the following section, the terms revalidation and refresh mean the same thing—to assess the freshness of an object by sending a conditional GET request to the object's OCS.

Understanding HTTP Compression

Compression reduces a file size but does not lose any data. Whether you should use compression depends upon three resources: server-side bandwidth, client-side bandwidth, and SG CPU. If server-side bandwidth is more expensive in your environment than CPU, always request compressed content from the origin content server (OCS). However, if CPU is comparatively expensive, the SG appliance should instead be configured to ask the OCS for the same compressions that the client asked for and to forward whatever the server returns.

Section C: Configuring the HTTP Proxy

The default configuration assumes that CPU is costlier than bandwidth. If this is not the case, you can change the SG appliance behavior.

Note: Decompression, content transformation, and recompression increases response time by a small amount because of the CPU overhead. (The overhead is negligible in most cases.) RAM usage also increases if compression is enabled.

Compression might also appear to adversely affect bandwidth gain. Because compression results in a smaller file being served to the client than was retrieved by the SG appliance from the origin content server, bandwidth gain statistics reflect such requests/responses as negative bandwidth gain.

Compression is disabled by default. If compression is enabled, the HTTP proxy forwards the supported compression algorithm (gzip and deflate) from the client's request (`Accept-Encoding`: request header) to the server as is, and attempts to send compressed content to client whenever possible. This allows the SG appliance to send the response as is when the server sends compressed data, including non-cacheable responses. Any unsolicited encoded response is forwarded to the client as is.

Note: If compression is not enabled, the SG appliance does not compress the content if the server sends uncompressed content. However, the appliance continues to uncompress content if necessary to apply transformations.

Any unsolicited encoded response is forwarded to the client as is.

Compression is controlled by policy only.

You can view compression statistics by going to **Statistics > Protocol Details > HTTP/FTP History > Client Comp. Gain** and **Server Comp. Gain**.

For information on these statistics, see “[Viewing HTTP/FTP Statistics](#)” on page 105.

Understand Compression Behavior

The SG compression behavior is detailed in the tables below. Compression increases the overall percentage of cacheable content, increasing the hit rate in terms of number of objects served from the cache.

Note: A variant is the available form of the object in the cache—compressed or uncompressed. The Content-Encoding: header Identity refers to the uncompressed form of the content.

For cache-hit compression behavior, see [Table 8-3](#) below. For cache-miss compression behavior, see [Table 8-4](#).

Section C: Configuring the HTTP Proxy

Table 8-3. Cache-Hit Compression Behavior

Accept-Encoding: in client request	Variant Available when the Request Arrived	Variant Stored as a Result of the Request	Content-Encoding: in SG response
Identity	Uncompressed object	None	Identity
Identity	No uncompressed object gzip compressed	Uncompressed	Identity
gzip, deflate	Uncompressed object	gzip compressed	gzip
gzip, deflate	Uncompressed object gzip compressed	None	gzip
gzip, deflate	Uncompressed object deflate compressed	None	deflate
deflate	No uncompressed object gzip compressed	deflate compressed	deflate (This is effectively a cache-miss. The SG appliance does not convert from gzip to deflate.)

Table 8-4. Cache-Miss Compression Behavior

Accept-Encoding: in client request	Accept-Encoding: in SG request	Content-Encoding: in server response	Generated variants	Content-Encoding: in SG response
Identity	Identity	Identity	uncompressed object	Identity
gzip, deflate	gzip, deflate	Identity	uncompressed object gzip-compressed	gzip
gzip, deflate	gzip, deflate	gzip	No uncompressed object gzip-compressed	gzip
gzip, deflate, compress	gzip, deflate	gzip	No uncompressed object gzip-compressed	gzip
gzip, deflate	gzip, deflate	compress (illegal response)	compress	compress

Compression Exceptions

- The SG appliance issues a `transformation_error` exception (HTTP response code 403), when the server sends an unknown encoding and the appliance is configured to do content transformation.
- The SG appliance issues an `unsupported_encoding` exception (HTTP response code 415 - Unsupported Media Type) when the appliance is unable to deliver content due to configured policy.

Section C: Configuring the HTTP Proxy

The messages in the exception pages can be customized. For information on using exception pages, refer to *Volume 7: VPM and Advanced Policy*.

Configuring Compression

Compression behavior can only be configured through policy—VPM or CPL.

Using VPM to Configure Compression Behavior

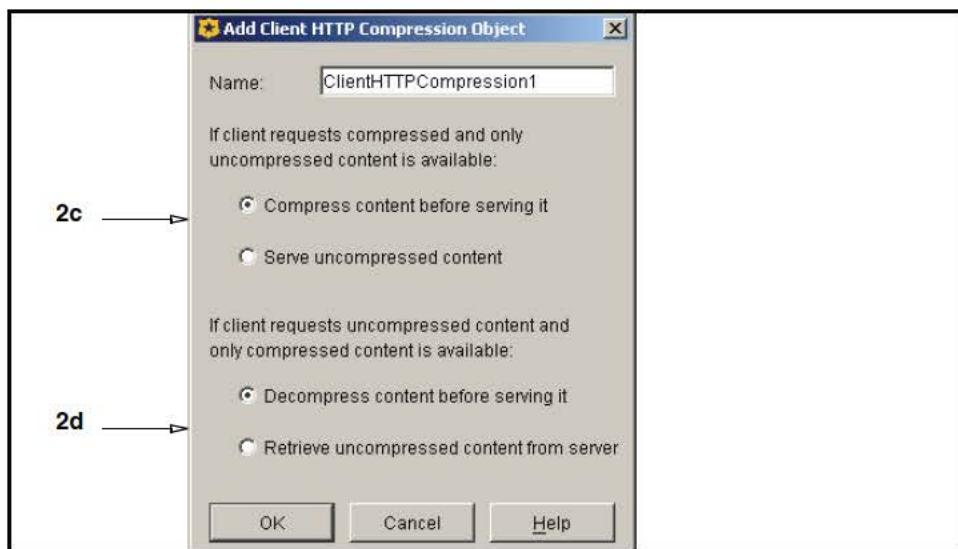
Three objects can be used to configure compression and compression levels through VPM:

- Client HTTP compression object: Allows you to determine the behavior when the client wants the content in a different form than is in the cache.
- Server HTTP compression object: Allows you to enable or disable compression and to set options.
- HTTP compression level object: Allows you to set a compression level of low, medium, or high.

Complete the following steps to manage server and client HTTP compression and compression levels.

To add or edit client compression:

1. Create a Web Access Layer:
 - a. From the Management Console, select **Configuration > Policy > Visual Policy Manager**; click **Launch**.
 - b. Select **Policy > Add Web Access Layer** from the menu of the Blue Coat VPM window that appears.
 - c. Type a layer name into the dialog that appears and click **OK**.
2. Add an Action object:
 - a. Right click on the item in the **Action** column; select **Set**.
 - b. Click **New** in the Set Action Object dialog that appears; select **Set Client HTTP Compression**.



Section C: Configuring the HTTP Proxy

- c. Select the compression options you want to use; click **OK**.
- d. Click **OK** again; close the VPM window and click **Yes** in the dialog to save your changes.

To add or edit server compression:

1. Create a Web Access Layer:
 - a. From the Management Console, select **Configuration > Policy > Visual Policy Manager**; click **Launch**.
 - b. Select **Policy > Add Web Access Layer** from the menu of the Blue Coat VPM window that appears.
 - c. Type a layer name into the dialog that appears and click **OK**.
2. Add an Action object:
 - a. Right click on the item in the **Action** column; select **Set**.
 - b. Click **New** in the Set Action Object dialog that appears; select **Set Server HTTP Compression**.
 - c. Select compression options; click **OK**.
 - d. Click **OK** again; close the VPM window and click **Yes** in the dialog to save your changes.

Using VPM to Set HTTP Compression Levels

You can control the compression level based on any transaction condition (such as the client IP address, the hostname, request/response headers, and the like).

To set compression levels:

1. Create a Web Access Layer:
 - From the Management Console, select **Configuration > Policy > Visual Policy Manager**; click **Launch**.
 - Select **Policy > Add Web Access Layer** from the menu of the Blue Coat VPM window that appears.
 - Type a layer name into the dialog that appears and click **OK**.
2. Add an Action object:
 - Right click on the item in the **Action** column; select **Set**.
 - Click **New** in the Set Action Object dialog that appears; select **Set HTTP Compression Level**.
 - Select the compression level needed; click **OK**.
 - Click **OK** again; close the VPM window and click **Yes** in the dialog to save your changes.

Using Policy to Configure Compression Behavior

Compression and decompression are allowed if compression is enabled. If compression is not enabled, neither compression nor decompression are allowed.

Section C: Configuring the HTTP Proxy

Policy controls the compression or decompression of content on the SG appliance. If compression is turned off, uncompressed content is served to the client if a compressed variant is not available. If decompression is disabled, an uncompressed version is fetched from the OCS if the variant does not exist and the client requested uncompressed content.

Note: The SG appliance decompresses the content if transformation is to be applied, even if the compression is not enabled.

You can use server-side or client-side controls to manage compression through policy, as described in the following table.

Table 8-5. Compression Properties

Compression Properties	Description
<code>http.allow_compression(yes no)</code>	Allow the SG appliance to compress content on demand if needed.
<code>http.allow_decompression(yes no)</code>	Allow the SG appliance to decompress content on demand if needed.
<code>http.compression_level(low medium high)</code>	Set the compression level to be low (1), medium (6), or high (9). Low is the default.
<code>http.server.accept_encoding(client)</code>	Turn on only client encodings
<code>http.server.accept_encoding(identity)</code>	Turn off all encodings
<code>http.server.accept_encoding(all)</code>	Turn on all supported encodings, including the client's encodings.
<code>http.server.accept_encoding(gzip, deflate)</code>	Send specific encodings (order sensitive)
<code>http.server.accept_encoding(gzip, client)</code>	Send specific encodings (order sensitive)
<code>http.server.accept_encoding.gzip(yes no)</code>	Add/remove an encoding
<code>http.server.accept_encoding[gzip, deflate, identity](yes no)</code>	Add/remove a list of encodings
<code>http.server.accept_encoding.allow_unknown(yes no)</code>	Allow/disallow unknown encodings.
<code>http.client.allow_encoding(identity);</code>	Allow no encodings (send uncompressed).
<code>http.client.allow_encoding(client);</code>	Allow all client encodings. This is the default.
<code>http.client.allow_encoding(gzip, deflate);</code>	Allow fixed set of encodings.
<code>http.client.allow_encoding(gzip, client);</code>	Allow fixed set of encodings.
<code>http.client.allow_encoding.gzip(yes no);</code>	Add/remove one encoding

Section C: Configuring the HTTP Proxy

Table 8-5. Compression Properties (Continued)

Compression Properties	Description
http.client.allow_encoding [gzip, deflate, identity] (yes no);	Add/remove list of encodings

Default Behavior

By default, Blue Coat sends the client's list of the accept encoding algorithms, except for unknown encodings. If compression is not enabled, the default overrides any configured CPL policy.

If Accept-Encoding request header modification is used, it is overridden by the compression related policy settings shown in [Table 8-5](#). The Accept-Encoding header modification can continue to be used if no compression policies are applied, or if compression is not enabled. Otherwise, the compression-related policies override any Accept-Encoding header modification, even if the Accept-Encoding header modification appears later in the policy file.

Adding encoding settings with client-side controls depend on if the client originally listed that encoding in its Accept-Encoding header. If so, these encodings are added to the list of candidates to be delivered to the client. The first cache object with an Accept-Encoding match to the client-side list is the one that is delivered.

Suggested Settings for Compression

- If client-side bandwidth is expensive in your environment, use the following policy:

```
<proxy>
    http.client.allow_encoding(client)
    http.allow_compression(yes)
```

- If server-side bandwidth is expensive in your environment, compared to client-side bandwidth and CPU:

```
http.server.accept_encoding(all)
http.server.accept_encoding.allow_unknown(no); default
http.allow_compression(yes)
http.allow_decompression(yes)
```

- If CPU is expensive in your environment, compared to server-side and client-side bandwidth:

```
http.server.accept_encoding(client); If no content transformation
policy is configured
http.server.accept_encoding(identity); If some content transformation
policy is configured
http.allow_compression(no); default
http.allow_decompression(no); default
```

Notes

- Policy-based content transformations are not stored as variant objects. If content transformation is configured, it is applied on all cache-hits, and objects might be compressed all the time at the end of such transformation if they are so configured.

Section C: Configuring the HTTP Proxy

- The variant that is available in the cache is served, even if the client requests a compression choice with a higher qvalue. For example, if a client requests `Accept-encoding: gzip;q=1, deflate;q=0.1`, and only a deflate-compressed object is available in the cache, the deflate compressed object is served.
- The HTTP proxy ignores `Cache-Control: no-transform` directive of the OCS. To change this, write policy to disallow compression or decompression if `Cache-Control: no-transform` response header is present.
- The SG appliance treats multiple content encoding (gzip, deflate or gzip, gzip) as an unknown encoding. (These strings indicate the content has been compressed twice.)
- The gzip and deflate formats are treated as completely separate and are not converted from one to the other.
- Blue Coat recommends using `gzip` encoding (or allowing both `gzip` and `deflate`) when using the HTTP compression feature.
- If the SG appliance receives unknown content encoding and if content transformation is configured (such as popup blocking), an error results.
- If the origin server provides compressed content with a different compression level than that specified in policy, the content is not re-compressed.
- If the SG appliance compressed and cached content at a different compression level than the level specified in a later transaction, the content is not re-compressed.
- Parsing of container HTML pages occurs on the server side, so pipelining (prefetching) does not work when the server provides compressed content.
- Compressing a zip file breaks some browser versions, and compressing images does not provide added performance. For a current list of content types that are not compressed, refer to the Release Notes.
- All responses from the server can be compressed, but requests to the server, such as POST requests, cannot.
- Only `200 OK` responses can be compressed.

Section D: Viewing HTTP/FTP Statistics

Section D: Viewing HTTP/FTP Statistics

HTTP/FTP History Statistics

The HTTP/FTP History tabs (HTTP/HTTPS/FTP Objects, HTTP/HTTPS/FTP Bytes, HTTP/HTTPS /FTP Clients, Client Comp. Gain, and Server Comp. Gain) display bar graphs that illustrate the last 60 minutes, 24 hours, and 30 days for the number of HTTP/HTTPS/FTP objects served, the number of HTTP/HTTPS/FTP bytes served, the maximum number of active HTTP/HTTPS/FTP clients processed, and the HTTP/FTP client and server compression-gain statistics. Overall client and server compression-gain statistics are displayed under System Usage.

Note: You can view current HTTP statistics through the CLI using the `show http-stats` command.

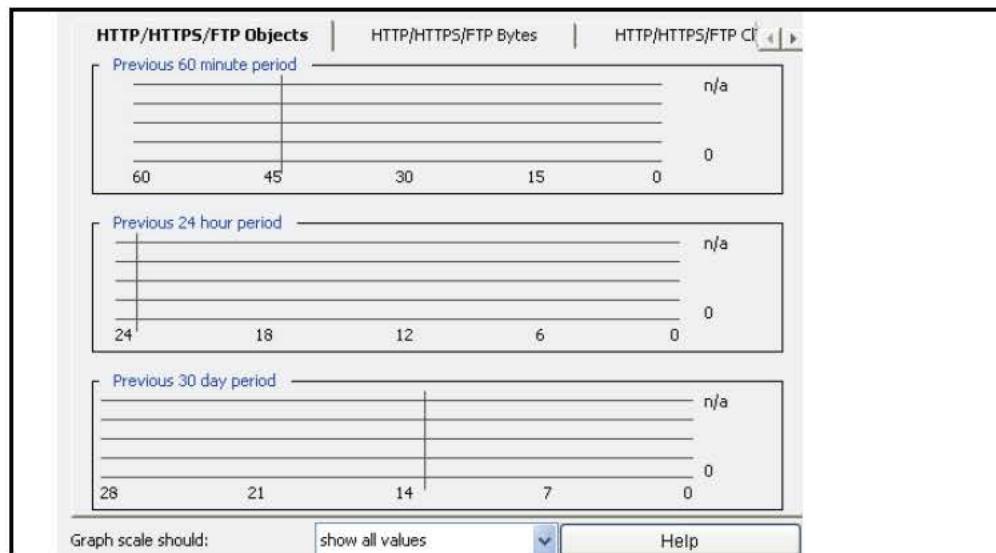
Viewing the Number of HTTP/FTP Objects Served

The HTTP/HTTPS/FTP Objects tab illustrates the device activity over the last 60 minutes, 24 hours, and 30 days. These charts illustrate the total number of objects served from either the cache or from the Web. To review the number of cached objects versus non-cached objects, view the **Efficiency** tabs

Note: The maximum number of objects that can be stored in a SG appliance is affected by a number of factors, including the SGOS version it is running and the hardware platform series

To view the number of HTTP/HTTPS/FTP objects served:

1. From the Management Console, select **Statistics > Protocol Details > HTTP/FTP History > HTTP/HTTPS/FTP Objects**.



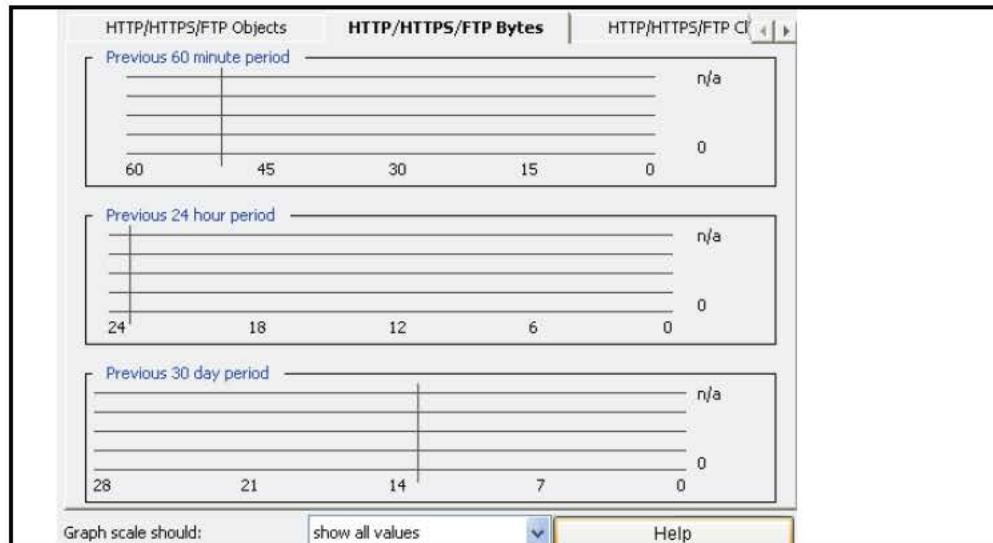
2. (Optional) To set the graph scale to a different value, select a value from the **Graph scale should** drop-down list.

Section D: Viewing HTTP/FTP Statistics**Viewing the Number of HTTP/HTTPS/FTP Bytes Served**

The Bytes tab shows the sum total of the number of bytes served from the device over the last 60 minutes, 24 hours, and 30 days. The chart shows the total number of bytes for objects served by the device, including both cache hits and cache misses.

To view the number of HTTP/HTTPS/FTP bytes served:

1. From the Management Console, select **Statistics > Protocol Details > HTTP/FTP History > HTTP/HTTPS/FTP Bytes**.



2. (Optional) To set the graph scale to a different value, select a value from the **Graph scale should** drop-down list.

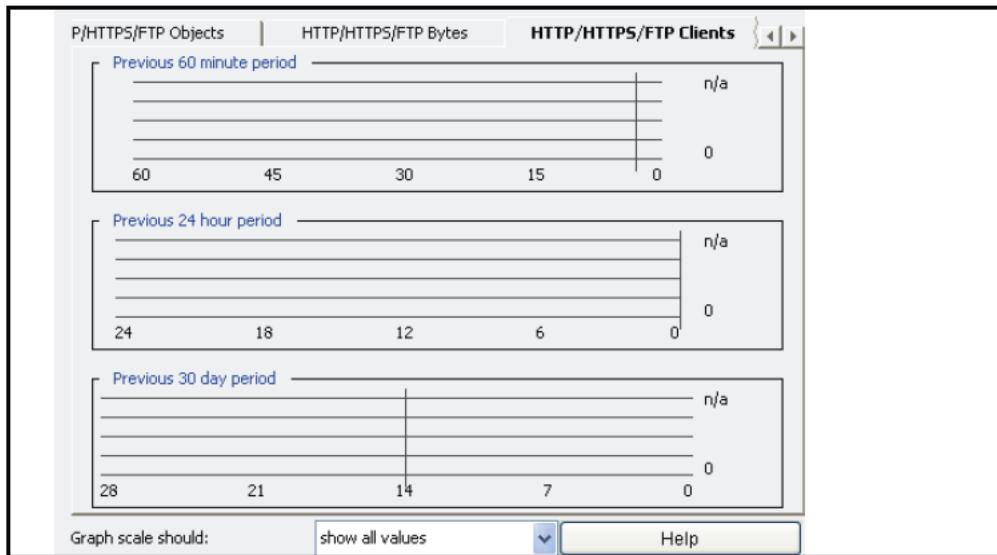
Viewing Active Client Connections

The HTTP/HTTPS/FTP Clients tab shows the maximum number of clients with requests processed over the last 60 minutes, 24 hours, and 30 days. This does not include idle client connections (connections that are open but that have not made a request). These charts allow you to monitor the maximum number of active clients accessing the SG appliance at any one time. In conjunction with the HTTP/HTTPS/FTP Objects and HTTP/HTTPS/FTP Bytes tabs, you can determine the number of clients supported based on load, or load requirements for your site based on a specific number of clients.

To view the number of active clients:

1. From the Management Console select **Statistics > Protocol Details > HTTP/FTP History > HTTP/HTTPS/FTP Clients**.

Section D: Viewing HTTP/FTP Statistics



2. (Optional) To set the graph scale to a different value, select a value from the **Graph scale should** drop-down list.

Viewing HTTP/FTP Client and Server Compression Gain Statistics

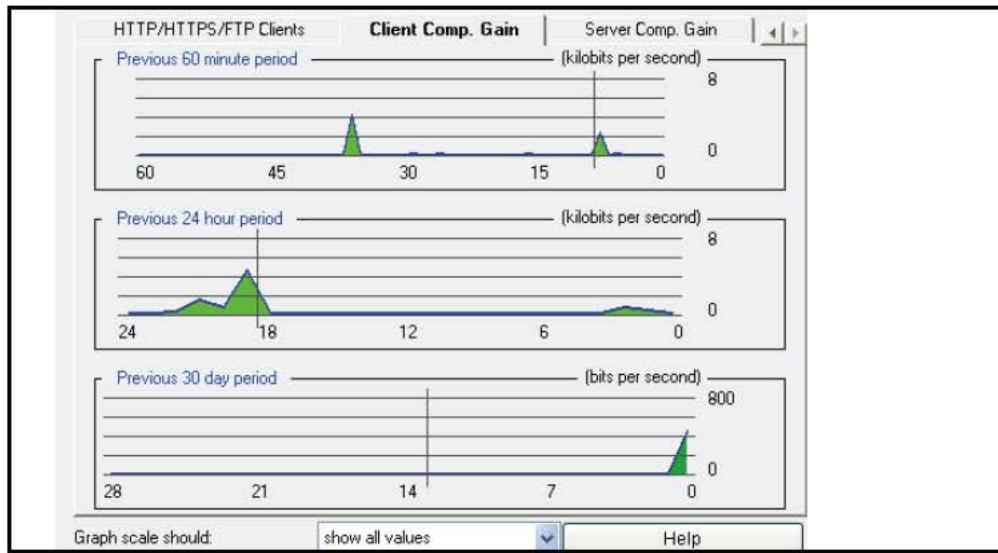
Under HTTP/FTP History, you can view HTTP/FTP client and server compression-gain statistics for the SG appliance over the last 60 minutes, 24 hours, and 30 days in the Client Comp. Gain and the Server Comp. Gain tabs. Overall client and server compression-gain statistics are displayed under System Usage. These statistics are not available through the CLI.

The green display on the bar graph represents uncompressed data; the blue display represents compressed data. Hover your cursor over the graph to see the compressed gain data.

To view HTTP/FTP client compressed gain statistics:

1. From the Management Console, select **Statistics > Protocol Details > HTTP/FTP History > Client Comp. Gain**.

Section D: Viewing HTTP/FTP Statistics



2. (Optional) To set the graph scale to a different value, select a value from the **Graph scale should** drop-down list.

To view HTTP/FTP server compressed gain statistics:

1. From the Management Console, select **Statistics > Protocol Details > HTTP/FTP History > Server Comp. Gain**.



2. (Optional) To set the graph scale to a different value, select a value from the **Graph scale should** drop-down list.

Section E: Using Explicit HTTP Proxy with Internet Explorer

Section E: Using Explicit HTTP Proxy with Internet Explorer

Internet Explorer does not allow OCS NTLM authentication through a SG appliance when explicitly proxied. To correct this, Blue Coat added a `Proxy-Support: Session-based-authentication` header that is sent by default when the SG appliance receives a 401 authentication challenge from upstream when the client connection is an explicit proxy connection.

For older browsers or if both the SG appliance and the OCS do NTLM authentication, the `Proxy-Support` header might not work. In this case, you can disable the header and instead enable `NTLM-force`, which converts the 401-type server authentication challenge to a 407-type proxy authentication challenge, supported by Internet Explorer. The SG appliance also converts the resulting `Proxy-Authentication` headers in client requests to standard server authorization headers, which allows an OCS NTLM authentication challenge to pass through when Internet Explorer is explicitly proxied through the appliance.

Disabling the Proxy-Support Header

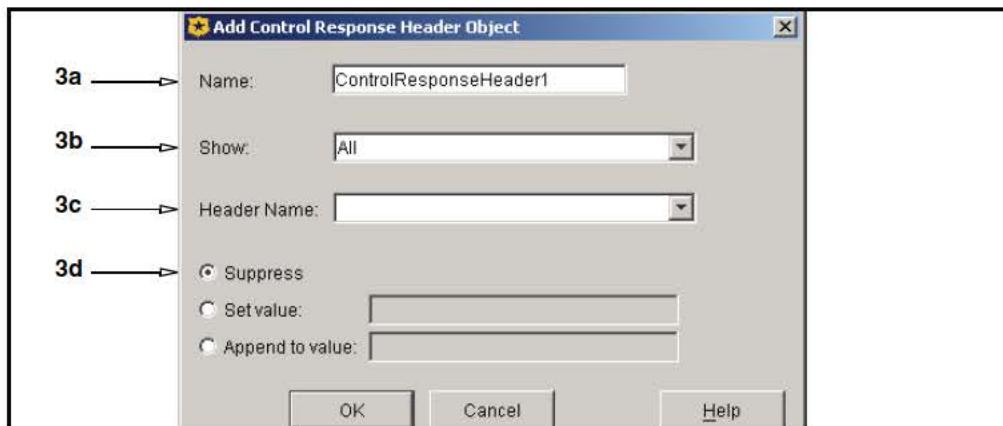
You can control the header using header modification policy. Suppression or modification of the `Proxy-Support` custom header keeps the SG appliance from sending this default header. Use either the Visual Policy Manager (VPM) or CPL to disable the header through policy. For complete information on using VPM, refer to *Volume 7: VPM and Advanced Policy*.

Note: To suppress the `Proxy-Support` header globally, use the `http force-ntlm` command to change the option. To suppress the header only in certain situations, continue with the procedures below.

To suppress the proxy-support header through VPM:

To suppress the header using VPM, create a new Web Access Layer. Then:

1. Right click in the **Action** field to see the drop-down list; select **Set**.
2. Click **New** to see the drop-down list; select **Control Response Header**.



Section E: Using Explicit HTTP Proxy with Internet Explorer

3. Fill in the fields as follows:
 - a. **Name:** Enter a meaningful name.
 - b. **Show:** Select **Custom** from the drop-down list.
 - c. **Header Name:** Enter Proxy-Support.
 - d. Make sure the **Suppress** radio button is selected.
4. Click OK; click **Apply**.

To suppress the proxy-support header through CPL:

Use CPL to define the Proxy-Support custom header object and to specify what action to take. The example below uses Proxy-Support as the action name, but you can choose any name meaningful to you. The result of this action is to suppress the Proxy-Support header

```
<proxy>
  action.Proxy-Support (yes)
  define action Proxy-Support
    delete(response.x_header.Proxy-Support)
  end action Proxy-Support
```

Enabling or Disabling NTLM Authentication for Internet Explorer Clients

The following procedure forces Internet Explorer clients explicitly-proxied through an SG appliance to participate in NTLM authentication. This CLI setting is global, affecting all clients. You can also use VPM or CPL to provide granular control for NTLM authentication. (See “[To force NTLM authentication through VPM:](#)” on page 110 and “[To force NTLM authentication through CPL:](#)” on page 110.) These commands should only be used if the proxy-support header is not suitable for the situation.

Note: These procedures can only be done through the CLI.

Do one of the following (note that the default is `http no force-ntlm`):

- To force NTLM authentication for Internet Explorer clients, enter the following command at the (config) command prompt:
`SGOS#(config) http force-ntlm`
- To disable NTLM authentication for Internet Explorer clients, enter the following command at the (config) command prompt:
`SGOS#(config) http no force-ntlm`

To force NTLM authentication through VPM:

To use VPM to force NTLM authentication, create a new Web Access Layer. Then:

1. Right click in the **Action** field to see the drop-down list; select **Set**.
2. Scroll to the **Force NTLM for Server Auth** static object; select it.
3. Click OK.

To force NTLM authentication through CPL:

Global configuration of NTLM authentication behavior is set through the CLI command `http force-ntlm` (the default is `http no force-ntlm`). The `http.force_ntlm_for_server_auth()` CPL property overrides the global settings for a particular subset.

Section E: Using Explicit HTTP Proxy with Internet Explorer

To create a rule to force NTLM authentication for explicitly proxied Internet Explorer clients, first define the action, then define the rule.

This example implements the following policies:

- All clients from the “ForceNTLM_subnet” have Force-NTLM turned on. These clients do not use the proxy-support header.
- Requests for all other hosts have Force-NTLM turned off. These hosts use the proxy-support header.

```
define subnet ForceNTLM_subnet
    10.10.0.0/16
end
<Proxy>
    client.address=ForceNTLM_subnet http.force_ntlm_for_server_auth(yes)
    http.force_ntlm_for_server_auth(no)
end
```

Using Web FTP

If HTTP is configured to be explicit, Internet Explorer version 6.0 users accessing FTP sites over HTTP must disable the browser setting **Enable folder view for FTP sites**. To access this attribute in Internet Explorer, select **Tools > Internet Options**, click the **Advanced** tab, deselect **Enable folder view for FTP sites**, and click **OK**.

For information on using FTP, see “[Managing the FTP Proxy](#)” on page 69.

Chapter 9: Creating and Editing an HTTPS Reverse Proxy Service

The Blue Coat HTTPS Reverse Proxy implementation:

- ❑ Combines hardware-based SSL acceleration with full caching functionality.
- ❑ Establishes and services incoming SSL sessions.
- ❑ Provides SSL v2.0, SSL v3.0, and TLSv1 protocol support.

Creating an HTTPS reverse proxy is unlike other proxies in that a number of preliminary steps are required before you can use the proxy.

Preliminary steps include:

- ❑ Creating or importing a keyring. (Refer to *Volume 5: Securing the Blue Coat SG Appliance* for information on creating or importing a keyring.)
- ❑ (If necessary) Creating Certificate Signing Requests (CSRs) that can be sent to Certificate Signing Authorities (CAs).
- ❑ Importing server certificates issued by CA authorities for external use and associate them with the keyring. (Refer to *Volume 5: Securing the Blue Coat SG Appliance*.)
-or-
❑ Creating certificates for internal use and associate them with the keyring.
❑ (Optional, if using server certificates from CAs) Importing Certificate Revocation Lists (CRLs) so the SG appliance can verify that certificates are still valid.

When these steps are complete, you can configure the HTTPS Reverse Proxy service.

A common scenario in using HTTPS Reverse Proxy, which connects the client to the SG appliance, is in conjunction with HTTPS *origination*, which is used to connect the appliance to the origin content server (OCS). For more information on this option, see [Section B: "Configuring HTTP or HTTPS Origination to the Origin Content Server" on page 117](#).

This chapter discusses:

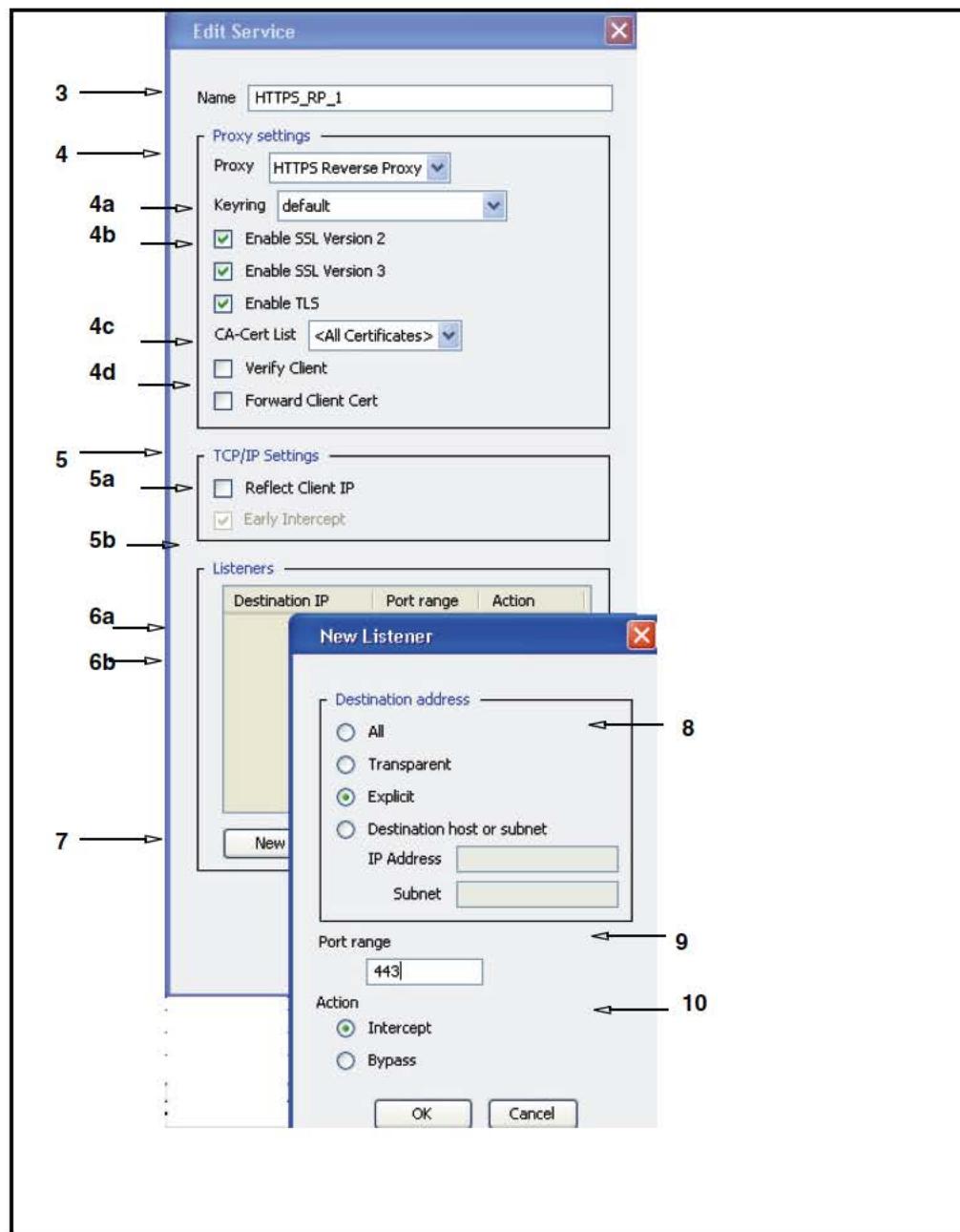
- ❑ [Section A: "Configuring the HTTPS Reverse Proxy"](#)
- ❑ [Section B: "Configuring HTTP or HTTPS Origination to the Origin Content Server" on page 117](#)

Section A: Configuring the HTTPS Reverse Proxy

Section A: Configuring the HTTPS Reverse Proxy

To configure the HTTPS reverse proxy:

1. Select Configuration > Services > Proxy Services.
2. Do one of the following:
 - To create a new HTTPS Reverse Proxy service, see 3.
 - To edit the listeners on an existing HTTPS Reverse Proxy service, highlight the HTTPS Reverse Proxy service you want to change and click **Edit**.



Section A: Configuring the HTTPS Reverse Proxy

3. Make sure the proxy has a meaningful name
4. Make sure that **HTTPS Reverse Proxy** is selected in the **Proxy settings** drop-down list.
 - a. **CA Cert List:** Use the drop-down list to select any already created list that is on the system.
 - b. **Forward Client Cert:** (Should be used with the **Verify Client** option.) Selecting this checkbox puts the extracted client certificate information into a header that is included in the request when it is forwarded to the OCS.
 - c. In the **Keyring** drop-down list, select any already created keyring that is on the system. The system ships with a default keyring that is reusable for each HTTPS service.

Note: The **configuration-passwords-key** keyring that shipped with the SG appliance does *not* contain a certificate.

The **appliance-key** keyring does contain a certificate if you have Internet connectivity, but it cannot be used for purposes other than appliance authentication. For information about appliance authentication, see Chapter 2 of *Volume 6: Advanced Networking*.

- d. **SSL Versions:** Use the drop-down list to select the version to use for this service. The default is SSL v2/v3 and TLS v1.
- e. **Verify Client** (Should be used with the **Forward Client Certificate** option.). Selecting this checkbox puts the extracted client certificate information into the Client-Cert header that is included in the request when it is forwarded to the origin content server. The header contains the certificate serial number, subject, validity dates, and issuer (all as name=value pairs). The actual certificate itself is not forwarded.
5. Select or de-select the checkboxes to configure the TCP/IP settings for your environment.
 - a. **Reflect-client-iP:** Determines how the client IP address is presented to the origin server for explicitly proxied requests
 - b. **Early intercept:** This option cannot be changed when creating or editing an HTTPS Reverse Proxy service.
6. Select or de-select checkboxes to configure ADN settings for your environment.
 - a. **Enable ADN:** Controls whether ADN is enabled for a specific service. Enabling ADN does not guarantee the connections are accelerated by ADN. The actual enable decision is determined by ADN routing (for explicit deployment) and network setup (for transparent deployment)
 - b. The **Optimize Bandwidth** checkbox is selected by default if you enabled ADN optimization during initial configuration. You should de-select the checkbox if you are not configuring ADN optimization.
7. Click **New** to add a new listener to the HTTPS Reverse Proxy; click **Edit** to change the current settings.
8. Select a Destination IP address from the drop-down list.
9. Identify the port where you want this service to listen.
10. Select the default behavior for the service: **Bypass** tells the service to ignore any traffic. **Intercept** configures the service to intercept the traffic that is being proxied.

Section A: Configuring the HTTPS Reverse Proxy

11. Click **OK**.

Relevant CLI Syntax to Create/Edit an HTTPS-Reverse-Proxy Service

- To enter configuration mode for the service:

```
SGOS#(config) proxy-services
SGOS#(config proxy-services) create https-reverse-proxy service-name
SGOS#(config proxy-services) edit service-name
```

- The following subcommands are available:

```
SGOS#(config service-name) add {transparent | explicit | all |
ip_address | ip_address/subnet-mask} {port | first_port-last_port}
[intercept | bypass]
SGOS#(config service-name) attribute {ccl list_name | cipher-suite
cipher-suite | forward-client-cert {enable | disable}| keyring
keyring_id | reflect-client-ip {enable | disable}| ssl-versions {sslv2
| sslv3 | tlsv1 | sslv2v3 | sslv2tlsv1 | sslv3tlsv1 | sslv2v3tlsv1} |
use-adn {enable | disable}| verify-client {enable | disable}}
SGOS#(config service-name) bypass {transparent | explicit | all |
ip_address | ip_address/subnet-mask} {port | first_port-last_port}
SGOS#(config service-name) exit
SGOS#(config service-name) intercept {transparent | explicit | all |
ip_address | ip_address/subnet-mask} {port | first_port-last_port}
SGOS#(config service-name) remove {transparent | explicit | all |
ip_address | ip_address/subnet-mask} {port | first_port-last_port}
SGOS#(config service-name) view
```

Section B: Configuring HTTP or HTTPS Origination to the Origin Content Server

Section B: Configuring HTTP or HTTPS Origination to the Origin Content Server

In previous procedures, you configured HTTPS Reverse Proxy to the SG appliance. In two common termination scenarios, you must also configure HTTPS origination to the Origin Content Server (OCS).

The first two scenarios are used to provide a secure connection between the proxy and server, if, for example, the proxy is in a branch office and is not co-located with the server.

Figure 9-1. Scenario 1: HTTPS Reverse Proxy with HTTPS Origination

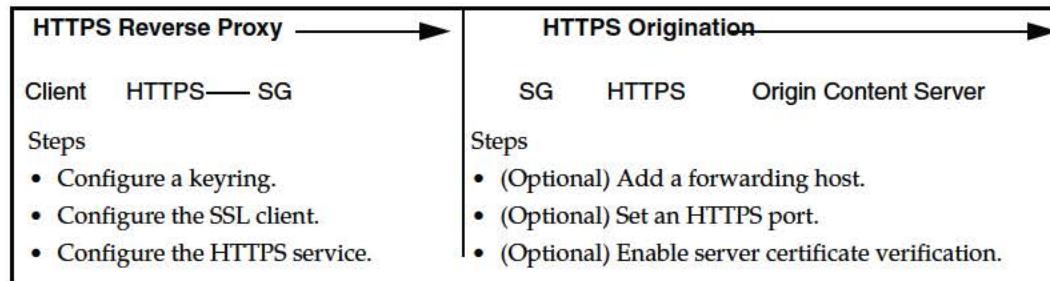
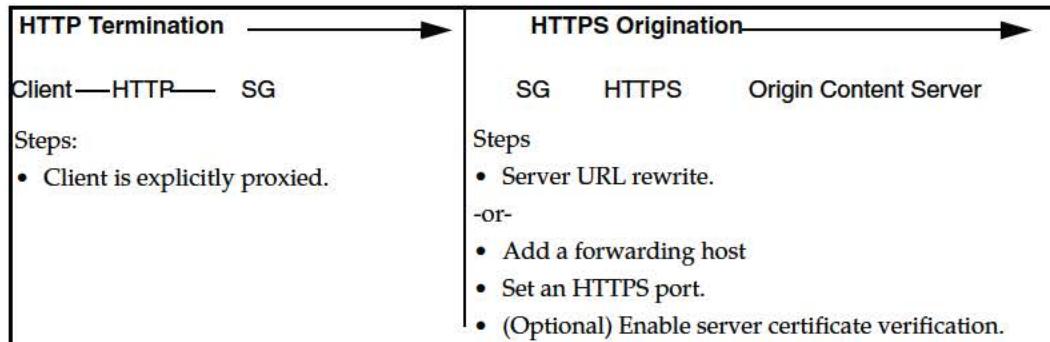


Figure 9-2. Scenario 2: HTTP Termination with HTTPS Origination



Using server URL rewrite is the preferred method. For information on rewriting the server URL, refer to *Volume 11: Blue Coat SG Appliance Content Policy Language Guide*.

To configure HTTPS origination:

At the (config) command prompt, enter the following commands:

```
SGOS#(config forwarding) create host_alias hostname
https [=port_number] server ssl-verify-server=yes
```

where:

Table 9-1. HTTPS Origination Commands

Option	Parameters	Description
host_alias	alias_name	Specifies the alias name of the OCS.
host_name		Specifies the hostname or IP address of the OCS, such as www.bluecoat.com .
https	[=port_number]	Specifies the port number on which the OCS is listening.

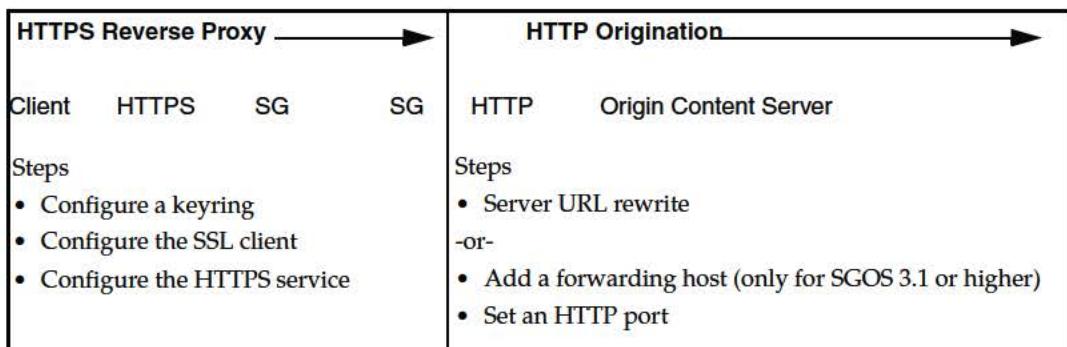
Section B: Configuring HTTP or HTTPS Origination to the Origin Content Server

Table 9-1. HTTPS Origination Commands (Continued)

Option	Parameters	Description
server		Specifies to use the relative path for URLs in the HTTP header because the next hop is a Web server, not a proxy server. Proxy is the default.
ssl-verify-server=	yes no	Specifies whether the upstream server certificate should be verified. You can only enable this command if the upstream host is a server, not a proxy.

The next scenario is useful when the SG appliance is deployed as a reverse proxy. This scenario is used when it's not necessary for a secure connection between the proxy and server. For information on using the SG appliance as a reverse proxy, see “[Customizing the HTTP Proxy Profile](#)” on page 88.

Figure 9-3. Scenario 3: HTTPS Reverse Proxy with HTTP Origination



Using server URL rewrite is the preferred method. For information on rewriting the server URL, refer to *Volume 11: Blue Coat SG Appliance Content Policy Language Guide*.

You can only configure HTTP origination through the CLI. You cannot use the Management Console.

To configure HTTP origination:

At the (config) command prompt, enter the following commands:

```
SGOS#(config forwarding) create host_alias host_name
      http [=port_number] server
```

where:

Table 9-2. HTTP Origination Commands

<i>host_alias</i>	<i>alias_name</i>	Specifies the alias name of the OCS.
<i>host_name</i>		Specifies the hostname or IP address of the OCS, such as www.bluecoat.com .
<i>http</i>	<i>[=port_number]</i>	Specifies the port number on the OCS in which HTTP is listening.
<i>server</i>		server specifies to use the relative path for URLs in the HTTP header because the next hop is a Web server, not a proxy server. Proxy is the default.

Section B: Configuring HTTP or HTTPS Origination to the Origin Content Server

Creating Policy for HTTP and HTTPS Origination

Forwarding hosts must be already created on the SG appliance before forwarding policy can be created.

To create a policy using CPL:

```
<forward>
  url.host=host_name forward(host_alias)
```

To create a policy using VPM:

1. In the VPM module, create a Forwarding layer.
2. Set the Destination to be the URL of the OCS.
Set the Action to forward to the forwarding host and configure parameters to control forwarding behavior.

Chapter 10: Managing Shell Proxies

Shell proxies are those that provide a shell allowing a client to connect to the SG appliance. In this version, only a Telnet shell proxy is supported.

Using a shell proxy, you can:

- ❑ terminate a Telnet protocol connection either transparently or explicitly.
- ❑ authenticate users either transparently or explicitly.
- ❑ view the access log.
- ❑ enforce policies specified by CPL.
- ❑ communicate through an upstream SOCKS gateway and HTTP proxy using the CONNECT method.

Within the shell, you can configure the prompt and various banners using CPL substitutions. You can also use hard-coded text instead of CPL substitutions (available substitutions are listed in the table below). The syntax for a CPL substitution is:

`$(CPL_property)`

Table 10-1. CPL Substitutions for Shell Proxies

Substitution	Description
proxy.name or appliance.name	Configured name of the SG appliance.
proxy.address	IP address of the appliance on which this connection is accepted.
proxy.card	Adapter number of the appliance on which this connection is accepted.
client.protocol	This is "telnet".
client.address	IP address of the client.
proxy.primary_address or appliance.primary_address	Primary address of the proxy, not where the user is connected.
release.id	SGOS version.

Customizing Policy Settings for Shell Proxies

To manage a shell proxy through policy, you can use the conditions, properties, and actions listed below. For information on using CPL to manage shell proxies, refer to *Volume 11: Blue Coat SG Appliance Content Policy Language Guide*.

Conditions

- All time and date related triggers
- proxy.address=

- All exception related triggers
- All server_url triggers
- All url triggers
- All authentication related triggers
- category=
- client.address=
- proxy.card=
- proxy.port=
- client.protocol=
- user-defined conditions
- client.protocol=telnet
- url.scheme=telnet

Properties

- allow, deny, force_deny
- action.action_name{yes | no}
- All trace() properties
- All access_log() properties
- All log.xxx() properties
- access_server(yes | no)
- authenticate.force(yes | no)
- authenticate(realm)
- exception(exception_id[, details])
- force_exception(exception_id[, details])
- forward(alias_list | no)
- forward.fail_open(yes | no)
- reflect_ip(auto | no | client | vip | ip-address)
- socks_gateway(alias_list | no)
- socks_gateway.fail_open(yes | no)
- telnet.prompt(no | string)
- telnet.realm_banner(no | string)
- telnet.welcome_banner(no | string)

The banner strings support \$-sign substitutions.

Actions

- rewrite(url.host, host_regex_pattern, replacement_pattern)
- rewrite(url, url_regex_pattern, replacement_pattern)
- set(url_port, port_number)
- log_message()
- notify_email(subject, body)
- notify_snmp(message)

Boundary Conditions for Shell Proxies

- A hardcoded timeout of five minutes is enforced from the acceptance of a new connection until destination information is provided using the Telnet command.
- If proxy authentication is enabled, users have three chances to provide correct credentials.
- Users are not authenticated until destination information is provided.
- Users can only enter up to an accumulated 2048 characters while providing the destination information. (Previous attempts count against the total number of characters.)
- Connection to an upstream HTTP proxy is not encouraged.

- If connections from untrustworthy IP address or subnet are not desired, then a client IP/subnet-based *deny* policy must be written.

Understanding Telnet Shell Proxies

The Telnet shell proxy allows you to manage a Telnet protocol connection to the SG appliance. Using the Telnet shell proxy, you can do:

- Explicit termination without proxy authentication, where you explicitly connect, through Telnet, to the SG hostname or IP address. In this case, the SG appliance provides a shell.
- Explicit termination with proxy authentication, where after obtaining the destination host and port information from user, the SG appliance challenges for proxy credentials. Once the correct proxy credentials are provided and authenticated, the appliance makes an upstream connection and goes into tunnel mode. In this case, the appliance provides a shell.
- Transparent termination without proxy authentication, where the SG appliance intercepts Telnet traffic through an L4 switch, software bridge, or any other transparent redirection mechanism. From the destination address of TCP socket, the SG appliance obtains OCS contact information and makes the appropriate upstream connection, either directly or through any configured proxy. For more information on configuring a transparent proxy, see [Appendix B: "Explicit and Transparent Proxy" on page 175](#).
- Transparent termination with proxy authentication, where, after intercepting the transparent connection, the SG appliance challenges for proxy credentials. Once the correct proxy credentials are provided and authenticated, the SG appliance makes an upstream connection and goes into tunnel mode.

Once in the shell, the following commands are available:

- `help`: Displays available commands and their effects.
- `telnet <server[:port]>`: Makes an outgoing Telnet connection to specified server. The colon (:) between server and port can be replaced with a space, if preferred.
- `exit`: Terminates the shell session.

Creating a Telnet Shell Proxy Service

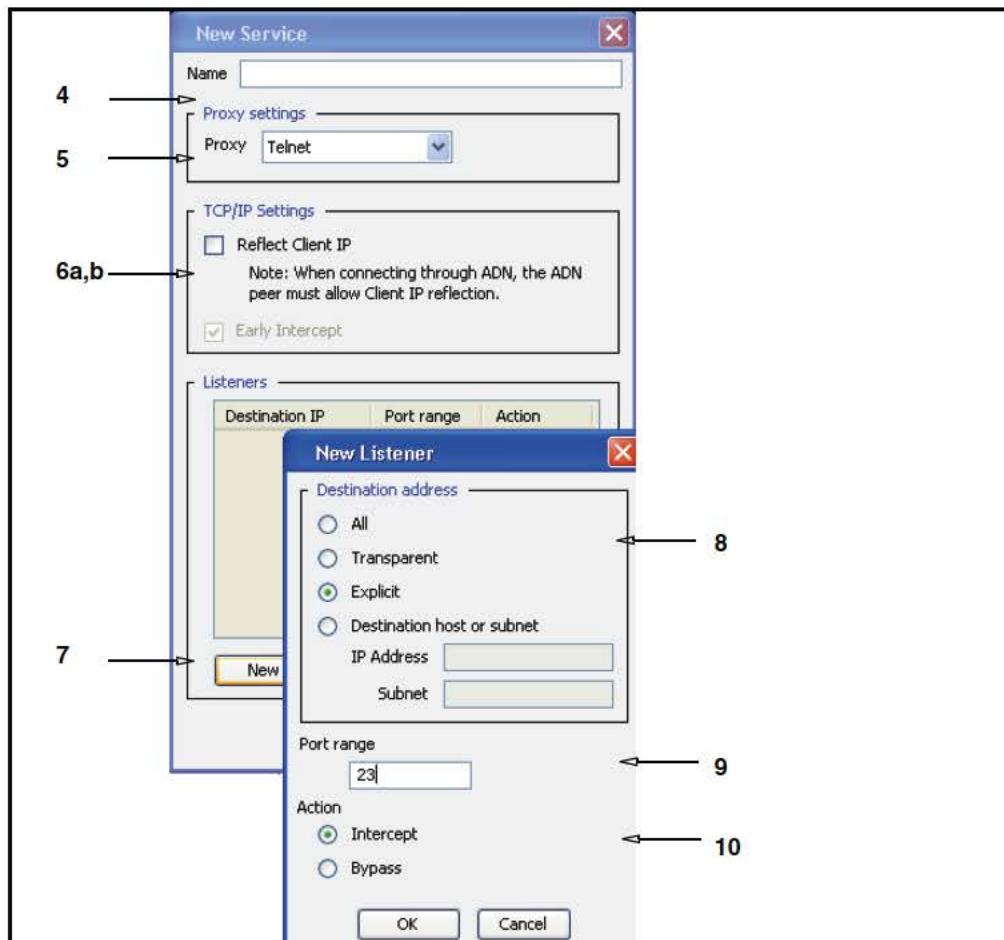
On a new system, Telnet proxy service is configured but disabled on port 23. On an upgrade, a Telnet proxy service is not created.

Note: To use Telnet to manage the SG appliance, create a Telnet-Console rather than a Telnet service. The Telnet service allows you to use Telnet for outbound connections, and the appliance functions as Shell proxy in that situation. For more information on the Telnet-Console, see "[Notes on Managing the Telnet Console](#)" on page 21.

To edit or create a Telnet proxy service:

1. Select **Configuration > Services > Proxy Services**.
2. To edit a specific proxy service, highlight the service and click **Edit**.
3. To create a new proxy service, click **New**.

Note: If you only want to change the proxy's behavior from bypass (the default) to intercept, go to the **Action** column of the **Proxy Services** pane, select the service whose behavior you want to change, and select **Intercept** from the drop-down list. You do not need to enter **New/Edit** mode to change this attribute.



4. In the **Name** field, choose a meaningful name for the new proxy service.
5. In the **Proxy settings** field, select Telnet.
6. Select or de-select the checkboxes, as appropriate, for the environment.
 - a. **Reflect Client IP**: Enables or disables sending of client's IP address instead of the SG appliance's IP address.
 - b. **Early Intercept**: This option cannot be changed when creating or editing an Telnet proxy service.
7. To create a new listener, click **New**.
8. Select a Destination IP address from the radio buttons.
9. In the **Port Range** field, enter the ports on which the service should listen. The default port is 23.
10. Select the default action for the service: **Bypass** tells the service to ignore any traffic. **Intercept** configures the service to intercept the traffic that is being proxied.

11. Click **OK**.

Relevant CLI Syntax to Create/Edit a Telnet Proxy Service:

- To enter configuration mode:

```
SGOS#(config) proxy-services
SGOS#(config proxy-services) create telnet service-name
SGOS#(config proxy-services) edit service-name
```

- The following subcommands are available:

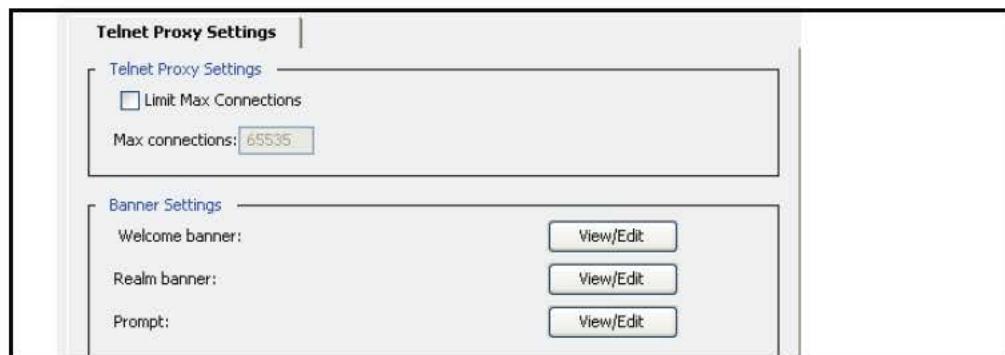
```
SGOS#(config service-name) add {transparent | explicit | all |
ip_address | ip_address/subnet-mask} {port | first_port-last_port}
[intercept | bypass]
SGOS#(config service-name) attribute reflect-client-ip {enable |
disable}
SGOS#(config service-name) bypass {transparent | explicit | all |
ip_address | ip_address/subnet-mask} {port | first_port-last_port}
SGOS#(config service-name) exit
SGOS#(config service-name) intercept {transparent | explicit | all |
ip_address | ip_address/subnet-mask} {port | first_port-last_port}
SGOS#(config service-name) remove {transparent | explicit | all |
ip_address | ip_address/subnet-mask} {port | first_port-last_port}
SGOS#(config service-name) view
```

Customizing Welcome and Realm Banners and Prompt Settings

You can configure banners for the Telnet shell and the realm and set the prompt that users see when entering the shell.

To customize Telnet shell proxy settings:

1. Select Configuration > Proxy Settings > Shell Proxies > Telnet Proxy Settings.



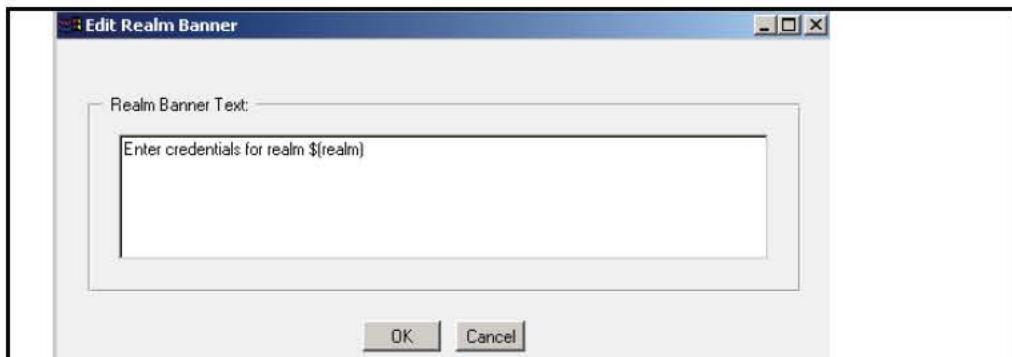
2. To set the maximum concurrent connections, select **Limit Max Connections**. Enter the number of maximum concurrent connections allowed for this service. Allowed values are between 1 and 65535.

3. Set the banner settings:

- a. To set the Welcome banner message (users see this when they enter the shell), click **View/Edit** next to the Welcome Banner. The Edit Welcome Banner dialog displays. (If you do not want this banner displayed, remove the text.)

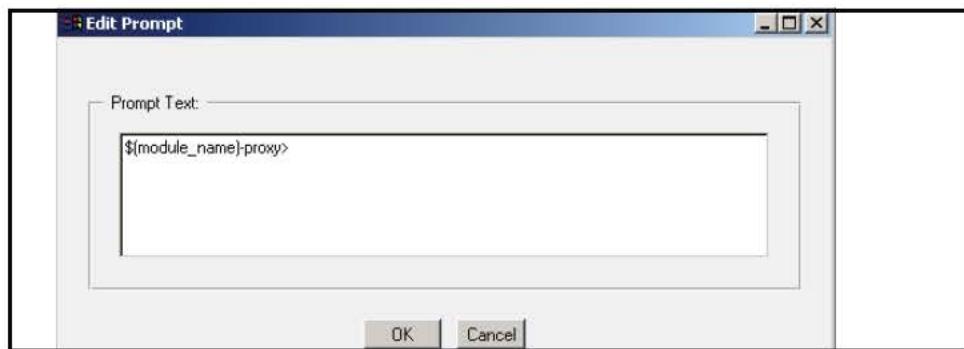


- b. Change the banner as necessary. The `$(client.protocol)` text is a CPL variable indicating that Telnet is the protocol. You do not have to use a variable. When finished, click **OK**.
4. Select **Apply** to commit the changes to the SG appliance.
5. To set the realms banner message (users see this help message just before they see the **Username** prompt for proxy authentication), click **View/Edit** next to the Realms Banner. The Edit Realms Banner dialog displays. (If you do not want this banner displayed, remove the text.)



- a. Change the banner as necessary. The `$(realm)` text is a CPL variable indicating the name of the realm. You do not have to use a variable. When finished, click **OK**.
6. Select **Apply** to commit the changes to the SG appliance.

- a. To set the prompt, click **View/Edit** next to the Prompt line.



7. Change the banner as necessary. The default is `$(client-protocol) >`, where `$(client-protocol)` is Telnet. You do not have to use a variable. (For a list of available substitutions, see "Table 10-1. CPL Substitutions for Shell Proxies" on page 121.) When finished, click **OK**.
8. Select **Apply** to commit the changes to the SG appliance.

Related CPL Syntax to Customize Telnet Shell Proxy Settings

You can use CPL substitutions when creating welcome and realm banners and Telnet prompts. For a list of available CPL substitutions, see "Table 10-1. CPL Substitutions for Shell Proxies" on page 121.

Related CLI Syntax to Configure a Telnet Shell Proxy

```
SGOS#(config) shell {max-connections number_of_connections | prompt
prompt | realm-banner realm_banner | welcome-banner welcome_banner}
```

Notes for Telnet Shell Proxies

- Telnet credential exchange is in plaintext.
- A Telnet proxy cannot be used to communicate with non-Telnet servers (such as Webservers on port 80) because Telnet proxies negotiate Telnet options with the client before a server connection can be established.

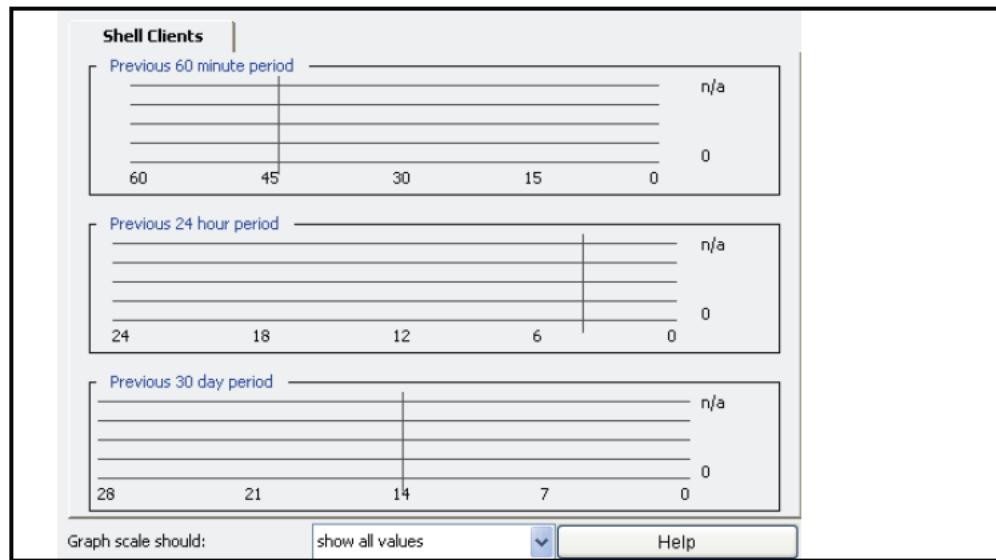
Shell History Statistics

The Shell History tab displays client connections over the last 60-minute, 24-hour, and 30-day period.

Note: The Shell history statistics are available only through the Management Console.

To view Shell history statistics:

1. Select **Statistics > Protocol Details > Shell History**.



2. (Optional) To set the graph scale to a different value, select a value from the **Graph scale should** drop-down list.

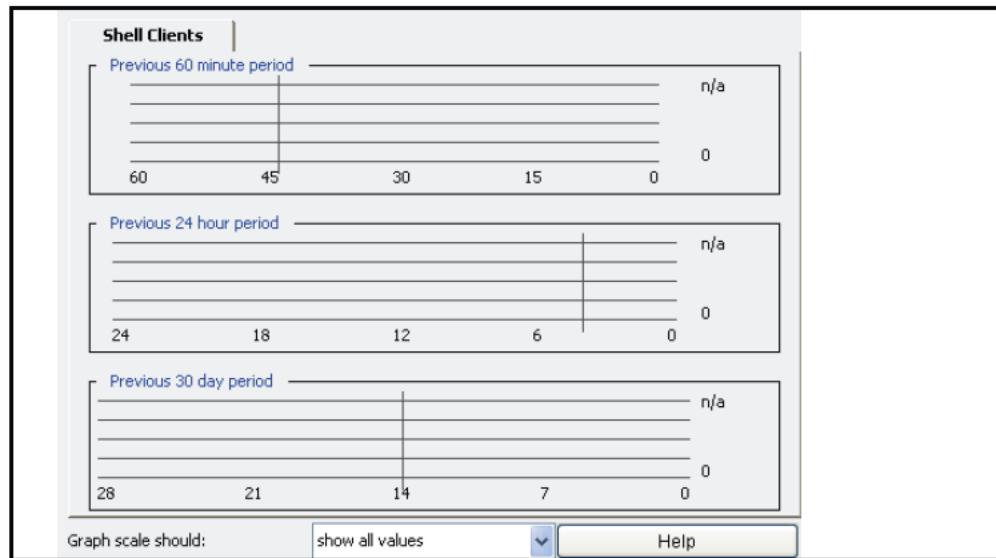
Viewing Shell History Statistics

The Shell History tab displays client connections over the last 60-minute, 24-hour, and 30-day period.

Note: The Shell history statistics are available only through the Management Console.

To view Shell history statistics:

1. Select **Statistics > Protocol Details > Shell History**.



2. (Optional) To set the graph scale to a different value, select a value from the **Graph scale should** drop-down list.

Chapter 11: Managing a SOCKS Proxy

While SOCKS servers are generally used to provide firewall protection to an enterprise, they also can be used to provide a generic way to proxy any TCP/IP or UDP protocols. The SG appliance supports both SOCKSv4/4a and SOCKSv5; however, because of increased username and password authentication capabilities and compression support, Blue Coat recommends that you use SOCKS v5.

Note: For Blue Coat compatibility with SOCKS clients, check with customer support.

In a typical deployment, the SOCKS proxy works with the Endpoint Mapper proxy and MAPI handoff. In this deployment, you will:

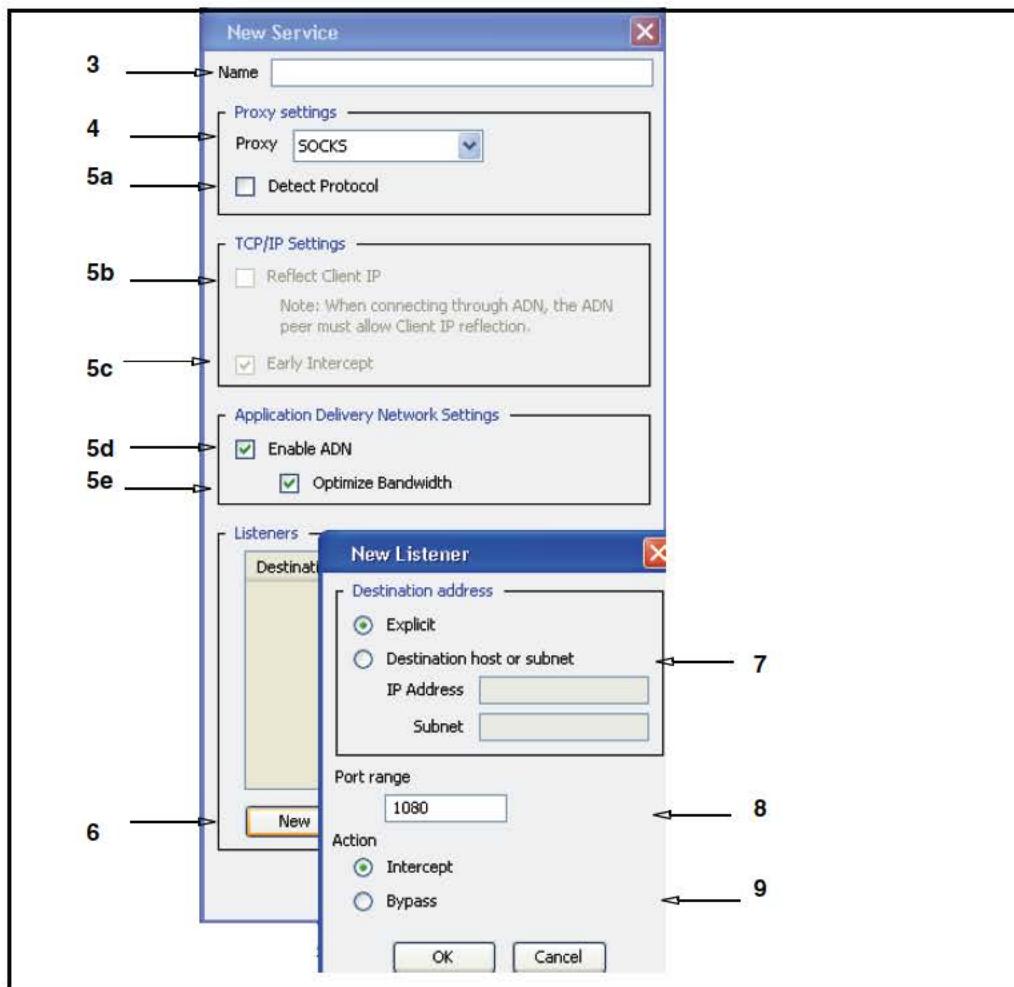
- Create an Endpoint Mapper proxy at the remote office (the downstream proxy) that intercepts Microsoft RPC traffic and creates dynamic TCP tunnels. Traffic to port 135 is transparently redirected to this service using bridging or L4 switch or WCCP. For information on creating and enabling an Endpoint Mapper proxy service, see “[Chapter 6: Managing the Endpoint Mapper and MAPI Proxies](#)” on page 55.
- Create any other TCP tunnel proxies you need at the remote office: SMTP, DNS, and the like. For information on configuring TCP tunnels, see “[Chapter 13: Managing the TCP Tunneling Proxy](#)” on page 163.
- Create a SOCKS gateway at the remote office. This SOCKS gateway points to a SOCKS proxy located at the main office location (the upstream proxy, the core of the network). For information on creating a SOCKS gateway, refer to *Volume 6: Advanced Networking*
- Set policy to forward TCP traffic through that SOCKS gateway. You can do this through the <proxy> layer using either the VPM or CPL. For more information, see “[Using Policy to Control the SOCKS Proxy](#)” on page 132.

Creating or Editing a SOCKS Proxy Service

To create or edit a SOCKS proxy service:

1. Select **Configuration > Services > Proxy Services**.
2. To edit an existing SOCKS proxy service, highlight the service and click **Edit**. To create a new proxy service, click **New**.

Note: If you only want to change the proxy's behavior from bypass (the default) to intercept, go to the **Action** column of the **Proxy Services** pane, select the service whose behavior you want to change, and select **Intercept** from the drop-down list. You do not need to enter **New/Edit** mode to change this attribute.



3. If you are creating a new SOCKS proxy service, enter a meaningful name in the **Name** field.
4. In the **Proxy settings** field, select SOCKS from the drop-down menu.
5. Select or de-select the checkboxes, as appropriate, for the service being set up. The **Early Intercept** checkbox cannot be selected.

- a. Select the **Detect Protocol** checkbox to automatically detect the protocol being used. Note that this breaks connections that do not have the client send information first, but expect the server to respond on connection. It also can add significant delay if the client does not send specific information, and only after timing out does it treat the traffic as unknown.
 - b. **Reflect Client IP:** This option cannot be changed when creating or editing an SOCKS proxy service.
 - c. **Early intercept:** This option cannot be changed when creating or editing an SOCKS proxy service.
 - d. **Enable ADN.** Select this checkbox if you want this service to use ADN. Note that enabling ADN does not guarantee the connections are accelerated by ADN. The actual enable decision is determined by ADN routing (for explicit deployment) and network setup (for transparent deployment).
 - e. The **Optimize Bandwidth** checkbox is selected by default if you enabled WAN optimization during initial configuration. You should de-select the checkbox if you are not configuring a WAN optimization network.
6. To create a new listener, click **New**; if you edit an existing listener, click **Edit**.
 7. Select a Destination IP address from the drop-down menu. The default is <All>.
 8. In the **Port Range** field, enter the ports on which the service should listen. The default port for the SOCKS proxy is 1080.
 9. Select the default behavior for the service: **Bypass** tells the service to ignore any traffic. **Intercept** configures the service to intercept the traffic that is being proxied.
 10. Click **OK**.

Relevant CLI Syntax to Create/Edit a Proxy Service:

- To enter configuration mode for the service:

```
SGOS#(config) proxy-services
SGOS#(config proxy-services) create socks service-name
SGOS#(config proxy-services) edit service-name
```

- The following subcommands are available:

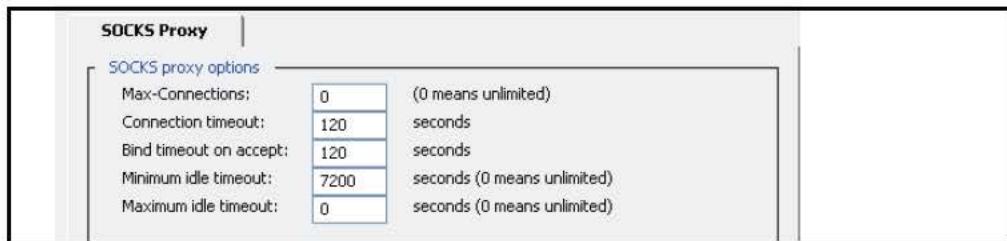
```
SGOS#(config service-name) add {explicit | ip_address | ip_address/
subnet-mask} {port | first_port-last_port} [intercept | bypass]
SGOS#(config service-name) attribute {adn-optimize {enable | disable} |
detect-protocol {enable | disable} | use-adn {enable | disable}}
SGOS#(config service-name) bypass {explicit | ip_address | ip_address/
subnet-mask} {port | first_port-last_port}
SGOS#(config service-name) intercept {explicit | ip_address |
ip_address/subnet-mask} {port | first_port-last_port}
SGOS#(config service-name) remove {explicit | ip_address | ip_address/
subnet-mask} {port | first_port-last_port}
SGOS#(config service-name) view
```

Configuring the SOCKS Proxy

Complete the following steps to create a SOCKS proxy and to configure SOCKS-proxy connection and timeout values.

To create a SOCKS proxy server:

1. Select **Configuration > Proxy Settings > SOCKS Proxy**.



- Fill in the option fields (described below) as needed. The defaults are displayed and should be sufficient for most purposes.

Table 11-1. SOCKS Proxy Options

Option	Suboption	Description
Max-Connections	<i>connections</i>	Set maximum allowed SOCKS client connections. The default of 0 indicates an infinite number of connections are allowed.
Connection timeout	<i>seconds</i>	Set maximum time to wait on an outbound CONNECT.
Bind timeout on accept	<i>seconds</i>	Set maximum time to wait on an inbound BIND.
Minimum idle timeout	<i>seconds</i>	Specifies the minimum timeout after which SOCKS can consider the connection for termination when the max connections are reached.
Maximum idle timeout	<i>seconds</i>	Specifies the max idle timeout value after which SOCKS should terminate the connection.

Related CLI Syntax to Configure the SOCKS Proxy

```
SGOS#(config) socks-proxy accept-timeout seconds
SGOS#(config) socks-proxy connect-timeout seconds
SGOS#(config) socks-proxy max-connections num_connections
SGOS#(config) socks-proxy max-idle-timeout seconds
SGOS#(config) socks-proxy min-idle-timeout seconds
```

Using Policy to Control the SOCKS Proxy

Once the basic configuration for the SOCKS proxy has been set, you can use policy to control the SOCKS proxy.

- To use SOCKS version 5, which allows you to use a SOCKS username/password, you must set the version through policy.
 - If using VPM, go to the Forwarding layer, select **Source > Set Source Object > New > SOCKS Version**.
 - If using CPL, enter the following:
`<proxy> client.protocol=socks
 ALLOW socks.version=5
 DENY`

Viewing SOCKS History Statistics

The SOCKS History tabs (SOCKS Clients, SOCKS Connections, and SOCKS client and server compression) display client data, Connect, Bind, and UDP Associate requests, client and server UDP, TCP and compression requests.

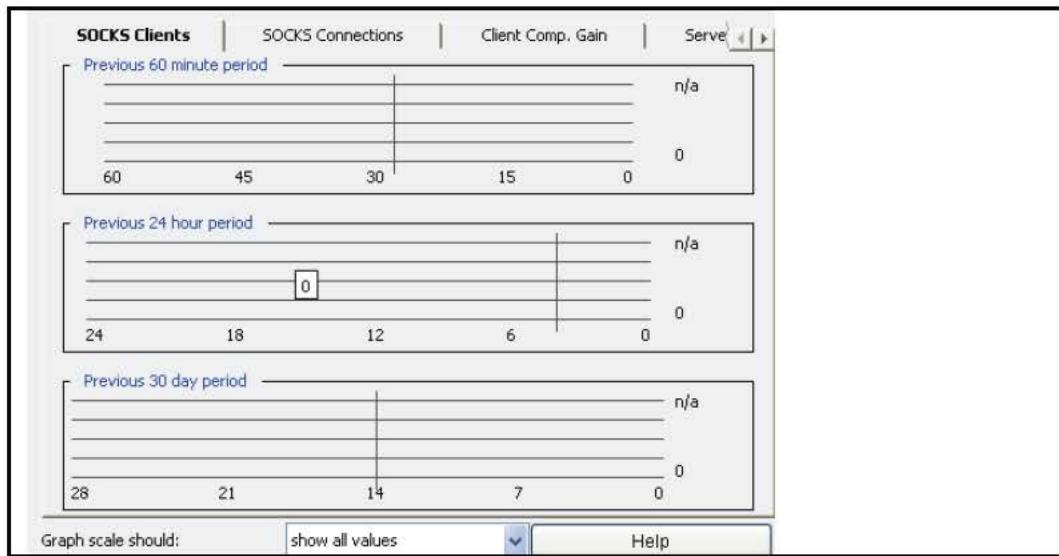
Note: The SOCKS history statistics are available only through the Management Console.

Viewing SOCKS Clients

The SOCKS Clients tab displays SOCKS Client data.

To view SOCKS client data:

Select Statistics > Protocol Details > SOCKS History > SOCKS Clients.

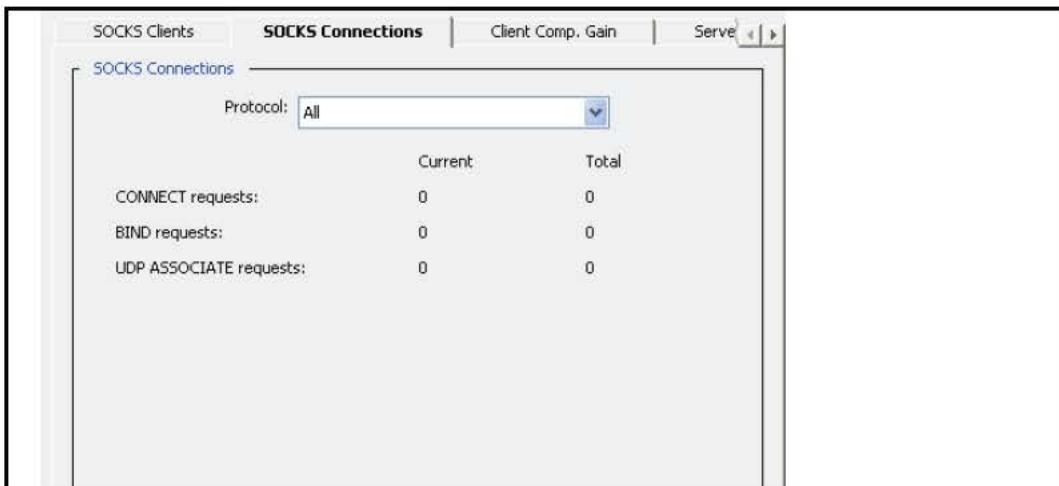


Viewing SOCKS Connections

The SOCKS Connections tab displays SOCKS Connection data.

To view SOCKS connection data:

Select Statistics > SOCKS History > SOCKS Connections.



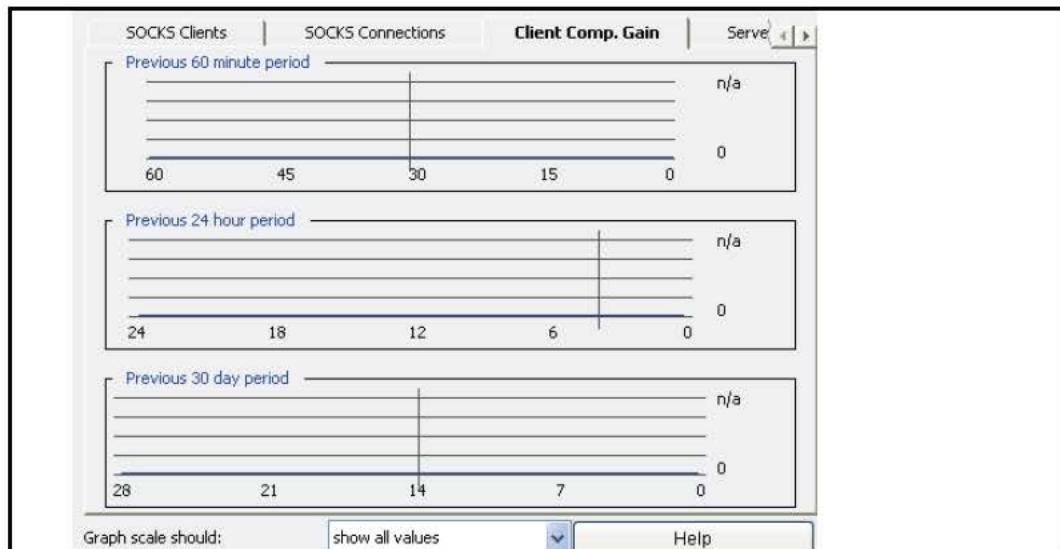
Viewing SOCKS Client and Server Compression Gain Statistics

Under SOCKS History, you can view SOCKS client and server compression-gain statistics for the SG appliance over the last 60 minutes, 24 hours, and 30 days in the Client Comp. Gain and the Server Comp. Gain tabs. These statistics are not available through the CLI.

The green display on the bar graph represents uncompressed data; the blue display represents compressed data. Hover your cursor over the graph to see the compressed gain data.

To view SOCKS client compressed gain statistics:

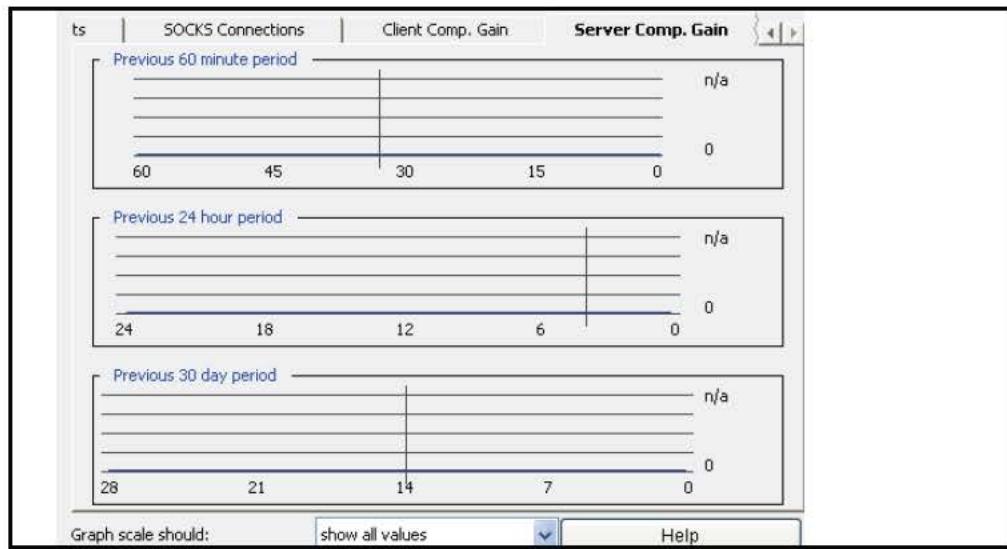
1. Select **Statistics > Protocol Details > SOCKS History > Client Comp. Gain**.



2. (Optional) To set the graph scale to a different value, select a value from the **Graph scale should** drop-down list.

To view SOCKS Server compressed gain statistics:

1. Select **Statistics > Protocol Details > SOCKS History > Server Comp. Gain**.



2. (Optional) To set the graph scale to a different value, select a value from the **Graph scale should** drop-down list.

Chapter 12: Managing the SSL Proxy

HTTPS traffic poses a major security risk to enterprises. Because the SSL content is encrypted, it can't be monitored by normal means, allowing users to bring in viruses, access forbidden sites, or leak business confidential information over the HTTPS connection on port 443.

The SSL proxy allows you to intercept HTTPS traffic (in explicit and transparent modes) so that security measures such as authentication, virus scanning and URL filtering, and performance enhancements such as HTTP caching can be applied to HTTPS content. Additionally, the SSL proxy allows you to validate server certificates presented by various HTTPS sites at the gateway and offers information about the HTTPS traffic in the access log.

Understanding the SSL Proxy

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 for monitoring reasons as well.

Note: 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).

Validating the Server Certificate

The SSL Proxy can do the following checks on server certificates:

- Verification of issuer signature.
- Verification of certificate dates.
- Comparison of hostname in the URL and certificate (intercepted connections only).

Hostnames in server certificates are important because the SSL Proxy can identify a Web site just by looking at the server certificate if the hostname is in the certificate. Most content-filtering HTTPS sites follow the guideline of putting the name of the site as the common name in the server's certificate.

- Verification of revocation status.

To mimic the overrides supported by browsers, the SSL Proxy can be configured to ignore failures for the verification of issuer signatures and certificate dates and comparision of the hostname in the URL and the certificate.

The SG appliance trusts all root CA certificates that are trusted by Internet Explorer and Firefox. This list is updated to be in sync with the latest versions of IE and Firefox.

Checking CRLs

An additional check on the server certificate is done through Certificate Revocations Lists (CRLs). CRLs are lists that show which certificates are no longer valid; the CRLs are created and maintained by Certificate Signing Authorities that issued the original certificates.

Only CRLs that are issued by a trusted issuer can be used by the ProxySG. The CRL issuer certificate must exist as CA certificate on the ProxySG before the CRL can be imported.

The ProxySG allows:

- One local CRL per certificate issuing authority.
- An import of a CRL that is expired; a warning is displayed in the log.
- An import of a CRL that is effective in the future; a warning is displayed in the log.

Determining What HTTPS Traffic to Intercept

The SSL proxy tunnels HTTPS traffic by default; it does not intercept HTTPS traffic.

Many existing policy conditions, such as destination IP address and port number can be used to decide which HTTPS connections to intercept.

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.

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 interception. You can use consent certificates to obtain consent prior to interception. The HTML Notify User is easier; however, note that the ProxySG has to decrypt the first request from the user before it can issue an HTML notification page.

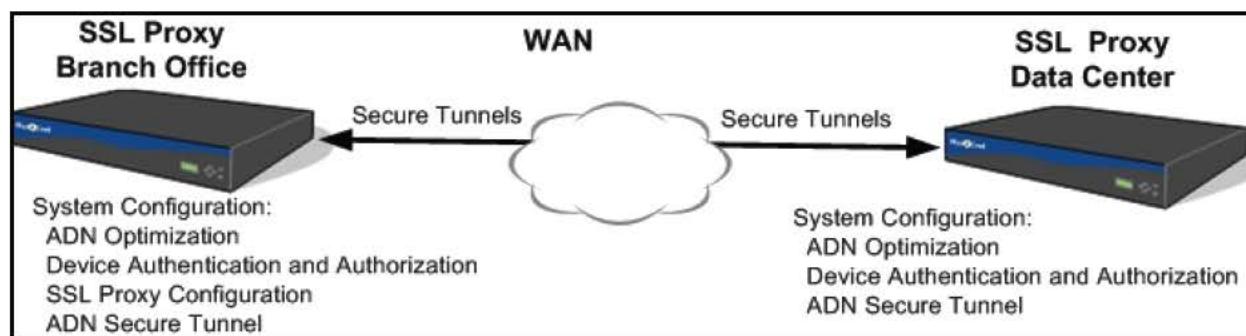
Using the SSL Proxy with ADN Optimization

The SSL proxy itself can be used as a split proxy, which requires two SSL proxies, one at the branch and one at the core, working together. A *split proxy* can implement functionality that is not possible in a standalone proxy.

In this configuration, the SSL proxy supports ADN optimization on WAN networks, and SSL traffic performance can be increased through the byte caching capability offered. The branch proxy is configured with both ADN optimization and SSL proxy functionality.

The concentrator proxy does not require any configuration related to SSL Proxy. It only requires the necessary ADN configuration for applying byte caching capabilities to intercepted SSL content.

No special configuration is done to the SSL proxy. Securing the tunnels and authenticating the devices is done from the **Configuration > App. Delivery Network** panes.



Section A: Intercepting HTTPS Traffic

Intercepting HTTPS traffic (by decrypting SSL connections at the SG appliance) allows you to apply security measures like virus scanning and URL filtering.

Configuration to intercept HTTPS traffic requires the following steps:

- ❑ Determine whether you are using transparent or explicit mode. For information on explicit versus transparent proxies, see “[Explicit and Transparent Proxy](#)” on page 175.
- ❑ Create an SSL service or HTTP/SOCKS services with protocol detection enabled., depending on whether you are using transparent or explicit mode. For more information on creating an SSL service, skip to “[Setting Up the SSL Proxy in Transparent Proxy Mode](#)” on page 140.
- ❑ Create or import an issuer keyring, which is used to sign emulated server certificates to clients on the fly, allowing the SSL proxy to examine SSL content. For more information on creating an issuer keyring, see “[Creating an Issuer Keyring for SSL Interception](#)” on page 143.
- ❑ (Optional) Use the **Notify User** object or client consent certificates to notify users that their requests are being intercepted and monitored. Whether this is required depends on local privacy laws. Note that the SG appliance has to decrypt the first request from the user to issue an HTML notification page. If this is not desirable, use client consent certificates instead. For more information on configuring the Notify User object, refer to *Volume 7: VPM and Advanced Policy*. For information on managing client consent certificates, see “[Using Client Consent Certificates](#)” on page 143.
- ❑ Download CA certificates to desktops to avoid a security warning from the client browsers when the SG appliance is intercepting HTTPS traffic. For information, see “[Downloading an Issuer Certificate](#)” on page 144.
- ❑ Using policy (VPM or CPL), create rules to intercept SSL traffic and to control validation of server certificates. By default, such traffic is tunneled and not intercepted. You must create suitable policy before intercepting SSL traffic. For more information on using policy to intercept SSL traffic, see “[Configuring SSL Rules through Policy](#)” on page 147.
- ❑ Configure the Blue Coat AV or other third-party ICAP vendor, if you have not already done this. For more information on ICAP-based virus scanning, refer to *Volume 8: Managing Content*.
- ❑ Configure the Blue Coat Web Filter (BCWF) or a third-party URL-filtering vendor, if you have not already done this. For more information on configuring BCWF, refer to *Volume 8: Managing Content*.
- ❑ Configure Access Logging. For more information on configuring access logging, refer to *Volume 9: Access Logging*.
- ❑ To customize exception pages (in case of server certificate verification failure), refer to *Volume 7: VPM and Advanced Policy*.

Setting Up the SSL Proxy in Transparent Proxy Mode

Proxy services are configured from the Management Console or the CLI. If using SSL proxy in transparent mode, continue with this section.

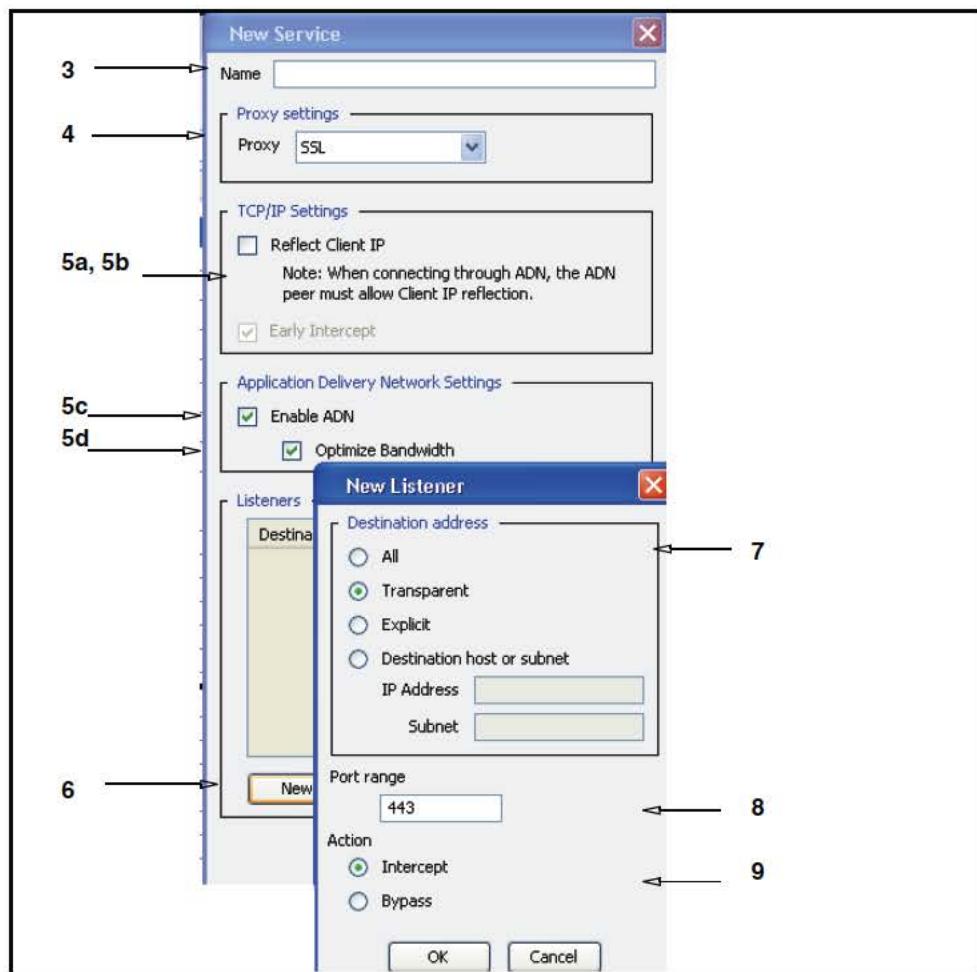
Section A: Intercepting HTTPS Traffic

If using SSL proxy in explicit mode, you might need an HTTP proxy or a SOCKS proxy. For information on configuring an SSL Proxy in explicit mode, see “[Setting Up the SSL Proxy in Explicit Proxy Mode](#)” on page 142.

You can use a TCP Tunnel service in transparent mode to get the same functionality. A TCP tunnel service is useful when you have a combination of SSL and non-SSL traffic going over port 443 and you do not want to break the non-SSL traffic. The SSL service requires that all requests to its port be SSL.

To configure an SSL service in transparent proxy mode:

1. From the Management Console, select Configuration > Services > Proxy Services.
2. Click New.



3. Give the SSL proxy a meaningful name.
4. Select the proxy type from the **Proxy settings** drop-down list.
5. Select or de-select the checkboxes, as appropriate, for the service being set up.

Section A: Intercepting HTTPS Traffic

- a. The **Early Intercept** checkbox cannot be changed for the SSL proxy service.
 - b. The **Reflect Client IP** checkbox enables or disables sending of client's IP address instead of the SG appliance's IP address. Note that this setting is overruled by policy.
 - c. **Enable ADN.** Select this checkbox if you want this service to use ADN. Note that enabling ADN does not guarantee the connections are accelerated by ADN. The actual enable decision is determined by ADN routing (for explicit deployment) and network setup (for transparent deployment).
 - d. The **Optimize Bandwidth** checkbox is selected by default if you enabled WAN optimization during initial configuration. You should de-select the checkbox if you are not configuring a WAN optimization network.
6. To create a new listener, click **New**; if you edit an existing listener, click **Edit**.
 7. Select a Destination IP address.
 8. In the **Port Range** field, enter the ports on which the service should listen. The default port for SSL is 443.
 9. Select the default behavior for the service: **Bypass** tells the service to ignore any traffic. **Intercept** configures the service to intercept the traffic that is being proxied.
 10. Click OK.

Continue with “[Creating an Issuer Keyring for SSL Interception](#)” on page 143.

Relevant CLI Syntax to Create/Edit an SSL Proxy Service:

- To enter configuration mode for the service:

```
SGOS#(config) proxy-services
SGOS#(config proxy-services) create service-type service-name
SGOS#(config proxy-services) edit service-name
```

- The following subcommands are available:

```
SGOS#(config service-name) add {transparent | ip_address | ip_address/
subnet-mask} {port | first_port-last_port} [intercept | bypass]
SGOS#(config service-name) attribute {adn-optimize {enable | disable}
| reflect-client-ip {enable | disable} | use-adn {enable | disable}}
SGOS#(config service-name) bypass {transparent | ip_address |
ip_address/subnet-mask} {port | first_port-last_port}
SGOS#(config service-name) exit
SGOS#(config service-name) intercept {transparent | ip_address |
ip_address/subnet-mask} {port | first_port-last_port}
SGOS#(config service-name) remove {transparent / ip_address |
ip_address/subnet-mask} {port | first_port-last_port}
SGOS#(config service-name) view
```

Setting Up the SSL Proxy in Explicit Proxy Mode

The SSL Proxy can be used in explicit mode in conjunction with the HTTP Proxy or SOCKS Proxy. You must create an HTTP Proxy service or a SOCKS Proxy service and use it as the explicit proxy from desktop browsers. You must also ensure that the detect-protocol attribute is enabled for these services.

Section A: Intercepting HTTPS Traffic

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.

For information on configuring a new explicit HTTP or SOCKS proxy service, see “[Creating an Explicit Proxy Server](#)” on page 176.

Continue with “[Creating an Issuer Keyring for SSL Interception](#)” on page 143.

Creating an Issuer Keyring for SSL Interception

The SSL proxy can emulate server certificates; that is, present a certificate that appears to come from the origin content server. In actuality, Blue Coat has emulated the certificate and signed it using the issuer keyring. By default only the subjectName and expiration from the server certificate is copied to the new certificate sent to the client.

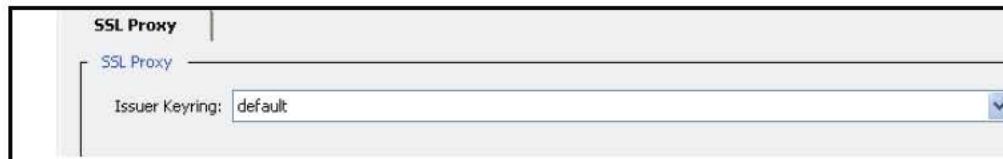
Note that only keyrings with both a certificate and a keypair can be used as issuer keyrings.

To specify the keyring:

If you prefer, you can specify the issuer keyring through VPM or CPL instead of creating it here.

Note: You can create a new keyring, import a keyring, or select among existing keyrings. For information on creating a keyring, refer to *Volume 5: Securing the Blue Coat SG Appliance*.

1. From the Management Console, select **Configuration > Proxy Settings > SSL Proxy**.



2. From the dropdown menu, select the keyring you want to use as the issuer keyring.
3. Click **Apply**.

To configure policy, see “[Configuring SSL Rules through Policy](#)” on page 147.

Related CLI Syntax to Specify the Keyring

```
SGOS#(config ssl) proxy issuer-keyring keyring_name
```

To configure policy, see “[Configuring SSL Rules through Policy](#)” on page 147.

Using Client Consent Certificates

The SSL Proxy, in forward proxy deployments, can specify whether a client (typically a browser) certificate is required. These certificates are used for user consent, not for user authentication. Whether they are needed depends upon local privacy laws.

With client consent certificates, each user is issued a pair of certificates with the corresponding private keys. Both certificates have a meaningful user-readable string in the common name field. One certificate has a string that indicates grant of consent

Section A: Intercepting HTTPS Traffic

something like: "Yes, I agree to SSL interception". The other certificate has a common name indicating denial of consent, something like: "No, I do not agree to SSL interception".

Policy is installed on the SG appliance to look for these common names and to allow or deny actions. For example, when the string "Yes, I agree to SSL interception" is seen in the client certificate common name, the connection is allowed; otherwise, it is denied.

To configure client consent certificates:

1. Install the issuer of the client consent certificates as a CA certificate.
2. In VPM, configure the **Require Client Certificate** object in the Action column of the SSL Layer.
3. Configure the **Client Certificate** object in the Source column to match common names.

Downloading an Issuer Certificate

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](#)" on page 144. To download a certificate through Firefox, see "[To download a certificate through Firefox](#)" on page 146.

To download a certificate through Internet Explorer:

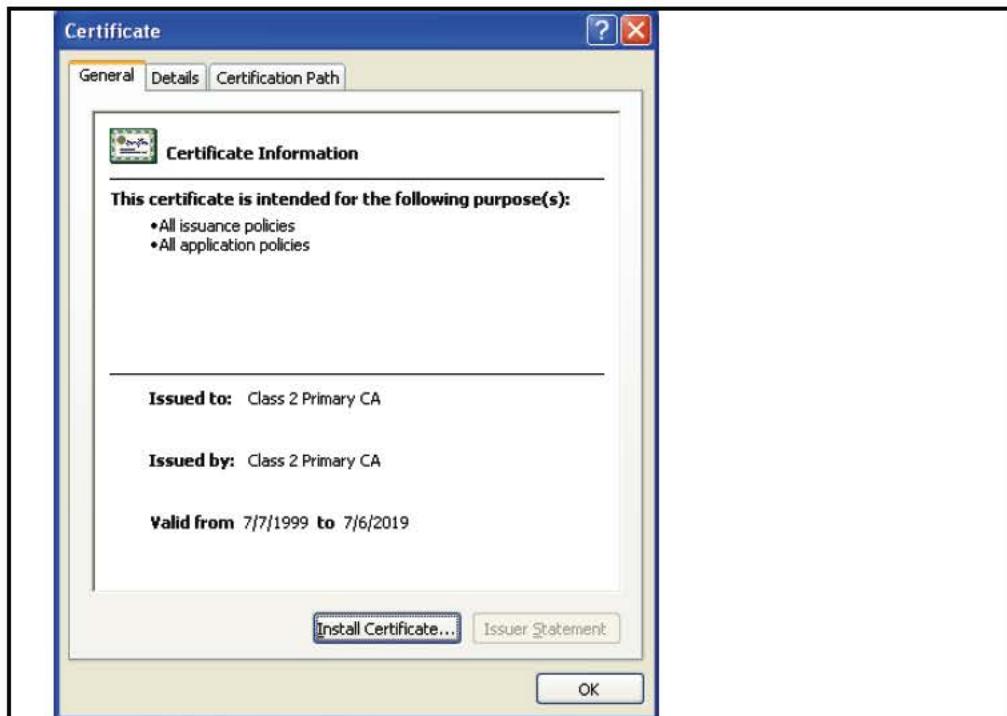
Note: You can e-mail the console URL corresponding to the issuer certificate to end users so that the end-user can install the issuer certificate as a trusted CA.

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.

Section A: Intercepting HTTPS Traffic



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.

Section A: Intercepting HTTPS Traffic

To download a certificate through Firefox:

Note: 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.

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 **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.

[Section B: Configuring SSL Rules through Policy](#)

Section B: Configuring SSL Rules through Policy

SSL interception and access rules, including server certificate validation, are configured through policy—either VPM or CPL. Note that VPM is much easier to use than CPL. Use the **SSL Intercept** Layer to configure SSL interception; use the SSL Access Layer to control other aspects of SSL communication such as server certificate validation and SSL versions. To configure SSL rules using CPL, skip to “[CPL in the SSL Intercept Layer](#)” on page 151.

This section covers the following topics:

- [□ “Using the SSL Intercept Layer” on page 147.](#)
- [□ “Using the SSL Access Layer” on page 149](#)
- [□ “Using Client Consent Certificates” on page 143](#)

Using the SSL Intercept Layer

The SSL intercept layer allows you to set intercept options:

- [□ “To intercept HTTPS content through VPM:” on page 147](#)
- [□ “To customize server certificate validation through VPM:” on page 150](#)

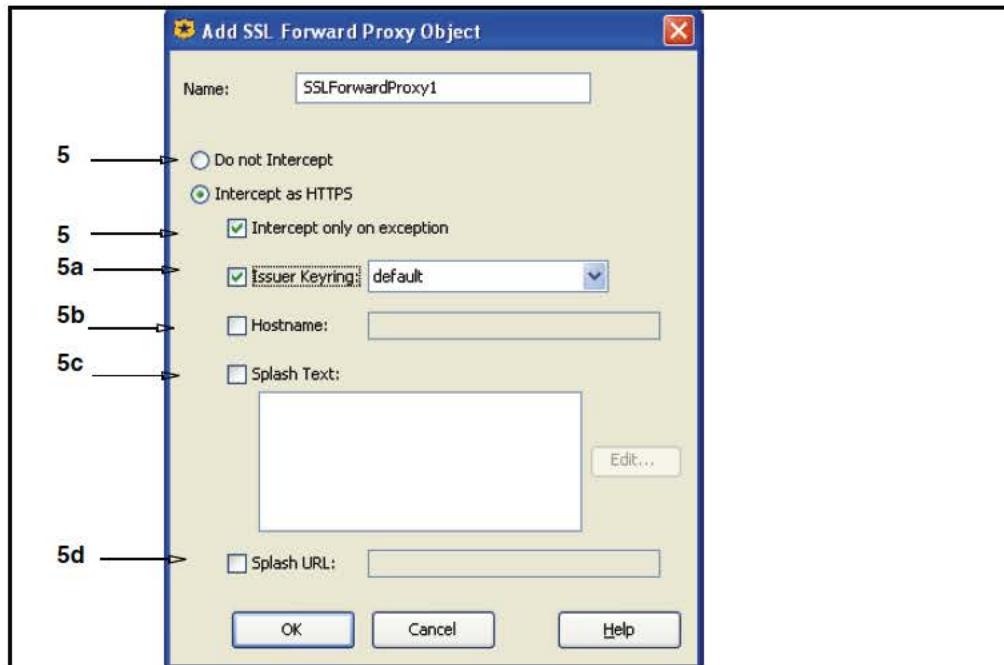
For a list of policy conditions, properties, and actions, see “[CPL in the SSL Intercept Layer](#)” on page 151.

Note: For detailed instructions on using VPM, refer to *Volume 7: VPM and Advanced Policy*.

To intercept HTTPS content through VPM:

1. Go to **Configuration > Policy > Visual Policy Manager** and launch VPM.
2. From the Policy drop-down menu, select **Add SSL Intercept Layer**.
3. Right-click **Set** in the Action column; the **Set Action** object displays.
4. Click **New** and select **Set SSL Forward Proxy** object.

Section B: Configuring SSL Rules through Policy



5. The default behavior is **Intercept only on exception**. When the SSL proxy intercepts HTTPS connections, it generates a private key and corresponding certificate dynamically. To change the default to **Do not Intercept**, select the **Do not Intercept** radio button.

The checkboxes for **Issuer Keyring**, **Hostname**, **Splash Text**, and **Splash URL** all control various aspects for certificate emulation. Fill in the fields as follows:

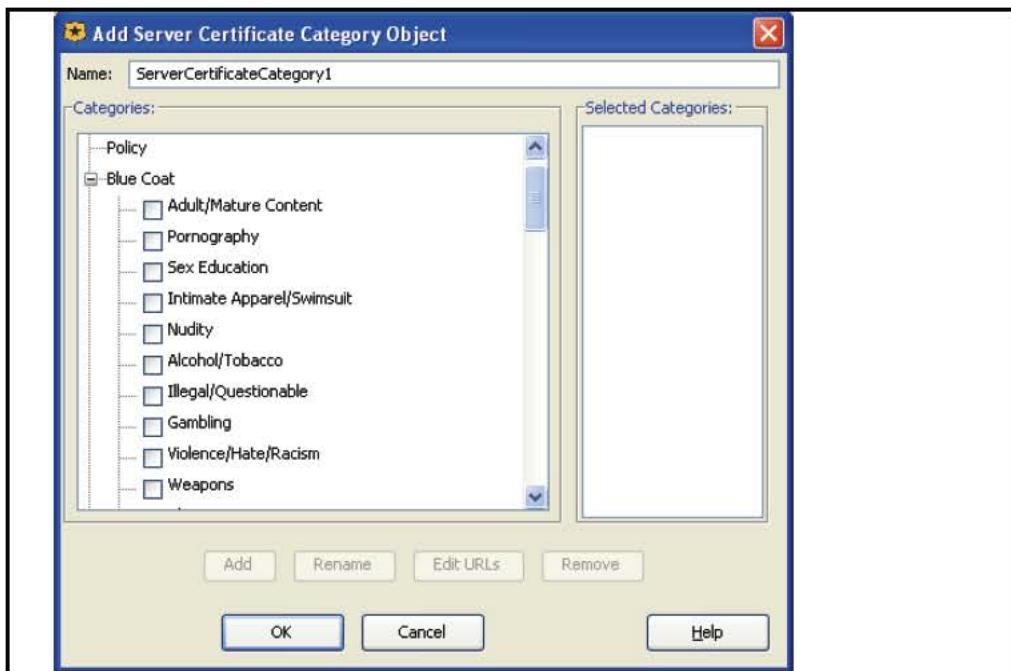
- Issuer Keyring:** If you selected an issuer keyring previously, that keyring displays. If you did not select an issuer keyring previously, the default keyring displays. To change the keyring that is used as the issuer keyring, choose a different keyring from the dropdown menu.
- Hostname:** The hostname you put here is the hostname in the emulated certificate.
- Splash Text:** You are limited to a maximum of 200 characters. The splash text is added to the emulated certificate as a certificate extension.
- Splash URL:** The splash URL is added to the emulated certificate as a certificate extension.

6. Click **OK** to save the changes.

To categorize hostnames in server certificates through VPM:

1. While still in the Destination column of the **SSL Intercept** layer, right-click **Set**; the Set Destination Object displays.
2. Click **New** and highlight **Server Certificate Category** object. The Server Certificate Category Object displays. You can change the name in the top field if needed.

Section B: Configuring SSL Rules through Policy



3. Highlight the categories and click **Add**.

The categories you selected display in the left-hand column.

4. Click **OK**.

Using the SSL Access Layer

The SSL Access layer allows you to set accessibility options:

- ❑ "To intercept HTTPS requests to specific sites through VPM:" on page 149
- ❑ "To customize server certificate validation through VPM:" on page 150

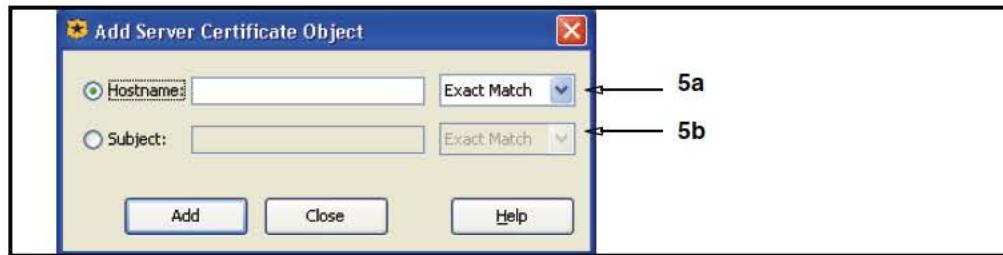
For a list of the conditions, properties, and actions that can be used in the SSL Access layer, see "CPL in the SSL Layer" on page 152.

Note: For detailed instructions on using VPM, refer to *Volume 7: VPM and Advanced Policy*.

To intercept HTTPS requests to specific sites through VPM:

1. Go to **Configuration > Policy > Visual Policy Manager** and launch VPM.
2. From the **Policy** drop-down menu, select **Add SSL Access Layer**.
3. In the **Action** column, right-click **Set**; the **Set Action** object displays.
4. Click **New** and select **Server Certificate**.

Section B: Configuring SSL Rules through Policy

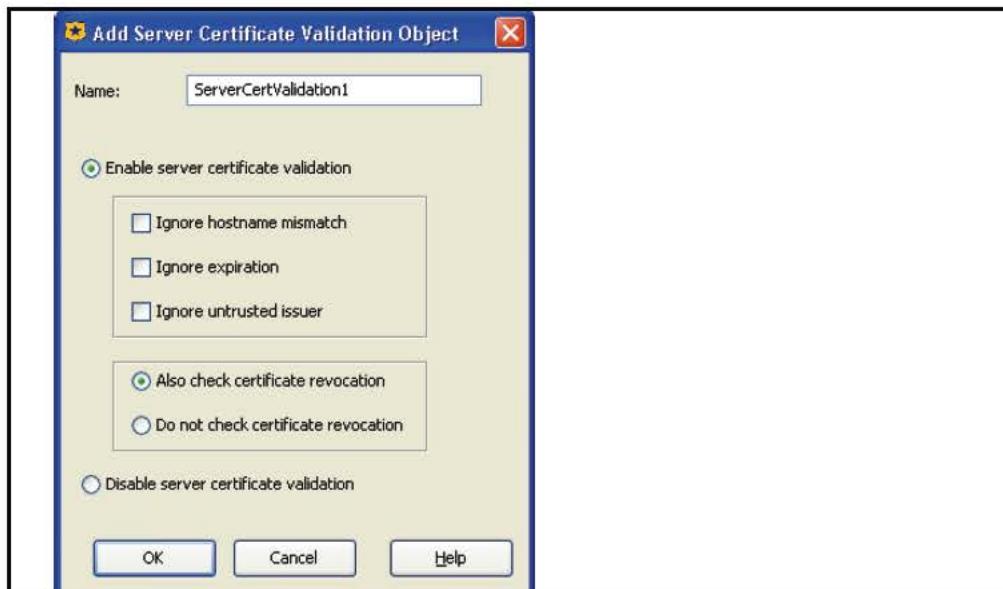


5. Fill in the fields as described below. Note that you can only choose one field:
 - a. **Hostname:** This is the hostname of the server whose traffic you want to intercept. After entering the hostname, use the drop-down menu to specify **Exact Match, Contains, At Beginning, At End, Domain, or Regex.**
 - b. **Subject:** This is the subject field in the server's certificate. After you enter the subject, use the drop-down menu to specify **Exact Match, Contains, At Beginning, At End, Domain, or Regex.**

To customize server certificate validation through VPM:

Note: The policy property `server.certificate.validate`, if set, overrides the `ssl-verify-server` command for either HTTP or for forwarding hosts.

1. Go to **Configuration > Policy > Visual Policy Manager** and launch VPM.
2. From the **Policy** drop-down menu, select **Add SSL Access Layer**.
3. In the **Action** column, right-click **Set**; the **Set Action** object displays.
4. Click **New** and select **Set Server Certificate Validation object**.



5. By default, server certificate validation is enabled; to disable it, select **Disable server certificate validation** at the bottom of the dialog.

Section B: Configuring SSL Rules through Policy

If server certificate validation is enabled, you can determine behavior by selecting checkboxes to **Ignore a hostname mismatch**, **Ignore certificate expiration**, or **Ignore untrusted issuer**. These overrides mimic the overrides supported by most browsers.

You can add server certificates to the SG appliance to allow proper validation. For more information, refer to *Volume 5: Securing the Blue Coat SG Appliance*.

6. If you want to check the CA certificate revocation list (CRL) from a Certificate Authority, verify **Also check certification revocation** is selected. For information on using CRL, see “[Checking CRLs](#)” on page 138.

CPL in the SSL Intercept Layer

Note: VPM is much easier to use than CPL. All CPL gestures except the `ssl.forward_proxy.server_keyring` property, used only for troubleshooting, are also in VPM.

The following CPL gestures can be used in the SSL Intercept layer:

Note: No authentication-related triggers are allowed in the SSL Intercept layer.

Allowed Properties (allowed in the SSL Intercept layer only):

- `ssl.forward_proxy()`
- `ssl.forward_proxy.hostname()`
- `ssl.forward_proxy.issuer_keyring()`
- `ssl.forward_proxy.server_keyring()`
- `ssl.forward_proxy.splash_url()`
- `ssl.forward_proxy.splash_text()`
- `trace.destination()`
- `trace.request()`
- `trace.rules()`
- `ssl.forward_proxy.server_keyring` (used for troubleshooting only)

Allowed Actions

- `log_message()`
- `notify_email()`
- `notify_snmp()`

Allowed Conditions

- `category`
- `client.address`
- `client.host`
- `client.host.has_name`
- `client.protocol`
- `proxy.address`
- `proxy.port`
- `server.certificate.hostname`
- `server.certificate.hostname.category`
- `server.certificate.subject`
- `server_url.*`
- `url.*`

Section B: Configuring SSL Rules through Policy

- proxy.card

An example of using CPL to intercept SSL traffic is:

```
;create list of servers to intercept
define condition server_intercept_list
    server.certificate.hostname.category=webmail
    server.certificate.hostname=porn.com
    server.certificate.hostname.category=gambling
    server.certificate.hostname.category=none
end condition server_intercept_list
<SSL-Intercept>
; value no means tunnel, value https means intercept as forward proxy
condition=server_intercept_list ssl.forward_proxy(https)
ssl.forward_proxy(no)
```

Note: For detailed instructions on using CPL, including detailed explanations of the gestures listed here, refer to *Volume 11: Blue Coat SG Appliance Content Policy Language Guide*

CPL in the SSL Layer

The following CPL gestures can be used in the SSL layer (called SSL Access layer in VPM):

Allowed Actions (allowed in the SSL layer only)

- | | | |
|---|--|---|
| • server.certificate.validate(yes no) | • server.certificate.validate.check_revocation(local no) | • server.certificate.validate.ignore(hostname_mismatch expiration untrusted_issuer) |
| • client.certificate.validate(yes no) | • client.certificate.validate.check_revocation(local no) | • client.certificate.require(yes) |

Allowed Conditions and Properties

- | | | |
|---|---|---|
| • client.connection.negotiated_ssl_version = (condition) | • client.certificate.common_name.regex = <regex> | • client.certificate.subject_dn = <X.500 DN> |
| • client.certificate.common_name[.exact .substring .prefix .suffix] = <string> | • client.certificate.subject[.exact .substring .prefix .suffix .regex] = <string> | • client.certificate.subject_regex = <regex> |
| • server.certificate.hostname[.exact .substring .prefix .suffix] = <string> | • server.certificate.hostname.regex = <regex> | • server.certificate.hostname.category = <category_list> |
| • server.certificate.hostname.category != <exclusion_category_list> (condition) | • server.connection.negotiated_cipher.strength = low medium high export | • server.connection.negotiated_cipher.strength = low medium high export |

Section B: Configuring SSL Rules through Policy

- ssl.proxy_mode=
- client.protocol=
- tunneled=

Note: For detailed instructions on using CPL, including detailed explanations of the gestures listed here, refer to *Volume 11: Blue Coat SG Appliance Content Policy Language Guide*.

Notes

Note: Pipelining configuration for HTTP is ignored for HTTPS requests intercepted by the SSL Proxy. When the SSL Proxy intercepts an HTTPS request, and the response is an HTML page with embedded images, the embedded images are not pre-fetched by the SG appliance.

- If the SG appliance and the origin content server cannot agree on a common cipher suite for intercepted connections, the connection is aborted.
- Server-Gated Cryptography and step-up certificates are treated just as regular certificates; special extensions present in these certificates are not copied into the emulated certificate. Clients relying on SGC/step-up certificates continue using weaker ciphers between the client and the SG appliance when the SSL Proxy intercepts the traffic.

Section C: Viewing SSL Statistics

Section C: Viewing SSL Statistics

SSL History Statistics

The SSL History tabs (Unintercepted SSL Data, Unintercepted SSL Clients, Unintercepted SSL Bytes) provide various useful statistics for unintercepted SSL traffic.

Note: Some SSL statistics (SSL client connections and total bytes sent and received over a period of time) can only be viewed through the Management Console (see "[Unintercepted SSL Data](#)" on page 154 and "[Unintercepted SSL Clients](#)" on page 155, below).

Unintercepted SSL Data

The Unintercepted SSL Data tab on the Management Console displays SSL statistics.

The following table details the statistics provided through the Management Console Unintercepted SSL Data tab.

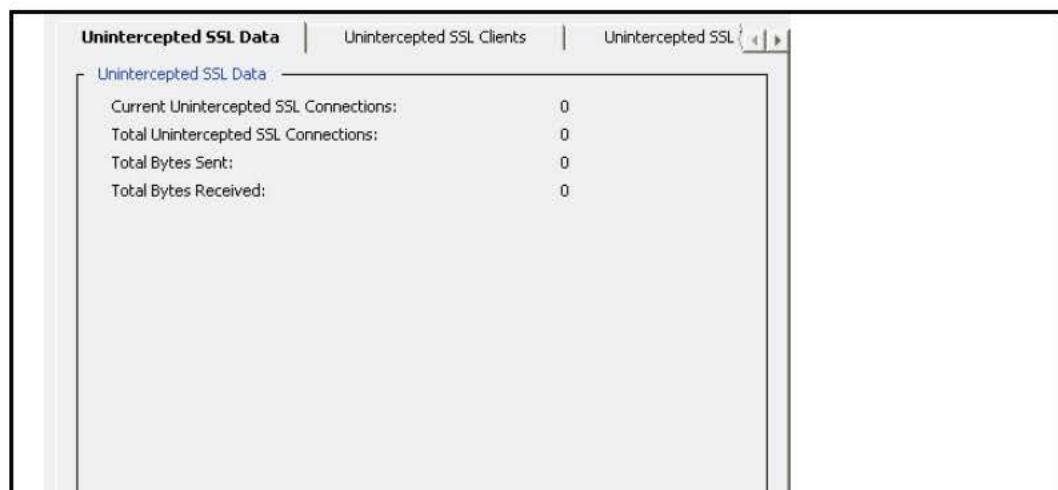
Table 12-1. Unintercepted SSL Data Statistics

Status	Description
Current Unintercepted SSL Sessions	The current number of unintercepted SSL client connections.
Total Unintercepted SSL Sessions	The cumulative number of unintercepted SSL client connections since the SG appliance was last rebooted.
Total Bytes Sent	The total number of unintercepted bytes sent.
Total Bytes Received	The total number of unintercepted bytes received.

To view unintercepted SSL data statistics:

From the Management Console, select **Statistics > Protocol Details > SSL History > Unintercepted SSL Data**.

The default view shows all unintercepted SSL data.



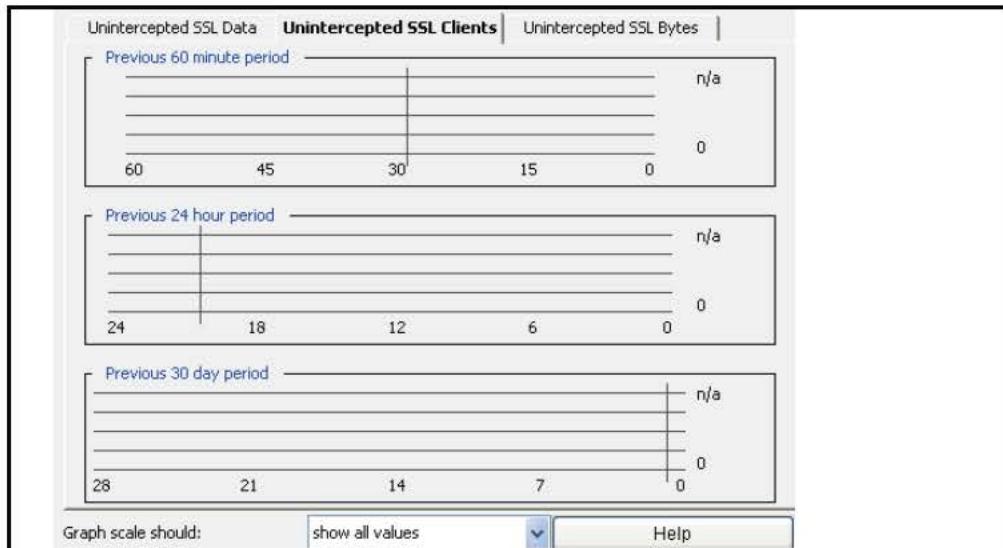
Section C: Viewing SSL Statistics

Unintercepted SSL Clients

The Unintercepted SSL Clients tab displays dynamic graphical statistics for connections received in the last 60-minute, 24-hour, or 30-day period.

To view SSL client unintercepted statistics:

1. From the Management Console, select **Statistics > Protocol Details > SSL History > Unintercepted SSL Clients**.



2. (Optional) To set the graph scale to a different value, select a value from the **Graph scale should** drop-down list.

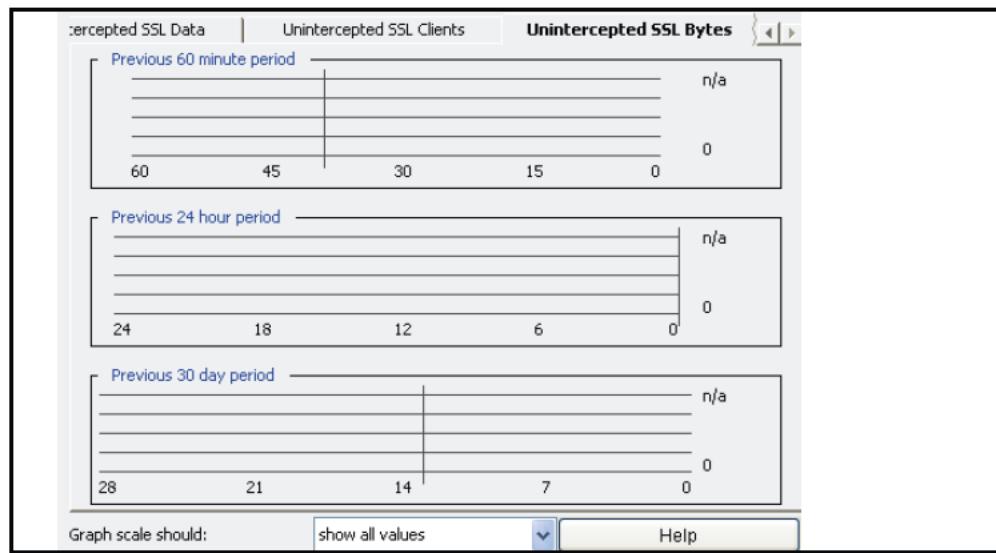
Unintercepted SSL Bytes

The Unintercepted SSL Bytes tab displays dynamic graphical statistics for bytes received in the last 60-minute, 24-hour, or 30-day period.

To view unintercepted SSL byte statistics:

1. From the Management Console, select **Statistics > Protocol Details > SSL History > Unintercepted SSL Bytes**.

Section C: Viewing SSL Statistics



2. (Optional) To set the graph scale to a different value, select a value from the **Graph scale should** drop-down list.

Section D: Advanced Topics

Section D: Advanced Topics

If you use OpenSSL or Active Directory, you can follow the procedures below to manage your certificates.

For OpenSSL, see "Creating an Intermediate CA using OpenSSL" on page 157; if using Active Directory, see "Creating an Intermediate CA using Microsoft Server 2003 (Active Directory)" on page 159.

Creating an Intermediate CA using OpenSSL

This section describes the certificate management when creating an intermediate CA using OpenSSL.

The overall steps are:

- "Installing OpenSSL" on page 157
- "Creating a Root Certificate" on page 157
- "Modifying the OpenSSL.cnf File" on page 158
- "Signing the SG CSR" on page 158
- "Importing the Certificate into the SG Appliance" on page 159
- "Testing the Configuration" on page 159

Various OpenSSL distributions can be found at <http://www.openssl.org>.

Installing OpenSSL

Once OpenSSL is installed, you must edit the `openssl.cnf` file and ensure the pathnames are correct. By default root certificates are located under `./PEM/DemoCA`; generated certificates are located under `/certs`.

Creating a Root Certificate

In order to create a root Certificate Authority (CA) certificate, complete the following steps.

Note: The key and certificate in this example is located at `./bin/PEM/demoCA/private/`

1. Open a MS-DOS window, and enter:

```
openssl req -new -x509 -keyout  
c:\resources\ssl\openssl\bin\PEM\demoCA\private\  
cakey.pem -out  
c:\resources\ssl\openssl\bin\PEM\demoCA\private\CAcert.pem
```

where the root directory for openssl is: \resources\ssl\openssl

```
openssl req -new -x509 -keyout  
c:\resources\ssl\openssl\bin\PEM\demoCA\private\cakey.pem -out  
c:\resources\ssl\openssl\bin\PEM\demoCA\private\CAcert.pem  
Using configuration from C:\Resources\SSL\OpenSSL\bin\openssl.cnf  
Loading 'screen' into random state - done  
Generating a 1024 bit RSA private key
```

Section D: Advanced Topics

```
.....+++++
.....+++++
writing new private key to
'c:\resources\ssl\openssl\bin\PEM\demoCA\private\cakey.pem'
Enter PEM pass phrase:
```

2. Type any string more than four characters for the PEM pass phrase.
3. Enter the certificate parameters, such as country name, common name that are required for a Certificate Signing Request (CSR).

The private key and root CA are now located under the directory ./PEM/DemoCA/private

4. Create a SG keyring.
 - a. From the Management Console, select **Configuration > SSL > Keyrings**.
 - b. Click **Create**; fill in the fields as appropriate.
 - c. Click **OK**.
5. Create a CSR on the SG appliance.
 - a. From the Management Console, select **Configuration > SSL > Keyrings**.
 - b. Highlight the keyring you just created; click **Edit/View**.
 - c. In the Certificate Signing Request pane, click **Create** and fill in the fields as appropriate.

Note: Detailed instructions on creating a keyring and a CSR are in *Volume 5: Securing the Blue Coat SG Appliance*. They can also be found in the online help.

6. Paste the contents of the CSR into a text file called new.pem located in the ./bin directory.

Modifying the OpenSSL.cnf File

Modify the openssl.cnf file to import the openSSL root CA into your browser. If you do not do this step, you must import the SG appliance certificate into the browser.

1. In the openssl.cnf file, look for the string basicConstraints=CA, and set it to TRUE.
basicConstraints=CA:TRUE
2. Save the openssl.cnf file.

Signing the SG CSR

Open a MS-DOS window and enter:

```
openssl ca -policy policyAnything -out newcert.pem -in new.pem
```

The output is:

```
Using configuration from C:\Resources\SSL\OpenSSL\bin\openssl.cnf
Enter PEM pass phrase:
Check that the request matches the signature
Signature ok
The Subjects Distinguished Name is as follows
countryName          :PRINTABLE:'FR'
stateOrProvinceName :PRINTABLE:'Paris'
```

Section D: Advanced Topics

```
localityName          :PRINTABLE:'Paris'
organizationName      :PRINTABLE:'BlueCoat'
organizationalUnitName:PRINTABLE:'Security Team'
commonName            :PRINTABLE:'ProxySG.bluecoat.com'
emailAddress          :IA5STRING:'support@bc.com'
Certificate is to be certified until Sep 27 13:29:09 2006 GMT (365
days)
Sign the certificate? [y/n]:y
1 out of 1 certificate requests certified, commit? [y/n]y
Write out database with 1 new entries
Data Base Updated
```

This signs the certificate; it can then be imported into the SG appliance.

Importing the Certificate into the SG Appliance

1. Open the file `newcert.pem` in a text editor.
2. Go to the **Management Console > Configuration > SSL > SSL Keyrings**.
3. Selecting the keyring used for SSL interception; click **Edit/View**.
4. Paste in the contents of the `newcert.pem` file.
5. Import the contents of the `newcert.pem` file into the CA Certificates list.
 - a. From the Management Console, select **Configuration > SSL > CA Certificates**.
 - b. Click **Import**; enter the certificate name in the CA Cert Name field.
 - c. Paste the certificate, being sure to include the **-----BEGIN CERTIFICATE-----** and the **-----END CERTIFICATE-----** statements in the `./bin/PEM/demoCA/private/CACert` file.
 - d. Click **OK**.

Note: Detailed instructions on importing a CA certificate are in [Chapter 9: "Creating and Editing an HTTPS Reverse Proxy Service" on page 113](#).

Testing the Configuration

Import the root CA into your browser and construct an SSL interception policy.

9ta

Note: Detailed instructions on constructing an SSL interception policy are in ["Configuring SSL Rules through Policy" on page 147](#).

You should not be prompted for any certificate warning.

Creating an Intermediate CA using Microsoft Server 2003 (Active Directory)

This section describes certificate management when creating an intermediate CA using Active Directory.

Before you begin:

- Make sure the Windows 2003 system is an Active Directory server.
- Make sure IIS is installed.

Section D: Advanced Topics

- Install the "Certificate Services" through the control panel
- Select the mode to be Enterprise root CA.

All certificate management is done through the browser using the following URL:

http://@ip_server/CertSrv

You will complete the following steps:

- "To install the root CA onto the browser:" on page 160
- "To create a SG keyring and certificate signing request:" on page 160
- "To sign the SG CSR:" on page 160
- "To import the certificate onto the SG appliance:" on page 160
- "To test the configuration:" on page 161

To install the root CA onto the browser:

1. Connect to HTTP://@ip_server/CertSrv
2. Click **Download a CA Certificate**.
3. Click **Install this CA Certificate chain**.

This installs the root CA onto the browser.

To create a SG keyring and certificate signing request:

1. From the Management Console, go to **SSL > Keyrings**.
2. Create a new keyring. For detailed instructions on creating a new keyring, refer to *Volume 5: Securing the Blue Coat SG Appliance*.
3. Create a Certificate Signing Request (CSR). For detailed instructions on creating a CSR, refer to *Volume 5: Securing the Blue Coat SG Appliance*.
4. Click **OK**.

To sign the SG CSR:

1. Connect to http://@ip_server/CertSrv
2. Select the option **Request a certificate**.
3. Select **Submit an advanced certificate request** and then **Submit a certificate request by using a base 64 encoded ...**
4. Paste the contents of the CSR.
5. Select the Certificate Template **Subordinate Certification Authority**.
If this template does not exist, connect to the certificate manager tool on the Active Directory server and add the template.
6. Click on **Submit**.
7. Download the certificate (not the chain) as **Base 64 encoded**.
8. Save this file on the workstation as `newcert.pem`.

To import the certificate onto the SG appliance:

1. Open the file `newcert.pem` in a text editor.

Section D: Advanced Topics

2. Go to the **Management Console > Configuration > SSL > SSL Keyrings**.
3. Select the keyring that has the CSR created; click **Edit/View**.

Note: Make sure this keyring is used as the issuer keyring for emulated certificates. Use policy or the SSL intercept setting in the Management Console or the CLI.

4. Paste the contents of the newcert.pem file.
5. Import the contents of the newcert.pem file into the CA Certificates list.
 - a. From the Management Console, select **Configuration > SSL > CA Certificates**.
 - b. Click **Import**; enter the certificate name in the CA Cert Name field.
 - c. Paste the certificate, being sure to include the -----BEGIN CERTIFICATE----- and the -----END CERTIFICATE----- statements in the ./bin/PEM/demoCA/private/CAcert file.
 - d. Click **OK**.

Note: Detailed instructions on importing a CA certificate are in [Chapter 9: "Creating and Editing an HTTPS Reverse Proxy Service" on page 113](#).

To test the configuration:

Import the root CA into your browser and construct a SSL interception policy.

Note: Detailed instructions on constructing an SSL interception policy are in ["Configuring SSL Rules through Policy" on page 147](#).

You should not be prompted for any certificate warning.

Chapter 13: Managing the TCP Tunneling Proxy

Tunneling, or port forwarding, is a way to forward TCP traffic. Any application protocol running over TCP can be tunneled using this service. Client-server applications carry out any authentication procedures just as they do when TCP tunneling is not involved.

SGOS uses a `tcp://` scheme for TCP-tunnel transactions instead of HTTPS because SGOS does not actually know that it is HTTPS that is being tunneled.

You can use ADN optimization in conjunction with TCP tunnels to compress and accelerate the tunneled traffic. Both explicit and transparent TCP tunneling are supported. Which one you use depends on your needs.

- Explicit* TCP tunneling allows connections to one of the SG appliance's IP addresses.
- Transparent* TCP tunneling allows connections to any IP address other than those belonging to the SG appliance. TCP tunneling in transparent mode supports categorization as well as blocking of destination IP address, port, host, and domain.

Note: The TCP-Tunnel service does not support content filtering with Websense offbox or ICAP.

TCP-Tunnel Proxy Services Supported

A number of proxy services are supported with the TCP-Tunnel proxy. For the most current list, see [Table 3-1: "Proxy Name and Listeners" on page 24](#).

In addition, the default proxy service (which listens on all ports not assigned to other services), uses the TCP-Tunnel proxy. The default proxy service has only one listener; its action can be set to bypass or intercept. No new listeners can be added to the default proxy service, and the default listener and service cannot be deleted. Service attributes can be changed.

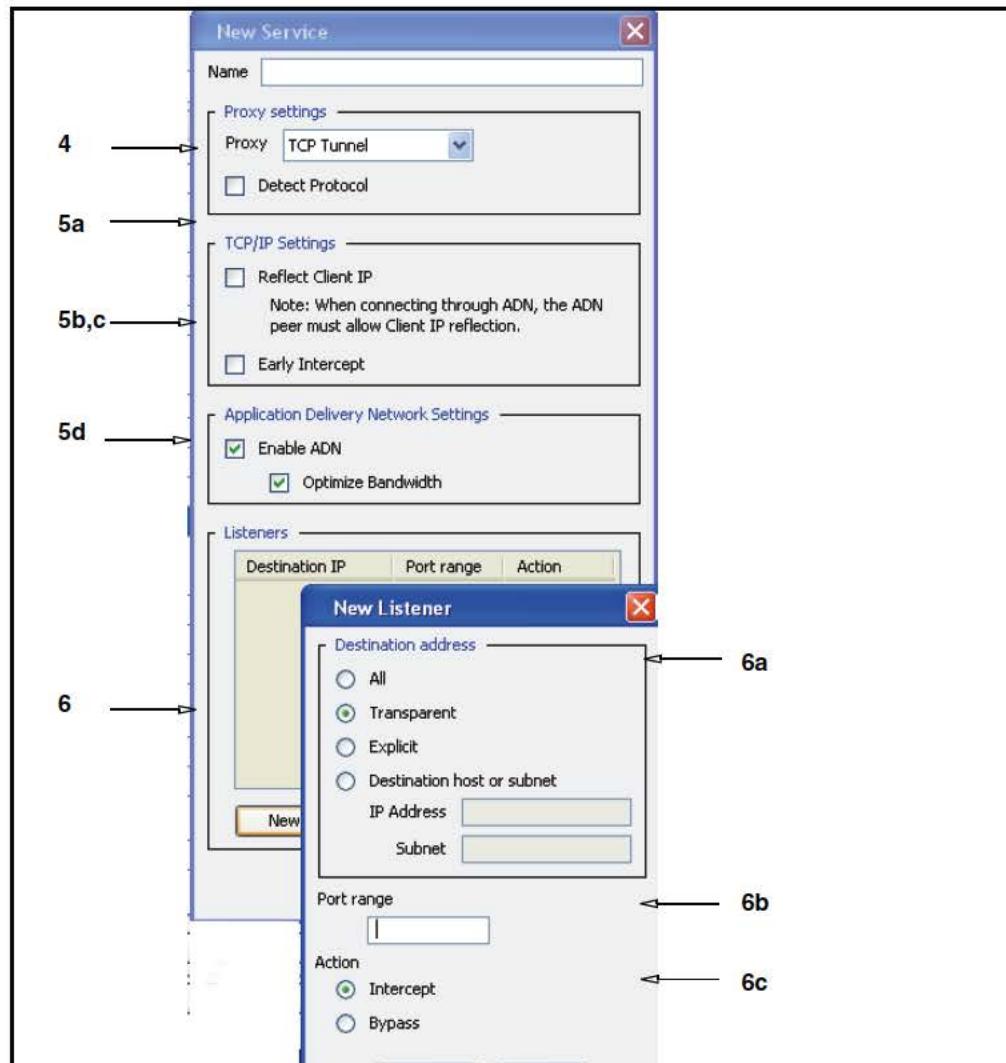
To keep the SG appliance from interfering with unassigned traffic, set the behavior to bypass.

An access log entry is available for every TCP tunnel connection.

Creating or Editing a TCP-Tunnel Proxy Service

1. Select **Configuration > Services > Proxy Services**.
2. To edit a TCP-Tunnel proxy service, highlight the service and click **Edit**. To create a new proxy service, click **New**.

Note: If you only want to change the proxy's behavior from bypass (the default) to intercept, go to the **Action** column of the **Proxy Services** pane, select the service whose behavior you want to change, and select **Intercept** from the drop-down list. You do not need to enter **New/Edit** mode to change this attribute.



3. In the **Name** field, choose a meaningful name for the new proxy service.
4. Make sure the correct proxy type is selected in the **Proxy settings** panel.
5. Select or de-select the checkboxes, as appropriate, for the service being set up.

- a. Select the **Detect Protocol** checkbox to automatically detect the protocol being used. Note that this breaks connections that do not have the client send information first, but expect the server to respond on connection. It also can add significant delay if the client does not send specific information.
 - b. **Reflect Client IP:** Enables or disables sending of client's IP address instead of the SG appliance's IP address.
 - c. **Early intercept:** Controls whether the proxy responds to client TCP connection requests before connecting to the upstream server. When early intercept is disabled, the proxy delays responding to the client until after it has attempted to contact the server.
 - d. **Enable ADN.** Select this checkbox if you want this service to use ADN. Note that enabling ADN does not guarantee the connections are accelerated by ADN. The actual enable decision is determined by ADN routing (for explicit deployment) and network setup (for transparent deployment).
 - e. The **Optimize Bandwidth** checkbox is selected by default if you enabled ADN optimization during initial configuration. You should de-select the checkbox if you are not configuring ADN optimization.
6. To create a new listener, click **New**.
 - a. Select a Destination IP address from the drop-down menu.
 - b. In the **Port Range** field, enter the ports on which the service should listen. The default ports for each service are listed in [Table 3-1. "Proxy Name and Listeners" on page 24](#).
 - c. Select the default action for the service: **Bypass** tells the service to ignore any traffic. **Intercept** configures the service to intercept the traffic that is being proxied.
 - If you selected **Optimize all other TCP traffic** during initial configuration, all listeners in services that use the TCP-Tunnel proxy intercept traffic. If you did not select **Optimize all other TCP traffic**, TCP-Tunnel listeners bypass all traffic by default.
 7. Click OK; click **Apply**.

Related CLI Syntax to Create/Edit a Tunneling Proxy Service

- ❑ To enter configuration mode:

```
SGOS#(config) proxy-services
SGOS#(config proxy-services) create tcp-tunnel service-name
SGOS#(config proxy-services) edit service-name
```
- ❑ The following subcommands are available:

```
SGOS#(config service-name) add {transparent | explicit | all |
ip_address | ip_address/subnet-mask} {port | first_port-last_port}
[intercept | bypass]
SGOS#(config service-name) attribute {adn-optimize {enable | disable} |
detect-protocol {enable | disable}| early-intercept {enable |
disable}| reflect-client-ip {enable | disable} | use-adn {enable |
disable}}
SGOS#(config service-name) bypass {transparent | explicit | all |
ip_address | ip_address/subnet-mask} {port | first_port-last_port}
SGOS#(config service-name) exit
SGOS#(config service-name) intercept {transparent | explicit | all |
ip_address | ip_address/subnet-mask} {port | first_port-last_port}
```

```
SGOS#(config service-name) remove {transparent | explicit | all |
ip_address | ip_address/subnet-mask} {port | first_port-last_port}
SGOS#(config service-name) view
```

If you created a transparent TCP-Tunnel service, the procedure is complete. If you created an explicit TCP-Tunnel service, you must configure a forwarding destination port.

To configure a forwarding destination port:

1. Create a forwarding destination port, where the SG appliance directs traffic.

```
SGOS#(config proxy-services tcp-tunnel) exit
SGOS#(config proxy-services) exit
SGOS#(config) forwarding
SGOS#(config forwarding) create host_alias ip_address tcp=port
```

2. (Optional) View the results:

```
SGOS#(config forwarding) view
Forwarding Groups: (* = host unresolved)
No forwarding groups defined.
Individual Hosts: (* = host unresolved)
Host Alias 10.25.36.47 tcp=port_number
```

Appendix A: Glossary

Term	Description
ADN Optimize Attribute	Controls whether to optimize bandwidth usage when connecting upstream using an ADN tunnel.
Asynchronous Adaptive Refresh (AAR)	This allows the ProxySG to keep cached objects as fresh as possible, thus reducing response times. The AAR algorithm allows HTTP proxy to manage cached objects based on their rate of change and popularity: an object that changes frequently and/or is requested frequently is more eligible for asynchronous refresh compared to an object with a lower rate of change and/or popularity.
Asynchronous Refresh Activity	Refresh activity that does not wait for a request to occur, but that occurs <i>asynchronously</i> from the request.
Attributes (Service)	The service attributes define the parameters, such as explicit or transparent, cipher suite, and certificate verification, that the SG appliance uses for a particular service. .
Authenticate-401 Attribute	All transparent and explicit requests received on the port always use transparent authentication (cookie or IP, depending on the configuration). This is especially useful to force transparent proxy authentication in some proxy-chaining scenarios
authentication	The process of identifying a specific user.
authorization	The permissions given to a specific user.
Bandwidth Gain	A measure of the difference in client-side and server-side Internet traffic expressed in relation to server-side Internet traffic. It is managed in two ways: you can enable or disable bandwidth gain mode or you can select the Bandwidth Gain profile (this also enables bandwidth gain mode)..
Bandwidth Class	A defined unit of bandwidth allocation. An administrator uses bandwidth classes to allocate bandwidth to a particular type of traffic flowing through the SG appliance.
Bandwidth Class Hierarchy	Bandwidth classes can be grouped together in a class hierarchy, which is a tree structure that specifies the relationship among different classes. You create a hierarchy by creating at least one parent class and assigning other classes to be its children.
Bandwidth Policy	The set of rules that you define in the policy layer to identify and classify the traffic in the SG appliance, using the bandwidth classes that you create. You must use policy (through either VPM or CPL) in order to manage bandwidth.
Bypass Lists	The bypass list allows you to exempt IP addresses from being proxied by the SG appliance. The bypass list allows either <All> or a specific IP prefix entry for both the client and server columns. Both UDP and TCP traffic is automatically exempted.

Term	Description
Byte-Range Support	The ability of the ProxySG to respond to byte-range requests (requests with a Range : HTTP header).
Cache-hit	An object that is in the ProxySG and can be retrieved when an end user requests the information.
Cache-miss	An object that can be stored but has never been requested before; it was not in the ProxySG to start, so it must be brought in and stored there as a side effect of processing the end-user's request. If the object is cacheable, it is stored and served the next time it is requested.
Child Class (Bandwidth Gain)	The child of a parent class is dependent upon that parent class for available bandwidth (they share the bandwidth in proportion to their minimum/maximum bandwidth values and priority levels). A child class with siblings (classes with the same parent class) shares bandwidth with those siblings in the same manner.
Client consent certificates	A certificate that indicates acceptance or denial of consent to decrypt an end user's HTTPS request.
Compression	An algorithm that reduces a file's size but does not lose any data. The ability to compress or decompress objects in the cache is based on policies you create. Compression can have a huge performance benefit, and it can be customized based on the needs of your environment: Whether CPU is more expensive (the default assumption), server-side bandwidth is more expensive, or whether client-side bandwidth is more expensive.
Default Proxy Listener	See “ Proxy Service (Default) ” on page 171.
Detect Protocol Attribute	Detects the protocol being used. Protocols that can be detected include: HTTP, P2P (eDonkey, BitTorrent, FastTrack, Gnutella), SSL, and Endpoint Mapper.
Directives	Directives are commands that can be used in installable lists to configure forwarding. See also <i>forwarding Configuration</i> .
Display Filter	The display filter is a drop-down list at the top of the Proxy Services pane that allows you to view the created proxy services by service name or action.
Early Intercept Attribute	Controls whether the proxy responds to client TCP connection requests before connecting to the upstream server. When early intercept is disabled, the proxy delays responding to the client until after it has attempted to contact the server.
Emulated Certificates	Certificates that are presented to the user by ProxySG when intercepting HTTPS requests. Blue Coat emulates the certificate from the server and signs it, copying the subjectName and expiration. The original certificate is used between the ProxySG and the server.
ELFF-compatible format	A log type defined by the W3C that is general enough to be used with any protocol.
Encrypted Log	A log is encrypted using an external certificate associated with a private key. Encrypted logs can only be decrypted by someone with access to the private key. The private key is not accessible to the SG appliance.

Term	Description
explicit proxy	<p>A configuration in which the browser is explicitly configured to communicate with the proxy server for access to content.</p> <p>This is the default for the SG appliance, and requires configuration for both browser and the interface card.</p>
Fail Open/Closed	<p>Failing open or closed applies to forwarding hosts and groups and SOCKS gateways. Fail Open/Closed applies when the health checks are showing sick for each forwarding or SOCKS gateway target in the applicable fail-over sequence. If no systems are healthy, the SG appliance fails open or closed, depending on the configuration. If closed, the connection attempt simply fails.</p> <p>If open, an attempt is made to connect without using any forwarding target (or SOCKS gateway). Fail open is usually a security risk; fail closed is the default if no setting is specified.</p>
Forwarding Configuration	<p>Forwarding can be configured through the CLI or through adding directives to a text file and installing it as an installable list. Each of these methods (the CLI or using directives) is equal. You cannot use the Management Console to configure forwarding.</p>
Forwarding Host	<p>Upstream Web servers or proxies.</p>
forward proxy	<p>A proxy server deployed close to the clients and used to access many servers. A forward proxy can be explicit or transparent.</p>
Freshness	<p>A percentage that reflects the objects in the ProxySG cache that are expected to be fresh; that is, the content of those objects is expected to be identical to that on the OCS (origin content server).</p>
Gateway	<p>A device that serves as entrance and exit into a communications network.</p>
Global Default Settings	<p>You can configure settings for all forwarding hosts and groups. These are called the global defaults. You can also configure private settings for each individual forwarding host or group. Individual settings override the global defaults.</p>
FTP	<p>See Native FTP; Web FTP.</p>
Host Affinity	<p>Host affinity is the attempt to direct multiple connections by a single user to the same group member. Host affinity is closely tied to load balancing behavior; both should be configured if load balancing is important.</p>
Host Affinity Timeout	<p>The host affinity timeout determines how long a user remains idle before the connection is closed. The timeout value checks the user's IP address, SSL ID, or cookie in the host affinity table.</p>
Inbound Traffic (Bandwidth Gain)	<p>Network packets flowing into the SG appliance. Inbound traffic mainly consists of the following:</p> <ul style="list-style-type: none"> • Server inbound: Packets originating at the origin content server (OCS) and sent to the SG appliance to load a Web object. • Client inbound: Packets originating at the client and sent to the SG appliance for Web requests.

Term	Description
Installable Lists	Installable lists, comprised of directives, can be placed onto the SG appliance in one of several methods: through creating the list through the SG text editor, by placing the list at an accessible URL, or by downloading the directives file from the local system.
Integrated Host Timeout	An integrated host is an Origin Content Server (OCS) that has been added to the health check list. The host, added through the <code>integrate_new_hosts</code> property, ages out of the integrated host table after being idle for the specified time. The default is 60 minutes.
IP Reflection	Determines how the client IP address is presented to the origin server for explicitly proxied requests. All proxy services contain a <code>reflect-ip</code> attribute, which enables or disables sending of client's IP address instead of the SG's IP address.
Issuer keyring	The keyring that is used by the SG appliance to sign emulated certificates. The keyring is configured on the appliance and managed through policy.
Listener	The service that is listening on a specific port. A listener can be identified by any destination IP/subnet and port range. Multiple listeners can be added to each service.
Load Balancing	The ability to share traffic requests among multiple upstream targets. Two methods can be used to balance the load among systems: <code>least-connections</code> or <code>round-robin</code> .
Log Facility	A separate log that contains a single logical file and supports a single log format. It also contains the file's configuration and upload schedule information as well as other configurable information such as how often to rotate (switch to a new log) the logs at the destination, any passwords needed, and the point at which the facility can be uploaded.
Log Format	<p>The type of log that is used: NCSA/Common, SQUID, ELFF, SurfControl, or Websense.</p> <p>The proprietary log types each have a corresponding pre-defined log format that has been set up to produce exactly that type of log (these logs cannot be edited). In addition, a number of other ELFF type log formats are also pre-defined (im, main, p2p, ssl, streaming). These can be edited, but they start out with a useful set of log fields for logging particular protocols understood by the SG appliance. It is also possible to create new log formats of type ELFF or Custom which can contain any desired combination of log fields.</p>
Log Tail:	The access log tail shows the log entries as they get logged. With high traffic on the SG appliance, not all access log entries are necessarily displayed. However, you can view all access log information after uploading the log.
Maximum Object Size	The maximum object size stored in the ProxySG. All objects retrieved that are greater than the maximum size are delivered to the client but are not stored in the ProxySG.
NCSA common log format	A log type that contains only basic HTTP access information.

Term	Description
Negative Responses	An error response received from the OCS when a page or image is requested. If the ProxySG is configured to cache such negative responses, it returns that response in subsequent requests for that page or image for the specified number of minutes. If it is not configured, which is the default, the ProxySG attempts to retrieve the page or image every time it is requested.
Native FTP	Native FTP involves the client connecting (either explicitly or transparently) using the FTP protocol; the SG appliance then connects upstream through FTP (if necessary).
Outbound Traffic (Bandwidth Gain)	<p>Network packets flowing out of the SG appliance. Outbound traffic mainly consists of the following:</p> <ul style="list-style-type: none"> Client outbound: Packets sent to the client in response to a Web request. Server outbound: Packets sent to an OCS or upstream proxy to request a service.
Origin Content Server (OCS)	
Parent Class (Bandwidth Gain)	A class with at least one child. The parent class must share its bandwidth with its child classes in proportion to the minimum/maximum bandwidth values or priority levels.
PASV	Passive Mode Data Connections. Data connections initiated by an FTP client to an FTP server.
proxy	<p>Caches content, filters traffic, monitors Internet and intranet resource usage, blocks specific Internet and intranet resources for individuals or groups, and enhances the quality of Internet or intranet user experiences.</p> <p>A proxy can also serve as an intermediary between a Web client and a Web server and can require authentication to allow identity based policy and logging for the client.</p> <p>The rules used to authenticate a client are based on the policies you create on the SG appliance, which can reference an existing security infrastructure—LDAP, RADIUS, IWA, and the like.</p>
Proxy Service	The proxy service defines the ports, as well as other attributes, that are used by the proxies associated with the service.
Proxy Service (Default)	The default proxy service is a service that intercepts all traffic not otherwise intercepted by other listeners. It only has one listener whose action can be set to bypass or intercept. No new listeners can be added to the default proxy service, and the default listener and service cannot be deleted. Service attributes can be changed.
realms	A realm is a named collection of information about users and groups. The name is referenced in policy to control authentication and authorization of users for access to Blue Coat Systems SG services. Multiple authentication realms can be used on a single SG appliance. Realm services include IWA, LDAP, Local, and RADIUS.
Reflect Client IP Attribute	Enables the sending of the client's IP address instead of the SG's IP address to the upstream server. If you are using an Application Delivery Network (ADN), this setting is enforced on the concentrator proxy through the Configuration>App. Delivery Network>Tunneling tab.

Term	Description
Refresh Bandwidth	The amount of bandwidth used to keep stored objects fresh. By default, the ProxySG is set to manage refresh bandwidth automatically. You can configure refresh bandwidth yourself, although Blue Coat does not recommend this.
reverse proxy	A proxy that acts as a front-end to a small number of pre-defined servers, typically to improve performance. Many clients can use it to access the small number of predefined servers.
rotate logs	<p>When you rotate a log, the old log is no longer appended to the existing log, and a new log is created. All the facility information (headers for passwords, access log type, and so forth), is re-sent at the beginning of the new upload.</p> <p>If you're using Reporter (or anything that doesn't understand the concept of "file," such as streaming) the upload connection is broken and then re-started, and, again, the headers are re-sent.</p>
serial console	<p>A device that allows you to connect to the SG appliance when it is otherwise unreachable, without using the network. It can be used to administer the SG appliance through the CLI. You must use the CLI to use a serial console.</p> <p>Anyone with access to the serial console can change the administrative access controls, so physical security of the serial console is critical.</p>
Server Certificate Categories	The hostname in a server certificate can be categorized by BCWF or another content filtering vendor to fit into categories such as banking, finance, sports.
Sibling Class (Bandwidth Gain)	A bandwidth class with the same parent class as another class.
SOCKS Proxy	A generic way to proxy TCP and UDP protocols. The SG appliance supports both SOCKSv4/4a and SOCKSv5; however, because of increased username and password authentication capabilities and compression support, Blue Coat recommends that you use SOCKS v5..
SmartReporter log type	A proprietary ELFF log type that is compatible with the SmartFilter SmartReporter tool.
Split proxy	<p>Employs co-operative processing at the branch and the core to implement functionality that is not possible in a standalone proxy. Examples of split proxies include :</p> <ul style="list-style-type: none"> Mapi Proxy SSL Proxy
SQUID-compatible format	A log type that was designed for cache statistics.
SSL	A standard protocol for secure communication over the network. Blue Coat recommends using this protocol to protect sensitive information.
SSL Interception	Decrypting SSL connections.
SSL Proxy	A proxy that can be used for any SSL traffic (HTTPS or not), in either forward or reverse proxy mode.

Term	Description
static routes	A manually-configured route that specifies the transmission path a packet must follow, based on the packet's destination address. A static route specifies a transmission path to another network.
SurfControl log type	A proprietary log type that is compatible with the SurfControl reporter tool. The SurfControl log format includes fully-qualified usernames when an NTLM realm provides authentication. The simple name is used for all other realm types.
Traffic Flow (Bandwidth Gain)	<p>Also referred to as <i>flow</i>. A set of packets belonging to the same TCP/UDP connection that terminate at, originate at, or flow through the SG appliance. A single request from a client involves two separate connections. One of them is from the client to the SG appliance, and the other is from the SG appliance to the OCS. Within each of these connections, traffic flows in two directions—in one direction, packets flow out of the SG appliance (outbound traffic), and in the other direction, packets flow into the SG (inbound traffic). Connections can come from the client or the server. Thus, traffic can be classified into one of four types:</p> <ul style="list-style-type: none"> • Server inbound • Server outbound • Client inbound • Client outbound <p>These four traffic flows represent each of the four combinations described above. Each flow represents a single direction from a single connection.</p>
transparent proxy	A configuration in which traffic is redirected to the SG appliance without the knowledge of the client browser. No configuration is required on the browser, but network configuration, such as an L4 switch or a WCCP-compliant router, is required.
Variants	Objects that are stored in the cache in various forms: the original form, fetched from the OCS; the transformed (compressed or uncompressed) form (if compression is used). If a required compression variant is not available, then one might be created upon a cache-hit. (Note: policy-based content transformations are not stored in the ProxySG.)
Web FTP	Web FTP is used when a client connects in explicit mode using HTTP and accesses an <code>ftp://</code> URL. The SG appliance translates the HTTP request into an FTP request for the OCS (if the content is not already cached), and then translates the FTP response with the file contents into an HTTP response for the client.
Websense log type	A proprietary log type that is compatible with the Websense reporter tool.

Term	Description
Wildcard Services	<p>When multiple non-wildcard services are created on a port, all of them must be of the same service type (a wildcard service is one that is listening for that port on all IP addresses). If you have multiple IP addresses and you specify IP addresses for a port service, you cannot specify a different protocol if you define the same port on another IP address. For example, if you define HTTP port 80 on one IP address, you can only use the HTTP protocol on port 80 for other IP addresses.</p> <p>Also note that wildcard services and non-wildcard services cannot both exist at the same time on a given port.</p> <p>For all service types except HTTPS, a specific listener cannot be posted on a port if the same port has a wildcard listener of any service type already present.</p>

Appendix B: Explicit and Transparent Proxy

Whether you select explicit or transparent proxy deployment is determined by factors such as network configuration, number of desktops, desired user experience, and desired authentication approach.

Note: While you must configure proxying to do authentication, verify the proxy is configured correctly and is functioning before adding authentication to the mix. Many network or other configuration problems can appear similar to authentication errors.

Understanding the Explicit Proxy

In an explicit proxy configuration, the client (browser) is explicitly configured to use a proxy server. The browser is given the IP address and port number of the proxy service (the SG appliance). It is also possible to configure the browser to download the proxy settings from a Web server. This is called a Proxy Auto-Configuration (PAC) file. When a user makes a request, the browser connects to the proxy service and sends the request. Because the browser knows it is talking to a proxy, the browser provides the proxy server with the destination server.

The proxy service accepts the explicit connection to it, and fetches the request from the browser. The request identifies the desired origin content server (OCS) and the resource on that server. The proxy service uses this information to contact the OCS if necessary. The disadvantage to explicit proxy is that each desktop must be properly configured to use the proxy, which might not be feasible in a large organization.

Note: Explicit proxy allows a redundant configuration using IP address failover among a cluster of machines. For information on creating a redundant configuration for failover, refer to *Volume 6: Advanced Networking*.

Understanding the Transparent Proxy

When transparent proxy is enabled, the client (browser) does not know the traffic is being processed by a machine other than the OCS. The browser believes it is talking to the OCS, so the request is formatted for the OCS and 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.

To enable the SG appliance to intercept traffic sent to it, you must create a service and define it as transparent. The service is configured to intercept traffic for a specified port, or for all IP addresses on that port. A transparent HTTP proxy, for example, typically intercepts all traffic on port 80 (all IP addresses).

To make sure that the appropriate traffic is directed to the SG appliance, deploy hardware such as a Layer-4 switch or a WCCP router, or the SG appliance's software bridge that can redirect selected traffic to the appliance. Traffic redirection is managed through policies you create on the redirection device.

For detailed information on explicit proxies, continue with the next section; for detailed information on transparent proxies, continue with “[Transparent Proxies](#)” on page 177.

For information on creating an explicit proxy server, regardless of proxy type, continue with “[Creating an Explicit Proxy Server](#)” on page 176.

Creating an Explicit Proxy Server

If your network does not use transparent proxy, clients on the network must configure their browsers to use either an explicit proxy server or a Proxy Auto-Configuration (PAC) file.

Two PAC files ship with the SG appliance:

- PAC file.
- Accelerated PAC file.

They can be accessed at:

- https://SG_IP_Address:8082/accelerated_pac_base.pac
- https://SG_IP_Address:8082/proxy_pac_file

They can be edited with any text editor.

The SG appliance generates client instructions that describe how to configure Microsoft Internet Explorer, Netscape Communicator, and Firefox based on instructions selected by the SG administrator. You can configure client instructions for each network adapter in the SG appliance with the **Configuration > Network > Adapters > Interface > Settings** button.

After selecting client instructions, the SG administrator directs clients to go to the SG home page and follow the instructions in the Browser Configuration section. The SG appliance detects the browser installed on the client and displays the appropriate instructions.

Using the SG Appliance as an Explicit Proxy

To use the SG appliance as an explicit proxy and use services such as SOCKS or FTP, you must provide custom instructions to clients instructing them how to configure their browsers to use the SG appliance as a proxy server.

This is a two-step process, requiring that you add the proxy IP address to the browser and also instruct the SG appliance which adapter interface uses the proxy IP address.

Before the proxy can be used, you must:

- Configure the proxy server.
- Enable the explicit proxy (whether a service or a server).

The browsers described here are Internet Explorer 6.0 and Firefox 1.5. If you have different browsers or different versions of Internet Explorer or Firefox, refer to the vendor documentation for information on configuring proxies.

From Internet Explorer:

1. Select **Tools > Internet Options > Connections > LAN Settings**.
2. Click **Use a proxy server**.
3. Enter the IP address and port number for the proxy, or click **Advanced** to set proxy server IP addresses and port numbers for services such as HTTP, FTP, and SOCKS. (Configure HTTPS through the **Secure** field.)
4. Click **OK** to exit the **Advanced Settings** tab, then continue to click **OK** until you exit the **Tools** menu.

From Firefox:

1. Select **Tools > Options > Genera l> Connection Settings**.
2. Click **Manual proxy configuration**.
3. Enter proxy server IP addresses and port numbers for services such as HTTP, FTP, SOCKS, and SSL.
4. Click **OK**; click **OK** again.

Configuring Adapter Proxy Settings

Once the explicit proxy is configured on the browser, decide which adapter interfaces listen for which service. Each adapter interface can listen for only one IP address; you can configure multiple proxies on one SG appliance using the same IP address.

To provide configuration instructions on the SG appliance:

1. Select **Configuration > Network > Adapters**.
2. In the Adapter pane, select the adapter you want to use. If an adapter does not exist, the Adapter pane displays the word Empty.
3. In the Interface pane, select the correct interface. Click **Settings**.
4. Select **Using a proxy**.
5. Click **OK** to close the Settings dialog.

Relevant CLI Syntax to Configure Adapter Proxy Settings

```
SGOS#(config) interface fast-ethernet interface_#
```

Transparent Proxies

A transparent proxy can be can be configured several ways:

- Through hardware: See “[Configuring Transparent Proxy Hardware](#)” on page 177.
- Through bridging: “[Bridging](#)” on page 178.
- Through using the SG appliance as a gateway: See “[Configuring IP Forwarding](#)” on page 179.

In addition to the transparent proxy configuration, you must create a proxy service for the transparent proxy and enable the service. At this time, you can also set other attributes for the service, including the destination IP address and port range. For information on creating or editing a proxy service for transparent configuration, see [Chapter 3: "About Proxy Services" on page 23](#).

Configuring Transparent Proxy Hardware

For transparent proxy to work, you must use one of the following:

- A bridge, either hardware or software
- Layer-4 switch
- WCCP

Bridging

Network bridging through the SG appliance provides transparent proxy pass-through and failover support. This functionality allows SG appliances to be deployed in environments where L4 switches and WCCP-capable routers are not feasible options.

The SG appliance provides bridging functionality by two methods:

- Software—A software, or *dynamic*, bridge is constructed using a set of installed interfaces. Within each logical bridge, interfaces can be assigned or removed. Note that the adapters must be of the same type. Although the software does not restrict you from configuring bridges with adapters of different types (10/100 or GIGE), the resultant behavior is unpredictable.

To set up a software bridge, refer to *Volume 2: Getting Started*.

- Hardware—The Blue Coat Pass-Through card is a 10/100 dual interface Ethernet device that enables a bridge, using its two adapters, so that packets can be forwarded across it. However, if the system crashes, the Pass-Through card becomes a network: the two Ethernet cables are connected so that traffic can continue to pass through without restriction.

When the Pass-Through card is installed on the SG appliance, a bridge is automatically created and traffic going through the bridge is intercepted according to the proxy-service setting. Note that:

- Forwarding traffic behavior: By default, the bridge forwards packets that are not to be intercepted.
- Proxy request behavior: Requests are proxied on either adapter, so if you connect one side of the bridge to your Internet connection, there might be a number of issues.

Configuring a Layer-4 Switch

In transparent proxy acceleration, as traffic is sent to the origin content server, any traffic sent on port 80 is redirected to the SG appliance by the Layer 4 switch. The benefits to using a Layer 4 switch include:

- Built-in failover protection. In a multi-SG setup, if one appliance fails, the Layer 4 switch can route to the next SG appliance.
- Request partitioning based on IP address instead of on HTTP transparent proxying. (This feature is not available on all Layer 4 switches.)
- SG appliance bypass prevention. You can configure a Layer 4 device to always go through the SG appliance even for requests to a specific IP address.
- SG appliance bypass enabling. You can configure a Layer 4 device to never go through the SG appliance.

For information on configuring a layer-4 switch, refer to the manufacturer's documentation.

Configuring a WCCP-Capable Router

WCCP is a Cisco®-developed protocol that allows you to establish redirection of the traffic that flows through routers.

The main benefits of using WCCP are:

- Scalability—with no reconfiguration overhead, redirected traffic can be automatically distributed to up to 32 SG appliances.

- Redirection safeguards—If no SG appliances are available, redirection stops and the router forwards traffic to the original destination address.

For information on using WCCP with a SG appliance, refer to *Volume 6: Advanced Networking*.

Configuring IP Forwarding

IP Forwarding is a special type of transparent proxy. The SG appliance is configured to act as a gateway and is configured so that if a packet is addressed to the SG adapter, but not its IP address, the packet is forwarded toward the final destination. If IP forwarding is disabled, the packet is rejected as being mis-addressed.

By default, IP forwarding is disabled to maintain a secure network.

Important: When IP forwarding is enabled, be aware that all SG ports are open and all the traffic coming through them is not subjected to policy, with the exception of the ports that have explicitly defined through the **Configuration > Services > Proxy Services** tab.

To enable IP forwarding:

1. Select **Configuration > Network > Routing > Gateways**.
2. Select the **Enable IP forwarding** checkbox.
3. Click OK; click **Apply**.

Related CLI Syntax to Enable IP Forwarding

```
SGOS#(config) tcp-ip ip-forwarding enable
```


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