Forcepoint IPsec Advanced

Configuration Guide
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Introduction

IPsec Advanced is Forcepoint’s next generation IPsec service, based on Forcepoint’s NGFW technology. IPsec Advanced is used to forward traffic securely from your network’s edge devices to the cloud service over a virtual private network (VPN). This guide covers the Forcepoint Advanced IPsec solution, introduced in July 2019, and provides information on planning and deploying IPsec for your network.

Important
This guide covers the Forcepoint Advanced IPsec solution, launched in July 2019. IPsec Advanced is the platform for which future features will be developed, and supports wide device interoperability, and devices with dynamic IP addresses using pre-shared key authentication.

Customers who established tunnels via the Forcepoint IPsec service prior to this date may still use the legacy IPsec service. Customers using the legacy service will be migrated over a period of time to Forcepoint IPsec Advanced. For information about using the legacy IPsec solution, see Connecting to the legacy IPsec solution in the Forcepoint Knowledge Base.

Introduction to Forcepoint IPsec Advanced

Internet Protocol Security (IPsec) is an extension to the IP protocol that provides secure traffic tunneling by authenticating and encrypting information sent over a network. The IPsec protocol uses Internet Key Exchange (IKE) to establish session keys for encryption and decryption, and Encapsulating Security Payload (ESP) to provide data confidentiality and integrity. Traffic to the Forcepoint IPsec Advanced service can be fully encapsulated in tunnel mode, providing complete traffic encryption.

Forcepoint IPsec Advanced supports transparent end user identification via NTLM, allowing users to browse the Internet without explicitly providing logon credentials.
Typical uses for the IPsec Advanced service include providing Forcepoint Web Security Cloud protection for:

- Remote offices
- Guest Wi-Fi networks
- Organizations that want to secure traffic sent to the cloud service
- Organizations that have dynamic egress IPs
- Organizations that do not want a Group Policy Object (GPO) or browser configuration
- Organizations that are unable to or do not want to install an endpoint on client machines
- Organizations with a “bring your own device” policy.

A typical site-to-site IPsec tunneling deployment is shown in the following diagram.

**Benefits**

Using IPsec Advanced to forward traffic to the cloud service can provide a number of benefits. These include:

- There is no need to install endpoint software on client machines or deploy browser configuration PAC files through Group Policy Objects - ideal for BYOD or guest networks.
Introduction

- Traffic inside the tunnel can be protected via encryption
- Your network’s internal IP addresses are available to the cloud service, so:
  - Policies can be created based on internal IP addresses, address ranges, or subnets
  - Authentication bypass can be set based on IP addresses, address ranges, or subnets
  - Reports can be created using internal IP addresses to identify individual users.

Capacity planning

Forcepoint IPsec Advanced supports up to 20k connections and 200Mbps per tunnel. To scale beyond this, you will need to split traffic between multiple IPsec tunnels. For example:

- If your requirement is for 10k connections and 500Mbps, you will need 3 tunnels
- If your requirement is for 35k connections and 25Mbps, you will need 2 tunnels.

Supported devices

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Forcepoint IPsec Advanced is a standards-based service. Any edge device that supports our recommended configuration settings, and can forward port 80 and 443 traffic to the tunnel, can be used to forward traffic to the service. See Recommended settings and best practices, page 15.

For the latest list of devices that have been tested and accredited for use with the Forcepoint IPsec Advanced service, see the knowledge base article IPsec Advanced supported devices.

Forcepoint recommends using the latest firmware for your device.

Supported standards

Forcepoint Web Security Cloud is compliant with the following drafts of Internet Key Exchange:

- IKEv1 – RFC 2409/4109 (November 1998/May 2005)
- IKEv2 – RFC 7296 (October 2014)
Configuration process

This section details the end-to-end configuration process for setting up your device for IPsec Advanced connectivity.

First steps

You will need either the public IP address, or DNS hostname of the device, to use as the IKE ID:

- Use the public (egress) IP address of the edge device as the IKE ID if the public IP address is static.
- Use the DNS hostname (FQDN) of the device, with IKEv2, if your device has a dynamic IP address.

If you are a hybrid customer, contact Technical Support to obtain a login to the cloud portal. See Using IPsec with the hybrid service, page 13.

The configuration process is covered step-by-step in Tunnel configuration, page 5.

See Recommended settings and best practices, page 15 for details of the recommended and supported device configuration settings for IPsec Advanced. The section also details device configuration best practices.

Tunnel configuration

The basic steps to configure IPsec Advanced tunneling to the cloud service are as follows.

Note: by default, you can create 2 tunnel connections for your account. To add more connections, contact your sales account manager to discuss your requirements.

2. On your device, create a connection profile for your tunnel, using the supported settings documented in Recommended settings and best practices, page 15.

The following generic steps are required for any supported device:

a. Create an IKE proposal (IKEv2 is recommended).

b. Create an IPsec proposal (AES-GCM algorithm is recommended).

c. For authentication, configure the pre-shared key configured in the Security Portal.

d. For the IKE ID, use the egress IP address, or DNS hostname of the device, as selected in the Security Portal.

e. Add a policy or filters to route port 80 and 443 traffic to the tunnel.

f. Set up an IKE gateway, specifying the Forcepoint data center IP address, as selected in the Security Portal. IP addresses for IPsec Advanced are listed in the article IP addresses for GRE and IPsec Advanced connectivity.

g. Ensure you configure your device for geographic redundancy, using both the primary and secondary tunnel addresses. See Redundancy and failover, page 6.

3. If required, configure NAT exemptions to ensure that network address translation is not applied to traffic from client networks that is to be routed through the tunnel.

4. Browse to the proxy query URL to make sure that the appropriate policy is being applied to your tunnel. (Also see Test your policies, page 12.)

The query URL is:

http://query.webdefence.global.blackspider.com/?with=all

Redundancy and failover

For each device you configure in the Security Portal, two Forcepoint data centers can be selected. Forcepoint strongly recommends configuring your device to achieve geographic redundancy using both data center addresses.

Important

Connection redundancy is a requirement for the Forcepoint Web Security Cloud SLA

You can achieve geographic redundancy by either:
Configuration process

- Configuring primary and secondary tunnels, and using the connectivity monitoring address to monitor the status of the primary tunnel, with automatic failover to the secondary tunnel, or
- Configuring the two data center addresses as multiple IPsec peers for the same tunnel.

Use the appropriate IP addresses for your selected data centers. These are listed in the article IP addresses for GRE and IPsec Advanced connectivity.

To decide which data centers are best for your environment, consider:

- Which data centers are nearest
- Any geographical or data sovereignty concerns around where users browse or where their reporting data is stored

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**Note**

Failover behavior, particularly cross-data-center failover, could change an end user’s browsing experience. For example, some sites may change localization or presentation between a UK data center and a German data center (for example, www.google.co.uk might automatically redirect to www.google.de or www.google.nl, depending on which data center users’ traffic is directed through).

Bear in mind that inter-data-center failover should be an exceptional occurrence, so this behavior might be acceptable in emergency circumstances.
Configuration process
Next steps

Once you have completed the setup steps in the preceding section, your next steps are to:

- **Enable notification pages for HTTPS sites** (if required)
- **Set up end-user authentication** (if required)
- **Configure browsers for NTLM identification** (if required)
- Ensure you have configured policies to manage traffic from your network. See Forcepoint Web Security Cloud Help - Defining Web Policies for information on policy configuration.
- **Test your policies.**

Enable notification pages for HTTPS sites

In order for notification pages to be displayed for HTTPS sites - for example, block pages if the website is in a category that is blocked, or the Pre-logon welcome page for authentication - you must configure a root certificate on each client machine. This acts as a Certificate Authority for secure requests to the cloud proxy.

The setting is found on the **Web > Block & Notification Pages** page, under Settings. To enable it, select the checkbox **Use certificate to serve notifications for HTTPS pages**.

This page also has a link to download the Forcepoint root certificate, which should be installed on client machines. For further details, see Forcepoint Web Security Cloud Help - Configure Block & Notification Pages.

Set up end-user authentication

End-user authentication is driven by the setting configured in your Web policy. For IPsec Advanced traffic, the cloud service can perform either NTLM identification or manual authentication. NTLM identification uses the credentials presented by a user’s browser, and compares these to the user details you have synchronized with the cloud.
service in order to identify the user. Manual authentication requires users to log on before they can browse, using the email address and password registered with the cloud service.

The following graphic shows the **Access Control** tab in the Forcepoint Security Portal, used to define your authentication settings.

By default, manual authentication is enabled. If the **Always authenticate users on first access** option is set, users are prompted to authenticate when first logging on.

If NTLM identification is enabled, it is given priority and will be used instead of manual authentication. In order for NTLM identification to work seamlessly, you must synchronize end user information including NTLM IDs with the cloud service. (See [Forcepoint Security Portal Help - Directory Synchronization](#)). If a user cannot be identified via NTLM, the service defaults to manual authentication.

For further information on setting up end-user authentication, see [Forcepoint Web Security Cloud Help - Access Control tab](#).

**Note**

Currently, single sign-on, the endpoint client, and secure form-based authentication are not supported for use with Forcepoint IPsec. See *Limitations, page 17.*
Authentication bypass

Both cloud and hybrid administrators can elect to bypass authentication based on internal IP addresses, ranges, or subnets. Forcepoint Technical Support must enable the Internal Bypass Rules for Edge Devices feature for your account. See Forcepoint Web Security Cloud Help - Bypassing authentication settings for more information.

Configure browsers for NTLM identification

NTLM identification also requires that you add the authentication URLs for the Forcepoint cloud service to your browsers’ local intranet zone.

The following URLs must be trusted:

http://proxy-login.blackspider.com
https://ssl-proxy-login.blackspider.com

For guidance on adding these URLs for various browsers, see the following article in the Forcepoint Knowledge Base: Configuring browsers for NTLM identification.
Test your policies

Your policies can be tested using the proxy query page:

http://query.webdefence.global.blackspider.com/?with=all

Verify that traffic is going through the cloud service and that the correct policies are being applied. The following graphic shows the result of a successful test.

Confirmation Page

☑ Yes, you are using the Filtering Proxy Server

Server Information

Version 7.9.50787.265
Hostname pc32gsrv.mailcontrol.com

Policy chain

Customer name Policy name
Shows your account and policy information

Connection information

Your external IP address
Proxy 1.1 hosted websense 32g

HTTP headers

via 1.1 hosted.websense 32g
accept-language en-US,en;q=0.5
accept-encoding gzip, deflate
x-forwarded-for 204.15.64.187
accept text/html,application/xhtml+xml,application/xml;q=0.9,*/*;q=0.8
user-agent Mozilla/5.0 (Windows NT 6.1; WOW64; rv:38.0) Gecko/20100101 Firefox/38.0
host query.webdefence.global.blackspider.com
client-ip
If you are using Forcepoint Web Security Cloud with the hybrid service, the following additional steps are required:

- If you do not have a cloud portal account, contact Forcepoint Technical Support to add your edge device details in the cloud before setting up your device.
- Special Sync Service configuration is required. See IP-based policy enforcement in hybrid deployments, page 13.
- If you have installed the Forcepoint root certificate and wish to see notification pages, in the Forcepoint Security Manager, navigate to Web > Settings > Hybrid Configuration > User Access > HTTPS Notification Pages, and mark the Use the hybrid SSL certificate... checkbox. This ensures that notification pages (such as block pages) are displayed for HTTPS requests.

### IP-based policy enforcement in hybrid deployments

In order to use IP address-based policies for users whose requests go through the hybrid service, a configuration-based change is required on the Sync Service machine.

1. Log on to the Sync Service machine with Administrator privileges.
2. Navigate to the Websense\bin directory:
   - Linux:
     `/opt/Websense/bin`
   - Windows:
     `c:\Program Files\Websense\Web Security\bin`
Using IPsec with the hybrid service

or

c:\Program Files (x86)\Websense\Web Security\bin

3. Open the **SyncService.ini** file in a text editor.

4. Add the following line under the “SyncServiceHTTPPort” entry:

   ```ini
   OptimizePolicyExtract=False
   ```

   When you are finished, the file will look something like this:

   ```ini
   [service]
   SyncServiceHTTPAddress = <ip_address>
   SyncServiceHTTPPort = 55832
   OptimizePolicyExtract=False
   ```

5. Save and close the file.

6. Use the Windows Services tool or the `/opt/Websense/WebsenseDaemonControl` command to restart Sync Service.
Recommended settings and best practices

The following tunnel negotiation and encryption settings are supported for IPsec Advanced. Recommended settings are shown in **bold**.

<table>
<thead>
<tr>
<th>Setting</th>
<th>Supported (recommended settings in bold)</th>
</tr>
</thead>
<tbody>
<tr>
<td>IKE version</td>
<td>IKEv2</td>
</tr>
<tr>
<td></td>
<td>IKEv1</td>
</tr>
<tr>
<td>IKE cipher</td>
<td>AES-128</td>
</tr>
<tr>
<td></td>
<td>AES-256</td>
</tr>
<tr>
<td>IKE message digest</td>
<td>SHA2</td>
</tr>
<tr>
<td></td>
<td>SHA1</td>
</tr>
<tr>
<td>DH groups</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>19</td>
</tr>
<tr>
<td></td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>5</td>
</tr>
<tr>
<td>IPsec type</td>
<td>ESP</td>
</tr>
<tr>
<td>IPsec cipher</td>
<td>AES-GCM-128</td>
</tr>
<tr>
<td></td>
<td>AES-GCM-256</td>
</tr>
<tr>
<td></td>
<td>AES-128</td>
</tr>
<tr>
<td></td>
<td>AES-256</td>
</tr>
<tr>
<td></td>
<td>Null</td>
</tr>
<tr>
<td>IPsec message digest</td>
<td>SHA2</td>
</tr>
<tr>
<td></td>
<td>SHA1</td>
</tr>
<tr>
<td>Authentication method</td>
<td>PSK only</td>
</tr>
<tr>
<td>IKE lifetime</td>
<td>24 hours</td>
</tr>
<tr>
<td>IPsec lifetime</td>
<td>8 hours</td>
</tr>
<tr>
<td>Perfect Forward Secrecy (PFS)</td>
<td>No</td>
</tr>
</tbody>
</table>
Forcepoint recommends the following best practices when configuring your IPsec solution:

- For devices with dynamic IP addresses, you must use IKEv2, using the DNS hostname as the IKE ID.
- Traffic routing: Forcepoint IPsec Advanced supports web traffic only (HTTP and HTTPS). Other traffic, such as SMTP and FTP, must be routed outside of the tunnel, directly to the relevant destination.
- If your IPsec edge device is behind another device in your network that is performing network address translation (NAT), NAT-traversal (NAT-T) must be enabled on your IPsec edge device.

**Maximum Segment Size**

The encapsulation overhead of the IPsec Advanced tunnel means that TCP sessions sent over the tunnel must be limited to a lower Maximum Segment Size (MSS) than usual. Most TCP clients will propose an MSS value of 1460 bytes when connecting over an Ethernet network.

Forcepoint recommends setting an MSS value of no more than 1360 bytes in order to leave overhead for IPsec encapsulation. This can often be achieved by using the MSS clamping feature of a firewall or router, to ensure that any TCP traffic sent down the tunnel is limited to an MSS value of 1360.

Where the WAN connection to Forcepoint’s data centers is using the IPoE or PPPoE protocol, the MSS value may need to be lower still, to account for the encapsulation overhead of the WAN connection.

To display the current MSS setting for your tunnel interface, use the appropriate “show interface” command on your edge device.

**Google QUIC protocol**

As a best practice, Forcepoint recommends adding a firewall rule to block UDP on port 443. This prevents Google Chrome browsers from accessing Google services directly via the experimental QUIC protocol. For further information, see the knowledge base article Google QUIC protocol is not supported by the Forcepoint cloud service.
Limitations

The following items are known limitations of the Forcepoint IPsec Advanced solution.

- Certificate authentication is not currently supported for IPsec Advanced.
- Forcepoint’s local point of presence (local PoP) IP addresses are not currently supported with IPsec Advanced.
- Forcepoint Web Security Endpoint is not supported for use with Forcepoint IPsec Advanced.
- Secure form-based authentication is not supported for use with Forcepoint IPsec Advanced.
- To support PAC file enforcement, you must use the alternate (port 80/443) PAC file address. The standard PAC file address (using port 8082/8087) is not supported.
- Using an authentication bypass rule to force NTLM, basic authentication, or the welcome page does not work with IPsec Advanced tunneling if a URL destination is configured.
- Basic authentication does not work for iTunes with IPsec Advanced tunneling.
- Windows XP support: SSL decryption and scanning of HTTPS traffic for Internet Explorer on Windows XP is not possible, since it does not support Server Name Indication (SNI). SNI is required for HTTPS decryption, to extract the destination hostname and create a decryption certificate.
- Dropbox is not supported for use with the Protected Cloud Apps feature in Forcepoint Web Security Cloud with IPsec Advanced.
- Some web pages may not load properly in Safari after successful user authentication. Ensure the *Block cookies* option is set to Never in Safari’s privacy preferences.
End-user client requirements

Forcepoint IPsec Advanced has the following requirements for Internet Explorer and Safari:

- Internet Explorer: version 7 and above is required. Versions earlier than this do not support SNI, which is required by Forcepoint IPsec.
- Safari: if the customer policy has authentication enabled, Safari users must change the **Block cookies** setting to **Never** to ensure web pages load properly:
The following table lists some problems that may be encountered in configuring and establishing your tunnel, with some suggested actions.

<table>
<thead>
<tr>
<th>Problem</th>
<th>Suggested actions</th>
</tr>
</thead>
</table>
| Your tunnel cannot be established                 | Use the appropriate `show` command for your device to display the tunnel status. If the tunnel is down, check the settings for your tunnel against the recommended settings detailed in the article [IPsec configuration settings](#). Check that the following items have been correctly configured in your device’s connection profile:  
  - Connection IP address  
  - Pre-shared key  
  - IKE protocol  
  - IKE cipher  
  - IKE ID  
  - IKE ID DH group  
  - IPsec encryption algorithm  
  In the Security Portal, check that the device’s egress IP is configured correctly. |
| Your tunnel is up, but traffic is not flowing through the tunnel | Use the appropriate `show` command for your device to display the tunnel status. If the tunnel is up:  
  - Verify that the tunnel connectivity monitoring address (116.50.59.230) can be pinged via the tunnel.  
  - Check that the IPsec policy is configured to allow port 80 and 443 traffic through the tunnel.  
  - If the edge device supports issuing an HTTP request via a utility such as curl or Wget, check that you can successfully receive an HTTP response from the proxy.  
  - Capture traffic on the edge device and check if the traffic is being routed through the tunnel. |
## Troubleshooting

<table>
<thead>
<tr>
<th>Problem</th>
<th>Suggested actions</th>
</tr>
</thead>
</table>
| Your device has previously connected, but cannot re-establish the tunnel | Check the settings for your tunnel against the recommended settings detailed in *Recommended settings and best practices*, page 15.  
In particular, check you are using supported DH group settings. When incorrectly set, these settings can cause problems at the renegotiation stage.  
Clear the IPsec security associations on your device, and attempt to re-establish the tunnel.  
Tip: while testing, temporarily set the Lifetime value for your connection to a low value (such as 10 minutes) to check whether the tunnel can successfully re-establish. Once the tunnel is re-establishing correctly, revert the lifetime to the recommended value. |
| Your tunnel has successfully established, but your policy settings are not being applied | Use the proxy query page to identify which policy is being applied. If necessary, revisit your policy settings.  
See *Test your policies*, page 12. |
| The policy test page is showing the correct policy, but some HTTPS connections are being closed. (HTTP requests are working.) | Ensure you have checked the **Use certificate to serve notifications for HTTPS pages** in the cloud portal, on the *Web > Block & Notification Pages* page, under Settings.  
See *Enable notification pages for HTTPS sites*, page 9. |
| End users see authentication popups when browsing; NTLM identification is not working | Use the proxy query page to identify which policy is being applied. If necessary, revisit your policy settings.  
See *Test your policies*, page 12.  
Check your NTLM settings. See *Set up end-user authentication*, page 9 and *Configure browsers for NTLM identification*, page 11.  
Ensure that your directory synchronization has successfully imported users and groups. |
| Block pages are not displaying for HTTPS sites                          | Ensure you have checked the **Use certificate to serve notifications for HTTPS pages** in the cloud portal, on the *Web > Block & Notification Pages* page, under Settings.  
See *Enable notification pages for HTTPS sites*, page 9. |

If you continue to have issues after checking all the items above, please contact Technical Support.

## Troubleshooting with HAR files

To help diagnose network issues, you can generate a .HAR (HTTP Archive) file to log your browser’s interaction with a particular website. HAR files can be generated using Google Chrome’s Developer Tools, as well as other software packages.