

## How to Configure a Site-to-Site IPsec IKEv2 VPN Tunnel

<https://campus.barracuda.com/doc/73719174/>

The Barracuda CloudGen Firewall can establish IPsec VPN tunnels to any standard compliant IKEv2 IPsec VPN gateway. The site-to-site IPsec VPN tunnel must be configured with identical settings on both the firewall and the third-party IKEv2 IPsec gateway.



### Before You Begin

If not already present, configure the **Default Server Certificate** in **CONFIGURATION > Configuration Tree > Box > Virtual Server > your virtual server > Assigned Services > VPN > VPN Settings**. For more information, see [VPN Settings](#)

### Step 1. Configure the VPN Service Listeners

Configure the IPv4 and IPv6 listener addresses for the VPN service.

1. Go to **CONFIGURATION > Configuration Tree > Box > Virtual Server > your virtual server > Assigned Services > VPN > Service Properties**.
2. Click **Lock**.
3. From the **Service Availability** list, select the source for the IPv4 listeners:
  - **First+Second-IP** – The VPN service listens on the first and second virtual server IPv4 address.
  - **First-IP** – The VPN service listens on the first virtual server IPv4 address.
  - **Second-IP** – The VPN service listens on the second virtual server IPv4 address.
  - **Explicit** – For each IP address, click + and enter the IPv4 Addresses in the **Explicit Service IPs** list.
4. Click + to add an entry to the **Explicit IPv6 Service IPs**.
5. Select an IPv6 listener from the list of configured explicit IPv6 virtual server IP addresses.

**Service IPs**

Service Availability: Explicit

Explicit Service IPs

62.99.0.40
194.93.0.10
10.20.0.3
10.0.10.3

Explicit Service IPv6s

ip6serv2 ( 2001:db8:1::10 )
ip6serv3 ( 2001:db8:1::20 )
ip6serv4 ( 2001:db8:1::30 )

6. Click **Send Changes** and **Activate**.

## Step 2. Create an IKEv2 IPsec Tunnel on the CloudGen Firewall

1. Go to **CONFIGURATION > Configuration Tree > Box > Virtual Servers > your virtual server > Assigned Services > VPN-Service > Site to Site**.
2. Click the **IPsec IKEv2 Tunnels** tab.
3. Click **Lock**.
4. Right-click the table and select **New IKEv2 Tunnel**. The **IKEv2 Tunnel** window opens.
5. Enter a **Tunnel Name**.
6. Set **Initiates Tunnel**:
  - **Yes** - The firewall is the active unit and continuously attempts to connect to the remote VPN gateway until a VPN tunnel is established.
  - **No** - The firewall is the passive unit and waits for connection attempts from the remote VPN gateway.
7. Set **Restart SA on Close**:
  - **Yes** - Restart the connection if the tunnel terminates unexpectedly.
  - **No** - Close the VPN connection if the tunnel terminates unexpectedly.

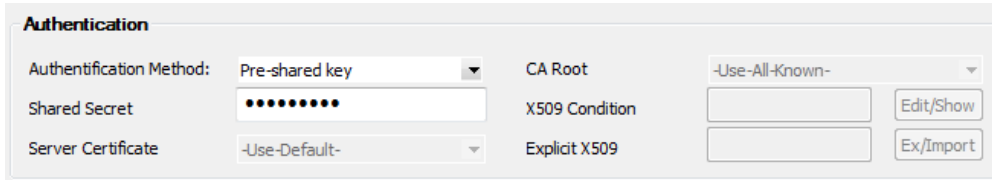
**General**

Tunnel name	<input type="text" value="ExampleIKEv2Tunnel"/>	Initiates tunnel	<input checked="" type="radio"/> Yes	<input type="radio"/> No
Enabled	<input checked="" type="radio"/> Yes	Restart SA on Close	<input checked="" type="radio"/> Yes	<input type="radio"/> No

The combination of **Restart SA on Close** and **IKE Reauthentication** is not supported. This configuration needs to be avoided on both sides of the tunnel to achieve a stable connection.

8. Select the **Authentication Method**:
  - **Pre-shared key** - Enter the **Shared Secret** to use a shared passphrase to authenticate. The shared secret can consist of small and capital characters, numbers, and non alpha-numeric symbols, except the hash sign (#).
  - **CA certificate** - Select a **Server Certificate**, **CA Root** certificate, and enter a **X509 Condition** to use certificate authentication.

- o **X509 certificate (explicit)** – Select a **Server Certificate** and import an **Explicit X509** certificate.

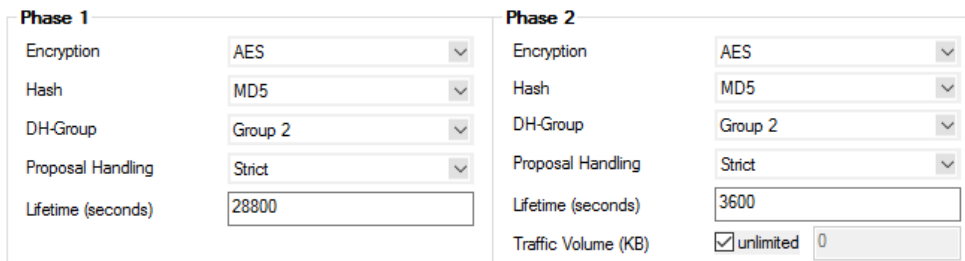


9. Select the **Phase 1** settings:

- o **Encryption** – Select the encryption algorithm: **AES, 3DES, Blowfish, or AES256.**
- o **Hash** – Select the hashing algorithm: **MD5, SHA, SHA256, or SHA512.**
- o **DH-Group** – Select the Diffie-Hellman Group. Supported groups are: 1, 2, 5, 14 - 30.
- o **Proposal Handling**
  - **Strict** – The effective encryption is strictly determined by the proposed set of **Encryption, Hash and Group**. The communication partner must agree with the proposed set; otherwise, no communication will be established due to a missing common encryption agreement.
  - **Negotiate** – This option lets a communication partner decrease the strength of the encryption if it cannot support the proposed encryption from the initiator.
- o **Lifetime (seconds)** – Enter the number of seconds until the IPsec SA is re-keyed.  
Default: 28800

10. Select the **Phase 2** settings:

- o **Encryption** – Select the encryption algorithm: **AES, 3DES, Blowfish, or AES256.**
- o **Hash** – Select the hashing algorithm: **MD5, SHA, SHA256, or SHA512.**
- o **DH-Group** – Select the Diffie-Hellman Group. Supported groups are: 1, 2, 5, 14 - 30.
- o **Proposal Handling**
  - **Strict** – The effective encryption is strictly determined by the proposed set of **Encryption, Hash and Group**. The communication partner must agree with the proposed set; otherwise, no communication will be established due to a missing common encryption agreement.
  - **Negotiate** – This option lets a communication partner decrease the strength of the encryption if it cannot support the proposed encryption from the initiator.
- o **Lifetime (seconds)** – Enter the number of seconds until the IPsec SA is re-keyed.  
Default: 3600.
- o **Lifetime (KB)** – Enter the number of KB after which the IPsec SA is re-keyed.



11. Select the IP Version of the local listener and the remote gateway.

- o **IP Version** – Click **IPv4** or **IPv6** to match the **Local Gateway** and **Remote Gateway IP** address IP versions.

**Network Settings**

IP Version  IPv4  IPv6

One VPN Tunnel per Subnet Pair  Force UDP Encapsulation Next Hop Routing

Universal Traffic Selectors  IKE Reauthentication Interface Index

## 12. (optional) Select **Advanced Network Settings**

- **One VPN Tunnel per Subnet Pair** – Creates a dedicated security association for each subnet pair. This is needed if the remote device is a Cisco ASA.
- **Force UDP Encapsulation** – Use UDP encapsulation (4500) for ESP traffic even if no NAT is detected.
- **Universal Traffic Selector** – Instruct peer to route all traffic into tunnel. This is needed if the remote device is a Checkpoint firewall.
- **IKE Reauthentication** – Reauthenticate during every IKE rekeying. This setting must be disabled if the remote device is a Microsoft Azure Dynamic VPN Gateway.

The combination of **Restart SA on Close** and **IKE Reauthentication** is not supported. This configuration needs to be avoided on both sides of the tunnel to achieve a stable connection.

- **Next Hop Routing** – Sets the next hop IP address for routed VPN traffic.
- **Interface Index** – The number of the virtual interface to be used for routed VPN.

**Network Settings**

IP Version  IPv4  IPv6

One VPN Tunnel per Subnet Pair  Force UDP Encapsulation Next Hop Routing

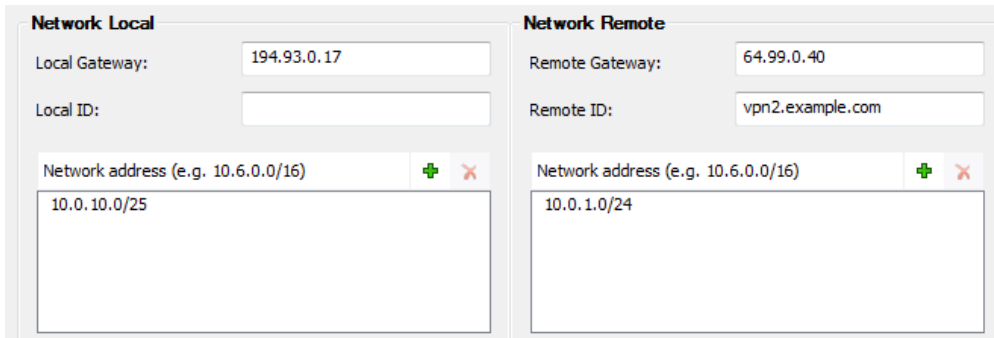
Universal Traffic Selectors  IKE Reauthentication Interface Index

## 13. Enter the **Network Local** settings:

- **Local Gateway** – Enter the external IP address of the firewall. If you are using a dynamic WAN IP address, enter 0.0.0.0.
- **Local ID** – Enter an IP address, FQDN, email, or a distinguished name. If left blank, the local gateway IP is used.
- **Network Address** – Add the local networks you want to reach through the VPN tunnel, and click **Add**.

## 14. Enter the **Network Remote** settings:

- **Remote Gateway** – Depending on the setting of **Initiate Tunnel**, this edit field accepts different input:
  - **Initiate Tunnel = Yes** – The input must be a hostname or IP address. No network IPs in CIDR notation are allowed.
  - **Initiate Tunnel = No** – The input must be an IP address or network address. If the remote appliance is using dynamic IP addresses, enter 0.0.0.0/0.
- **Remote ID** – Enter a unique ID. VPN tunnels without remote ID will not establish successfully.
- **Network Address** – Add the IP address of the remote network, and click **Add**.



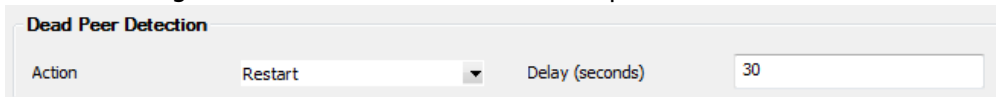
The screenshot shows two panels: 'Network Local' and 'Network Remote'.  
In the 'Network Local' panel:  
- Local Gateway: 194.93.0.17  
- Local ID: (empty)  
- Network address (e.g. 10.6.0.0/16): 10.0.10.0/25  
In the 'Network Remote' panel:  
- Remote Gateway: 64.99.0.40  
- Remote ID: vpn2.example.com  
- Network address (e.g. 10.6.0.0/16): 10.0.1.0/24

15. Enter the **Dead Peer Detection** settings:

○ **Action:**

- **None** – Disable DPD.
- **Clear** – Connection with the dead peer is stopped, routes removed.
- **Hold** – Connection is put in hold state.
- **Restart** – Connection is restarted.

- **Delay (seconds)** – Enter the number of seconds after which an empty INFORMATIONAL message is sent to check if the remote peer is still available.



The screenshot shows the 'Dead Peer Detection' settings:  
- Action: Restart (dropdown menu)  
- Delay (seconds): 30 (input field)

16. Click **OK**.

17. Click **Send Changes and Activate**.

### Step 3. Create an IPsec Tunnel on the Remote Appliance

Configure the remote firewall or third-party VPN gateway with the same settings. Only the local and remote networks and the IP address for the remote VPN gateway must be interchanged.

### Step 4. Create Access Rules for VPN Traffic

To allow traffic in and out of the VPN tunnel, create a **Pass** access rule.

For more information, see [How to Create Access Rules for Site-to-Site VPN Access](#).

### Monitoring a VPN Site-to-Site Tunnel

To verify that the VPN tunnel was initiated successfully and traffic is flowing, go to **VPN > Site-to-Site** or **VPN > Status**.

<a href="#">Site-to-Site</a> <a href="#">Client-to-Site</a> <a href="#">Status</a>		<a href="#">Access Cache</a> <a href="#">Drop Cache</a> <a href="#">Client Downloads</a> <a href="#">Selection</a>												
Tunnel	Name	Type	Group	Info	State	Succ.	Fail	Last Access	Last Peer	Last Info	Last Duration	Last Client	Last OS	Last WSC
IPSEC	v2-AWS2AzureVPNGW				ACTIVE	1031	0	1h 25m 43s	168.63.96.146	Access Granted	1h 25m 43s	Unknown	Unknown	

Go to **LOGS** and select the **/<your\_vpn\_service>/IKEv2** log file

AWSVIRT1\AWSVPN\ikev2 [<new Log>](#)

Select Log File: AWSVIRT1\AWSVPN\ikev2 [Reload Log File Tree](#)

Time	Type	TZ	Message
2015 11 16 09:14:19	16[KNL]	+00:00	<IPSEC-v2-AWS2AzureVPNGW[1]> [del_sa] dstaddr = 168.63.96.146
2015 11 16 09:14:19	16[KNL]	+00:00	<IPSEC-v2-AWS2AzureVPNGW[1]> [del_sa] deleting SPI {112797247} failed: SPI not found
2015 11 16 09:14:19	16[IKE]	+00:00	<IPSEC-v2-AWS2AzureVPNGW[1]> establishing CHILD_SA IPSEC-v2-AWS2AzureVPNGW(2)
2015 11 16 09:14:19	16[KNL]	+00:00	<IPSEC-v2-AWS2AzureVPNGW[1]> getting SPI for reqid {2}
2015 11 16 09:14:19	16[KNL]	+00:00	<IPSEC-v2-AWS2AzureVPNGW[1]> got SPI for reqid {2} = {497813479}
2015 11 16 09:14:19	16[ENC]	+00:00	<IPSEC-v2-AWS2AzureVPNGW[1]> generating CREATE_CHILD_SA request 29 [ SA No KE TSi TSr ]
2015 11 16 09:14:19	16[NET]	+00:00	<IPSEC-v2-AWS2AzureVPNGW[1]> sending packet: from 127.0.0.9[4500] to 168.63.96.146[4500] (332 bytes)
2015 11 16 09:14:19	16[ENC]	+00:00	<IPSEC-v2-AWS2AzureVPNGW[1]> generating INFORMATIONAL response 326 [ D ]
2015 11 16 09:14:19	16[NET]	+00:00	<IPSEC-v2-AWS2AzureVPNGW[1]> sending packet: from 127.0.0.9[4500] to 168.63.96.146[4500] (76 bytes)
2015 11 16 09:14:19	09[NET]	+00:00	<IPSEC-v2-AWS2AzureVPNGW[1]> received packet: from 168.63.96.146[4500] to 127.0.0.9[4500] (348 bytes)
2015 11 16 09:14:19	09[ENC]	+00:00	<IPSEC-v2-AWS2AzureVPNGW[1]> parsed CREATE_CHILD_SA response 29 [ SA No TSi TSr KE ]
2015 11 16 09:14:19	09[KNL]	+00:00	<IPSEC-v2-AWS2AzureVPNGW[1]> [add_sa] ktina_tname = "IPSEC-v2-AWS2AzureVPNGW"
2015 11 16 09:14:19	09[KNL]	+00:00	<IPSEC-v2-AWS2AzureVPNGW[1]> [add_sa] mode = TUNNEL
2015 11 16 09:14:19	09[KNL]	+00:00	<IPSEC-v2-AWS2AzureVPNGW[1]> [add_sa] src = 168.63.96.146:4500, dst = 127.0.0.9:4500
2015 11 16 09:14:19	09[KNL]	+00:00	<IPSEC-v2-AWS2AzureVPNGW[1]> [add_sa] direction = inbound
2015 11 16 09:14:19	09[KNL]	+00:00	<IPSEC-v2-AWS2AzureVPNGW[1]> [add_sa] site2site
2015 11 16 09:14:19	09[KNL]	+00:00	<IPSEC-v2-AWS2AzureVPNGW[1]> [add_sa] updating existing transport
2015 11 16 09:14:19	09[KNL]	+00:00	<IPSEC-v2-AWS2AzureVPNGW[1]> [add_sa] hash name: sha
2015 11 16 09:14:19	09[KNL]	+00:00	<IPSEC-v2-AWS2AzureVPNGW[1]> [add_sa] cipher name: aes
2015 11 16 09:14:19	09[KNL]	+00:00	<IPSEC-v2-AWS2AzureVPNGW[1]> [add_sa] KTINA_IJREQ_SPI_NEW: dir:1 addr:0x92603fa8 spi:497813479
2015 11 16 09:14:19	09[KNL]	+00:00	<IPSEC-v2-AWS2AzureVPNGW[1]> [add_sa] enabled SA: IPSEC-v2-AWS2AzureVPNGW lifetime: 2736 3600
2015 11 16 09:14:19	09[KNL]	+00:00	<IPSEC-v2-AWS2AzureVPNGW[1]> [phion_vpns_send] succeeded

## Figures

1. ipsec\_IKEv2.png
2. vpn\_service\_listeners.png
3. S2S\_IKEv2\_01.png
4. S2S\_IKEv2\_02.png
5. S2S\_IKEv2\_03.png
6. neetwork\_settings\_ipvX.png
7. network\_setting\_others.png
8. S2S\_IKEv2\_04.png
9. S2S\_IKEv2\_05.png
10. S2S\_IKEv2\_monitor.png
11. S2S\_IKEv2\_logfile.png

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