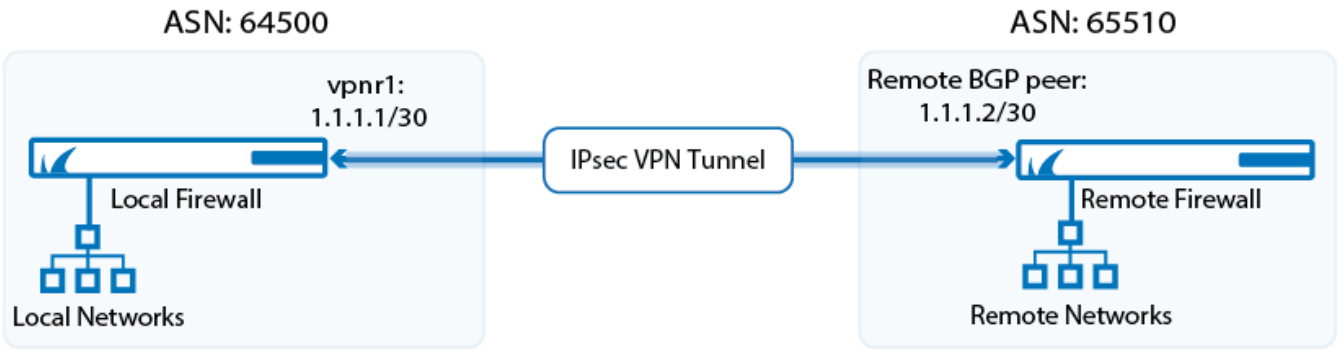
How to Configure BGP over an IKEv1 IPsec VPN to a Third-Party VPN Gateway

https://campus.barracuda.com/doc/79462884/

You can propagate and learn networks via BGP in which the peer is connected via a site-to-site IKEv1 IPsec tunnel. The BGP service uses the IPsec tunnel to dynamically learn the routes of the remote network via the intermediary network /30 assigned to the VPN next hop interface and the remote gateway.



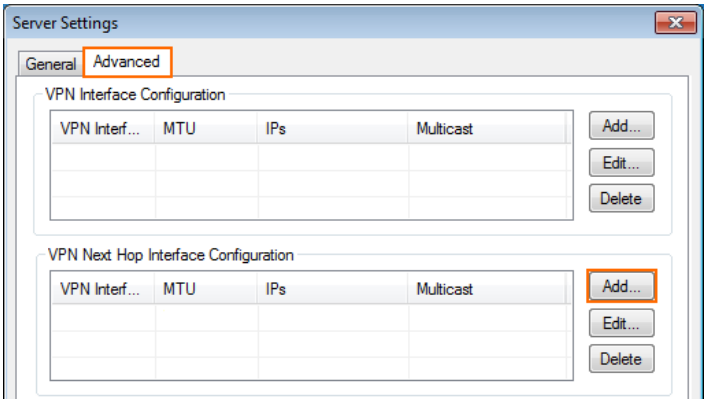
Before You Begin

- You must have a free /30 network.
- You must have or assign autonomous system numbers (ASNs) for the remote and local networks. The ASNs can be private if you are not propagating these networks to other public networks.

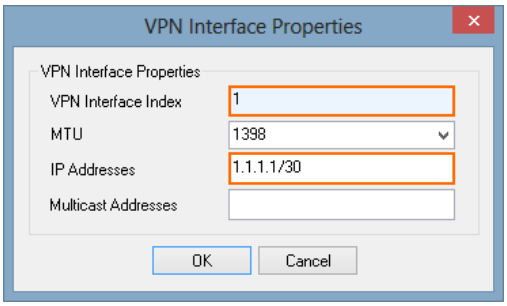
Step 1. Create VPN Next Hop Interfaces

Create a VPN next hop interface and assign an IP address out of the intermediary /30 network.

1. Go to **CONFIGURATION > Configuration Tree > Box > Assigned Services > VPN-Service > VPN Settings** .
2. Click **Lock**.
3. Click **Click here for Server Settings**.
4. Click on the **Advanced** tab.



5. Create a VPN next hop interface for each IPsec tunnel by clicking **Add** in the **VPN Next Hop Interface Configuration** section.
    1. In the **VPN Interface Properties** window, enter:
        - **VPN Interface Index** – Enter a number between 0 and 99. Each interface index number must be unique.
        - **IP Addresses** – Enter the first IP address in the /30 network.
    2. Click **OK**.



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

Step 2. Add the VPN Interface IP to the Shared IP Addresses

Add the IP address of the virtual interface to the list of IP addresses that the service listens on.

1. Go to **CONFIGURATION** > **Configuration Tree** > **Box** > **Network**.
2. In the left menu, select **IP Configuration**.
3. Click **Lock**.
4. In the **Shared Networks and IPs** section, click **+** . The **Shared Network and IPs** window opens.
    1. Select the virtual **Interface**.
    2. In the **Network Address** field, enter the network the virtual interface resides in.
    3. In the **Shared IPs in this Network** table, click **+** and add the intermediary VPN IP address of the local VPN interface. E.g., `1.1.1.1` for the local CloudGen Firewall or `1.1.1.2` for the remote firewall.
    4. Click **OK**.

5. Click **Send Changes** and **Activate**.

Step 3. Configure a Site-to-Site IKEv1 IPsec Tunnel

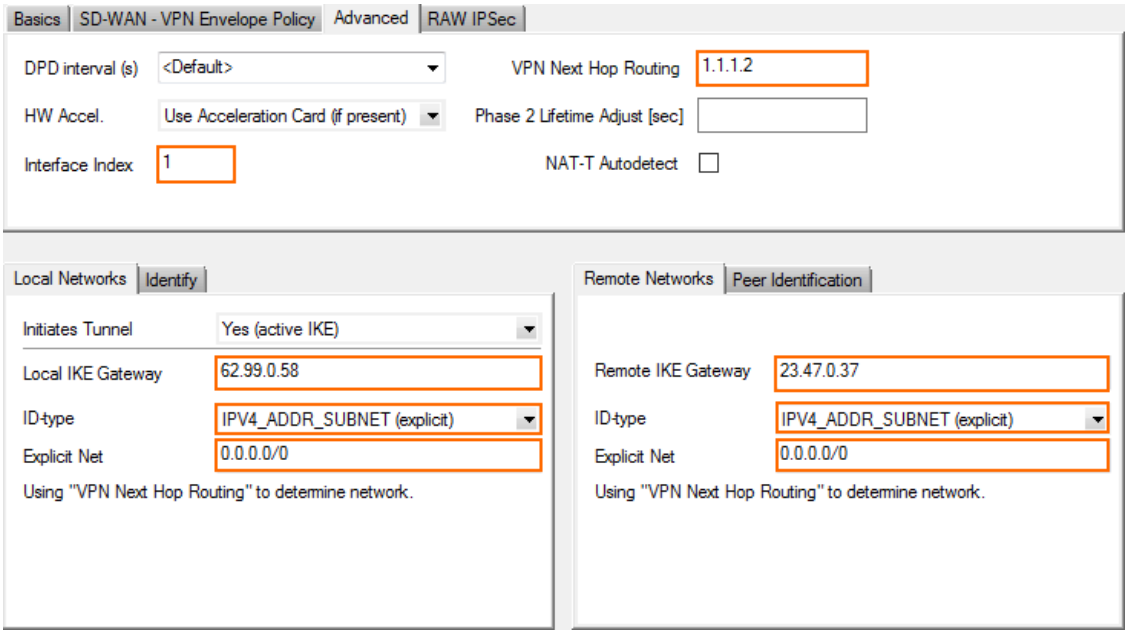
Configure a site-to-site IPsec tunnel using the VPN next hop interface.

1. Go to **CONFIGURATION > Configuration Tree > Box > Assigned Services > VPN-Service > Site to Site** .
2. Click on the **IPSEC IKEv1 Tunnels** tab.
3. Click **Lock**.
4. For each IPsec tunnel, right-click and click **New IPsec IKEv1 tunnel**.
    1. Enter the IPsec tunnel configurations:
        1. Enter a **Name**.
        2. Enter the **Phase 1** and **Phase 2** settings:

	Phase 1	**Phase 2**
Encryption	AES	AES
Hash Meth.	SHA	SHA
DH-Group	Group2	Group 2
Lifetime(sec)	28800	3600
Perfect Forward Secrecy		Enable

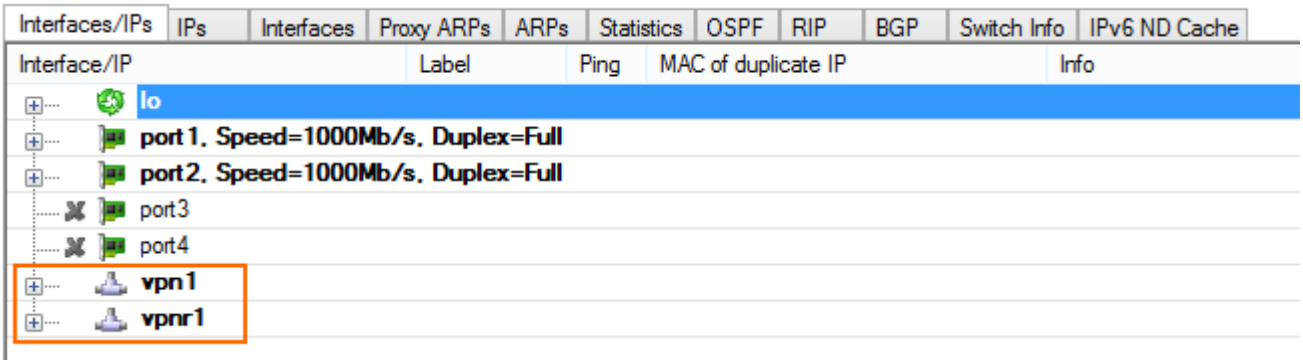
        3. In the **Local Network s** tab:
            - **Local IKE Gateway** – Enter your external IP address. If you are using a dynamic WAN interface, enter `0.0.0.0`
            - **ID-type** – Select **IPV4_ADDR_SUBNET (explicit)**.
            - **Explicit Net** – Enter `0.0.0.0/0`.
        4. In the **Remote Networks** tab:
            - **Remote IKE Gateway** – Enter the public IP address of the remote third-party VPN gateway.
            - **ID-type** – Select **IPV4_ADDR_SUBNET (explicit)**.
            - **Explicit Net** – Enter `0.0.0.0/0`.
        5. In the **Peer Identification** tab:
            - **Shared Secret** – Enter the **Pre-Shared Key**.

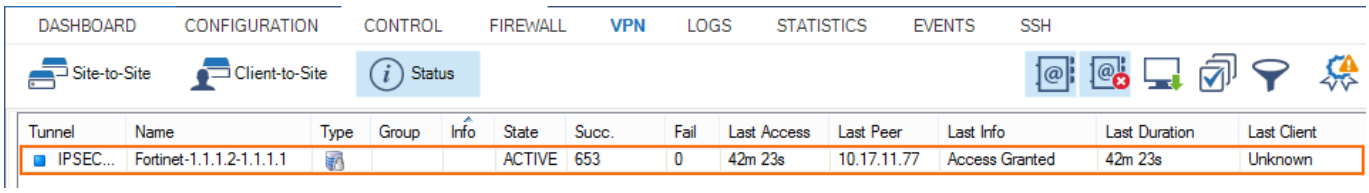
              The shared secret can consist of small and capital characters, numbers, and non-alpha-numeric symbols, except the hash sign (#).
        6. In the **Advanced** tab:
            - **Interface Index** – Enter the **VPN Next Hop Interface index** number you entered in Step 1.
            - **VPN Next Hop Routing** – Enter the second IP address of the /30 network that is assigned to the remove VPN gateway.
        7. Click **OK**.



5. Click **Send Changes** and **Activate**.

You now have one VPN next hop interface listed in the **Interfaces/IPs** section on the **CONTROL > Network** page and the VPN tunnels on the **CONTROL > VPN > STATUS**.





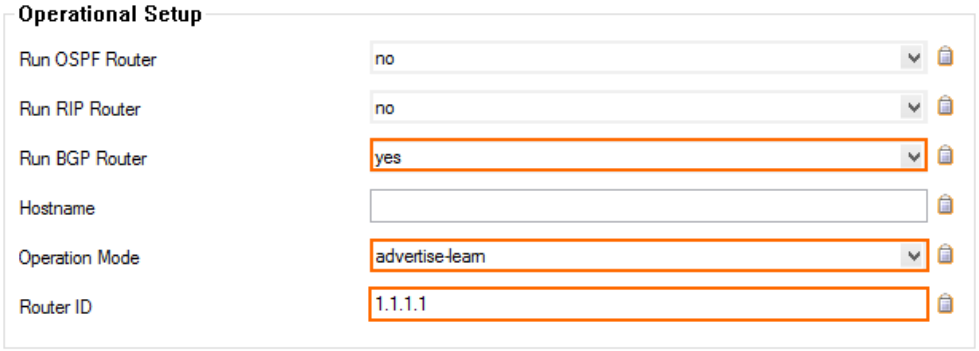
Step 4. Enable BGP and Add BGP Routes

Enable the direct-attached or gateway routes you want to advertise via BGP.

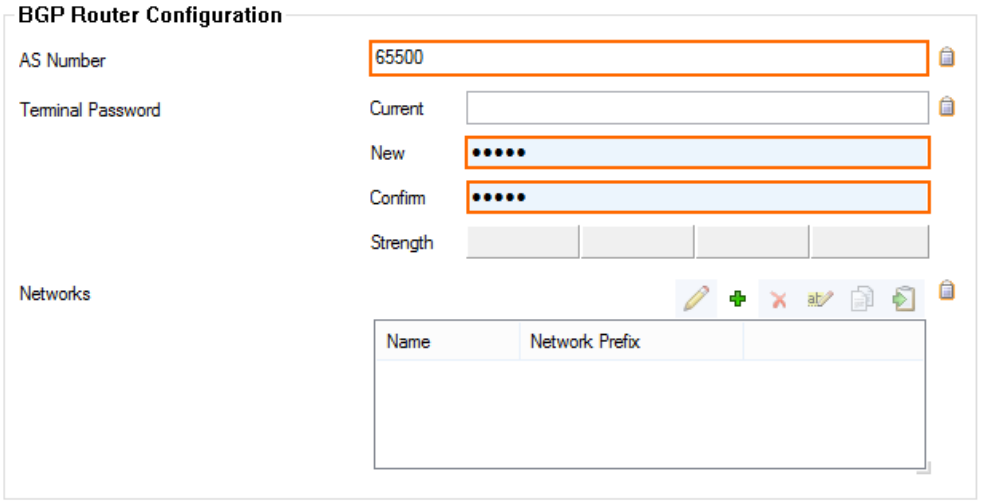
1. Go to **CONFIGURATION > Configuration Tree > Box > Assigned Services > OSPF-RIP-**

BGP-Service > OSPF/RIP/BGP Settings .

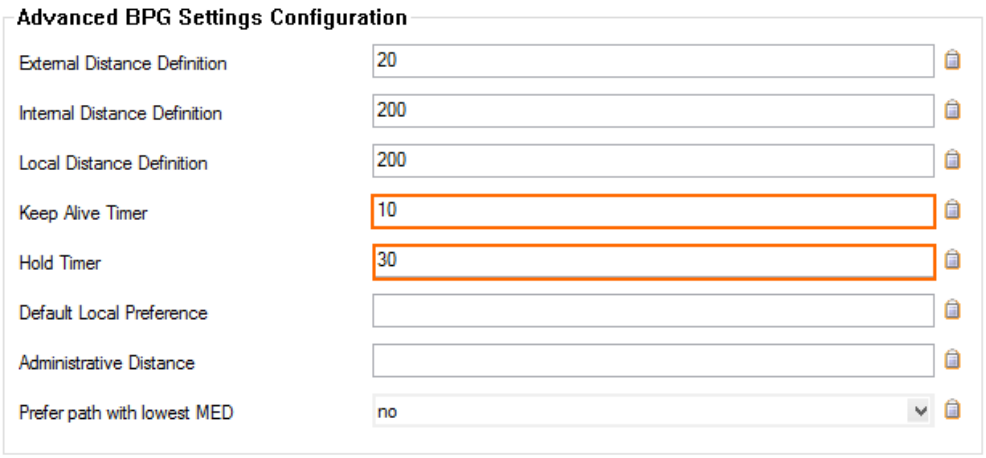
2. Select **yes** from the **Run BGP Router** list.
3. Select **advertise-learn** from the **Operations Mode** list.



4. In the left menu, click **BGP Router Setup**.
5. Enter the **AS Number** (e.g., 65000).
6. Enter the **Terminal Password**.
7. From the **Connected Routes** drop-down list, select **yes**.



8. In the left menu, expand **Configuration Mode** and click **Switch to Advanced Mode**.
9. Click the **Set** button for the **Advanced Settings.** The **Advanced Settings** window opens.
10. Set the **Hold timer** to 30 seconds.
11. Set the **Keep Alive Timer** to 10 seconds.

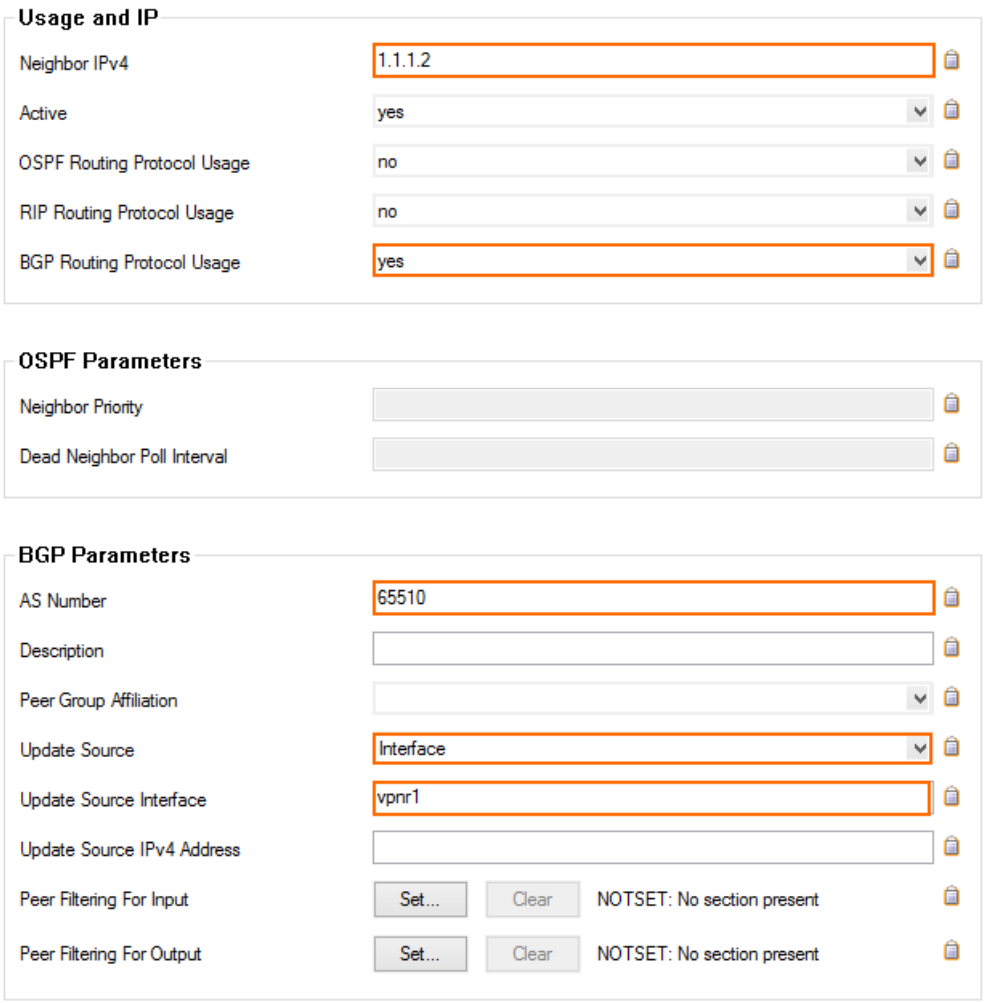


12. Click **OK**.
13. Click **Send Changes** and **Activate**.

Step 5. Add a BGP Neighbor for the Remote Gateway

To dynamically learn the routing of the neighboring network, set up a BGP neighbor for the VPN next hop interface.

1. In the left menu of the **OSPF/RIP/BGP Settings** page, click **Neighbor Setup IPv4**.
2. Click **Lock**.
3. For each IPsec tunnel, click the plus sign (**+**) next to the **Neighbors** table to add a new neighbor.
4. Enter a **Name** for the neighbor**.**
5. In the **Neighbors** window, configure the following settings in the **Usage and IP** section:
   - **Neighbor IPv4** – Enter the second IP address in the /30 network that is assigned to the remote gateway. E.g., `1.1.1.2`
   - **OSPF Routing Protocol Usage** – Select **no**.
   - **RIP Routing Protocol Usage** – Select **no**.
   - **BGP Routing Protocol Usage** – Select **yes**.
6. In the **BGP Parameters** section, configure the following settings:
   - **AS Number** – Enter the ASN for the remote network: E.g., `65510`
   - **Update Source** – Select **Interface**.
   - **Update Source Interface** – Enter the vpnr interface. E..g, `vpnr1`



7. Click **OK**.
8. Click **Send Changes** and **Activate**.

Step 6. Configure Routes to be Advertised via BGP

To propagate a route, set advertise to **yes**, or enter the network as a BGP network manually.

On Box Level

For direct-attached gateway routes and the management network, enable advertising the route in the network configuration.

1. Go to **CONFIGURATION > Configuration Tree > Box > Network** .
2. Click **Lock**.
3. (optional) To propagate the management network, set **Advertise Route** to **yes**.
4. In the left menu, click **Routing**.
5. Double-click on the **Routes** you want to propagate, and set **Advertise Route** to **yes**.

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

Manually BGP Networks

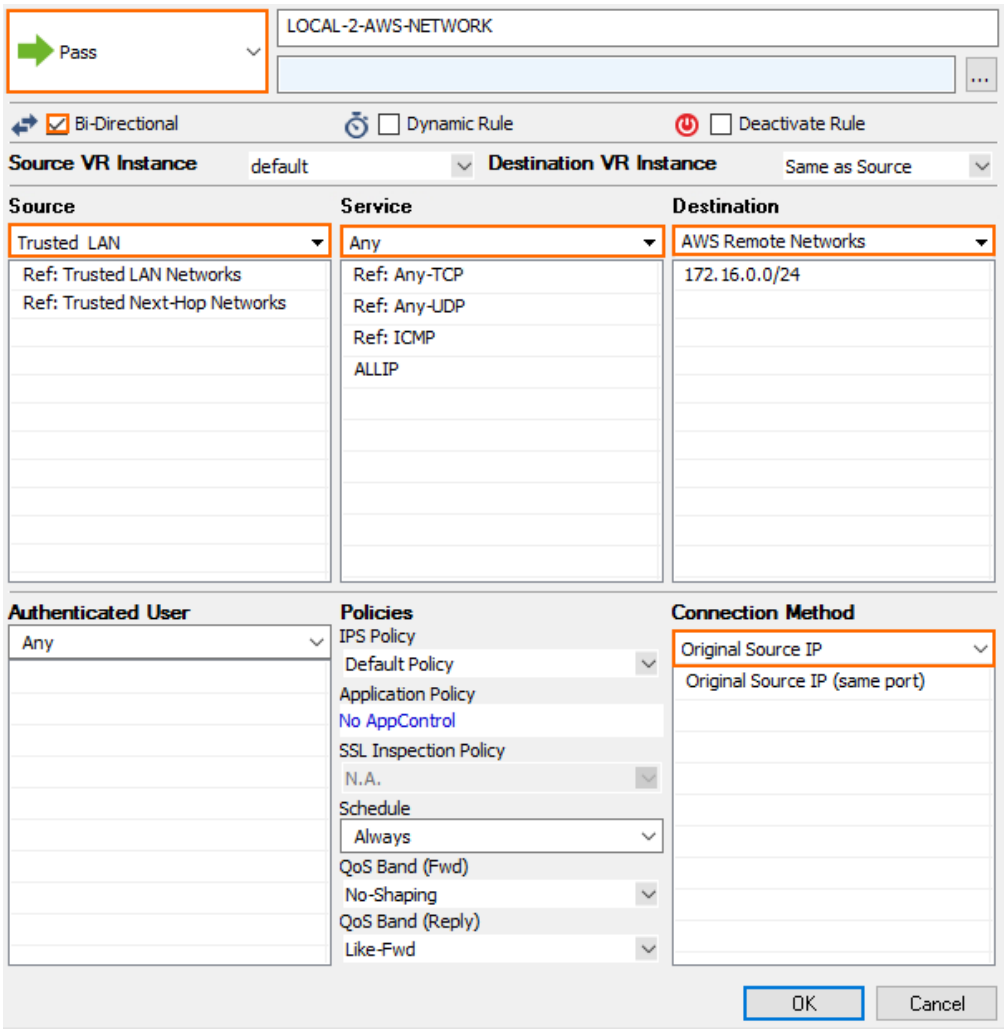
To manually add networks that are advertised to the neighbor, you can also enter them directly as a BGP network.

1. Go to **CONFIGURATION > Configuration Tree > Box > Assigned Services > OSPF-RIP-BGP-Service > OSPF/RIP/BGP Settings** .
2. Click **Lock**.
3. In the left menu, click **BGP Router Setup**.
4. Click **+** to add an entry to the **Networks** list.
5. Enter a **Name**.
6. Click **OK**.
7. Enter the network you want to propagate as the **Network Prefix**.
8. Click **OK**.
9. Click **Send Changes** and **Activate**.

Step 7. Create an Access Rule for VPN Traffic

To allow traffic to and from the VPN networks, a pass access rule is needed.

1. Create a Pass access rule:
   - **Bi-Directional** – Enable.
   - **Source** – Select the local network(s) you are propagating via BGP.
   - **Service** – Select the service you want to have access to the remote network or **ALL** for complete access.
   - **Destination** – Enter the remote networks.
   - **Connection Method** – Select **No Src NAT**.



2. Click **OK**.
3. Move the access rule up in the rule list, so that it is the first rule to match this type of traffic.
4. Click **Send Changes** and **Activate**.

Step 8. Configure your Third-Party VPN Gateway

Contact the vendor of your third-party device for instructions on how to configure the remote site for this setup.

Configure the remote VPN gateway using the same encryption settings and shared key for the IPsec tunnel. Also, configure the BGP service to listen on the second IP address of the /30 network and the CloudGen Firewall as a BGP neighbor. This setup has been tested with the following third-party devices:

Third-Party Device	Test Device Firmware Version*	Link

Fortinet FortiGate 60D	v5.2.1,build618 (GA)	For more information, see Fortinet documentation.

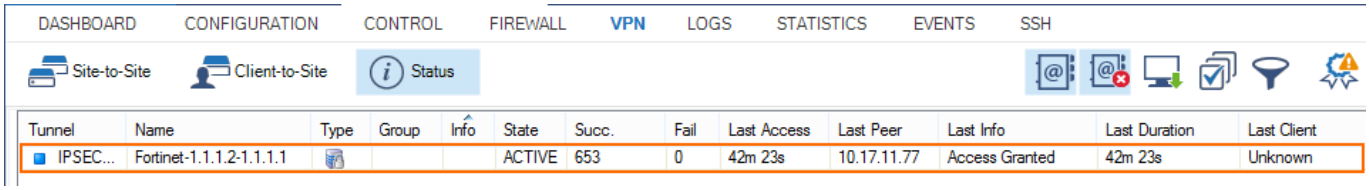
* This firmware has shown to be working in our tests. If you are using a different device or firmware version, your mileage may vary.

Monitoring

You now have an IPsec VPN tunnel connecting your CloudGen Firewalls to a third-party VPN gateway. It may take some time for BGP to learn the new routes.

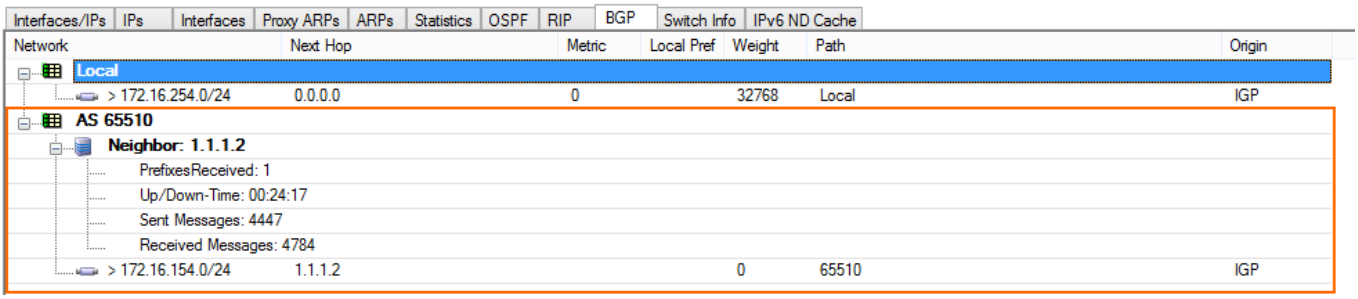
IPsec Tunnel

Go to **VPN > Status** and verify that the IPsec tunnel is **Active**.



BGP

Go to **CONTROL > NETWORK > BGP** and verify that you are connected to the remote BGP neighbor and that networks are learned.



Figures

1. bgp_over_ipsec__thrid_party_vpn.png
2. bgp_ipsec_01.png
3. bgp_ipsec_02.png
4. bgp_ipsec_03.png
5. bgp_ipsec_04.png
6. bgp_ipsec_05.png
7. bgp_ipsec_06.png
8. bgp_ipsec_07.png
9. bgp_ipsec_08.png
10. bgp_ipsec_09.png
11. FW01.png
12. bgp_ipsec_05.png
13. bgp_ipsec_99.png