How to Configure BGP Router Setup with Optional BFD

https://campus.barracuda.com/doc/95258690/

Requirements

- Request your own or use a unique ARIN-registered autonomous system (AS) number for your BGP site.
- Know the AS numbers of BGP sites to be connected.
- Create an OSPF/RIP/BGP service on the Barracuda CloudGen Firewall.

Step 1. Configure Basic Settings

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1. Go to **CONFIGURATION > Configuration Tree > Box > Assigned Services > OSPF-RIP-BGP-Service > OSPF/RIP/BGP Settings**.
2. Enable BGP. (If you are not using OSPF and RIP, disable them.)
3. From the **Operation Mode** drop-down field, select one of the following options according to your requirements:
    - **advertise-only** – Networks are only advertised.
    - **learn-only** – Only networks on the interfaces that are configured for OSPF/RIP/BGP are propagated; learned routes from other systems are still advertised.
    - **advertise-learn** – Networks are learned and propagated.
4. In the **Hostname** field, enter the hostname of the BGP router.
5. In the **Router ID** field, enter the IP address of the BGP router. You can enter any address from your ARIN range. Usually, the first or last IP address in the subnet is used.

    > You must also add this IP address as a shared IP address in **Network > IP Configuration** on the Barracuda CloudGen Firewall, as described later in Step 6 of the configuration.

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

Step 2. Configure Operational Settings

> In the settings for network routes that should be propagated by the BGP router, make sure that you enable the **Advertise Route** setting. See How to Configure Direct Attached Routes or How to Configure Gateway Routes.

1. On the **OSPF/RIP/BGP Settings** page, click **BGP Router Setup** from the **Configuration** menu in the left navigation pane.
2. In the **AS Number** field, enter the AS number that you received from the ARIN. (This is the

number of the autonomous system that the BGP router belongs to.)

3. In the **Terminal Password** field, specify the password for the connection to the BGP routing daemon through the command-line interface.
   > The password can consist of small and capital characters, numbers, and non-alpha-numeric symbols, except the hash sign (#).
4. In the **Networks** table, add an entry for the ARIN network and any other network that you want to advertise.
   1. Enter a name for the network and click **OK**. The **Network** window opens.
   2. In the **Network Prefix** field, enter the network and subnet mask in CIDR notation for the autonomous system of the BGP router.
   3. Click **OK**.
5. In the **Route Distribution Configuration** section, enable the network route types to be redistributed by this BGP router according to your requirements. You can enable the following network routes:
   - **Connected Routes** – Network routes of directly attached networks will be redistributed.
   - **RIP Routes** – Network routes learned by the RIP router will be redistributed.
   - **OSPF Routes** – Network routes learned by the OSPF router will be redistributed.
6. Click **Send Changes** and **Activate**.

Step 3. Configure BGP Preferences

In most cases, the default BGP preferences are sufficient and do not have to be configured. If you want, you can configure more detailed logging, special routing tables, and multipath handling.

1. On the **OSPF/RIP/BGP Settings** page, click **BGP Preferences** from the Configuration menu in the left navigation pane.
2. Specify the logging details according to your requirements.
3. Click **Send Changes** and **Activate**.

Step 4. Add an IP Prefix Filter

1. On the **OSPF/RIP/BGP Settings** page, click **Filter Setup IPv4** from the **Configuration** menu in the left navigation pane.
   > The Barracuda CloudGen Firewall also provides this configuration area for IPv6 addresses. When using IPv6, specify all settings described in the sections designated for IPv6. Note that IPv6 must also be enabled in FRR. For general information on the implementation of IPv6 on the Barracuda CloudGen Firewall, see IPv6.
2. In the **IPv4 Prefix Filter** table, add an entry for the IP prefix filter. Enter a descriptive name, for example ARIN , and then click **OK**.
3. In the **IPv4 Prefix Filter** configuration, enter an optional description. For example, ARIN Range.

4. In the **Sequence Number** section, click **+** to add a sequence number configuration and specify a unique identifier number for the prefix list item in the **Sequence Number** field. For example, `01`.
5. In the **Network Prefix** field, enter the network IP range that you received from the ARIN (in this example: *198.200.200.0/24*). Then click **OK**.
6. Click **OK**.
7. Click **Send Changes** and **Activate**.

Step 5. Configure Neighbor Settings

Before you configure the neighbor settings, the network for each provider that participates in BGP routing must be configured properly. Obtain and carefully verify the default gateway IP address for each provider.

> You must start configuring the neighbor settings on the provider side only after you have completed the previous sections for enabling BGP, configuring the BGP router, and adding an IP prefix filter. Otherwise, the BGP routing infrastructure will dampen any ICMP request and response, and the BGP service will have to be restarted on the ISP side. This ping dampening will occur whenever the BGP service goes up and down numerous times over a small period of time.

1. On the **OSPF/RIP/BGP Settings** page, click **Neighbor Setup IPv4** from the **Configuration** menu in the left navigation pane.
2. In the **Neighbors** table, add an entry for each provider network:
    1. Enter a descriptive name for the network and then click **OK**. The **Neighbors** window opens.
    2. In the **Neighbor IP** field, enter the default gateway IP address of the existing provider.
    3. From the **Enable BGP Routing Protocol Usage** list, select **yes**.
    4. In the **BGP Parameters** section, enter the BGP AS number of the ISP. (Do not enter the customer AS number that was specified in the BGP router settings.)
    5. In the **Neighbor Password** field, enter the password that should be used to connect to the neighbor peer.

        > The password can consist of small and capital characters, numbers, and non-alpha-numeric symbols, except the hash sign (#).

    6. Select **yes** from the **Update Source** drop-down list to enable the **Update Source Interface** setting.
    7. In the **Update Source Interface** field, enter an IP address from your network that should be used for the BGP session to this neighbor.

        > If you only advertise the ARIN route to go to providers (and not the network IP ranges or the ranges of other ISPs), it is highly recommended that you configure the **Peer Filtering for Output** settings. Select the peer filter from the IP filter list

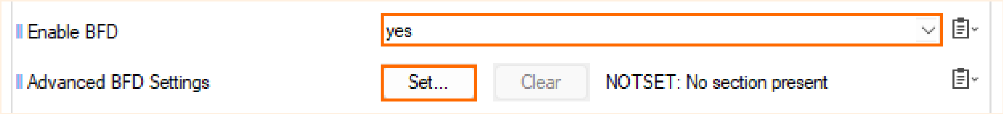
    that you created in the previous section (**Add an IP Prefix Filter**).
  8. Click **OK**.
3. Click **Send Changes** and **Activate**.

If BGP Neighbor Authentication is used but is misconfigured, the sessions and packets from the remote side may not show up in the firewall log/live/history view because they will be dropped by the kernel before reaching the firewall engine. This happens because this function uses TCP Authentication Option. For more information see https://datatracker.ietf.org/doc/html/rfc5925.

Step 5a. (optional) Configure Bidirectional Forward Detection (BFD)

BFD (Bidirectional Forward Detection) is a simple hello/echo protocol for detecting link failures between 2 connected neighbors.

You must switch to **Advanced Mode** in Firewall Admin to access the configuration for BFD!

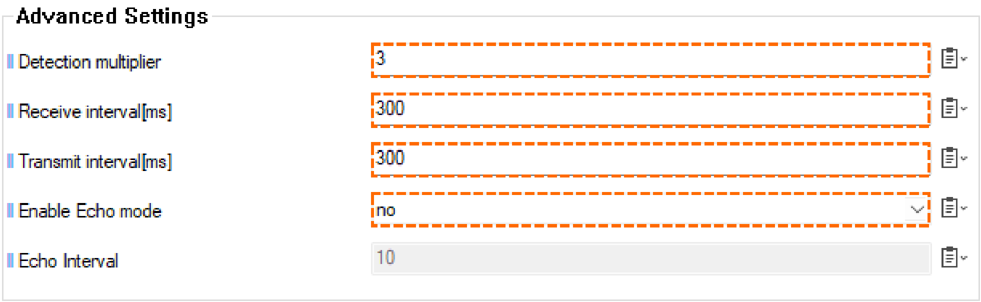


Enable BFD: yes
Advanced BFD Settings: NOTSET: No section present

BFD can only be configured for an existing IPv4 neighbor.

Perform the following steps to configure BFD:

1. On the **OSPF/RIP/BGP Settings** page, click **Neighbor Setup IPv4** from the **Configuration** menu in the left navigation pane.
2. Double-click an entry for a neighbor in the list of configured IPv4 neighbors.
3. The **Neighbors** window is displayed.
4. Scroll down to **Enable BFD** in the **BGP Parameters** section.
5. Select **yes** for **Enable BFD**.
6. Click the **Set...** button for **Advanced BFD Settings**.
7. The **Advanced BFD Settings** window is displayed.
8. The edit fields are already preset with commonly used values:



Advanced Settings
Detection multiplier: 3
Receive interval[ms]: 300
Transmit interval[ms]: 300
Enable Echo mode: no
Echo Interval: 10

9. If necessary, change these values to match your requirements.
10. Click **OK**.
11. Click **Send Changes** and **Activate**.

Step 6. Add the IP Address of the BGP Router

You must add the IP address of the BGP router as a shared IP address in the **IP Configuration** on the Barracuda CloudGen Firewall. To add the IP address of the BGP router:

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 **+** to add the IP address of the BGP router. The **Shared Networks and IPs** window opens.
    1. In the **Network Address** field, enter the network the BGP router resides in.
    2. In the **Shared IPs in this Network** table, click **+** and add the IP address of the BGP router.
    3. From the **Responds to Ping** list, select **yes**.
    4. Click **OK**.
5. Click **Send Changes** and **Activate**.

Step 7. Create a Firewall Rule for BGP Router Communication

To allow communication with other BGP routers, introduce a host firewall rule that allows network traffic through TCP port 179. For more information on creating firewall rules, see Access Rules.

Administrating BGP Routers from the Command Line

The BGP routing daemon for the Barracuda CloudGen Firewall is based on the FRRouting Protocol Suite. You can configure and administrate the BGP router from the Barracuda CloudGen Firewall command-line interface.

1. Open the Command-Line Interface.
2. Enter `vtysh` to launch the configuration tool.

Figures