

# How to Configure Inbound Load Balancing and Link Failover with BGP

#### https://campus.barracuda.com/doc/17297/

BGP is used to announce routes to the neighboring networks. If you are using two or more ISPs to connect to the Internet, you can use BGP to assign a preferred link to each propagated subnet. To make your preferred route more attractive to the remote router, you can make the secondary link appear longer by artificially lengthening its AS-Path. Because BGP neighbors are continuously monitored by the remote router, inbound link failover is achieved because the secondary link is automatically chosen if the preferred link becomes unavailable.



#### **Before You Begin**

Before you configure the BGP service, get an AS number for your network. AS numbers from 64512 to 65534 and 4,200,000,000 to 4,294,967,295 are reserved for private networks.

#### Step 1. Enable the BGP Service



Create and configure the BGP service.

- 1. Create an **OSPF/RIP/BGP Service**.
- 2. Go to CONFIGURATION > Configuration Tree > Box > Assigned Services > OSPF-RIP-BGP-Service > OSPF/RIP/BGP Settings.
- 3. Click Lock.
- 4. From the Run BGP Router list, select yes.
- 5. From the **Operation Mode** list, select **advertise-learn**.
- 6. In the **Router ID field**, enter the IP address of the router.
- 7. Click Send Changes and Activate.

#### Step 2. Configure the BGP Service

Configure the BGP service and propagate the local subnets (e.g., 10.0.0.0/24 and 172.16.16.0/24).

- 1. Go to CONFIGURATION > Configuration Tree > Box > Assigned Services > OSPF-RIP-BGP-Service > OSPF/RIP/BGP Settings.
- 2. In the left pane, click **BGP Router Setup**.
- 3. Enter the **AS Number** for your network.
- 4. In the **Terminal Password** fields, specify a password for connecting to the BGP router service via telnet from the shell of the Barracuda CloudGen Firewall.

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

- 5. In the **Networks** table, add the local subnets (e.g., 10.0.0.0/24 and 172.16.16.0/24). For each subnet:
  - 1. Click the plus sign (+).
  - 2. Enter a **Name** for the network and click **OK**.
  - 3. In the **Network Prefix** field, enter the subnet. This is the subnet that is propagated via BGP (e.g., 10.0.0.0/24 or 172.16.16.0/24).

Network Configuration		
Network Prefix	10.0.0/24	

- 4. Click **OK**.
- 6. Click Send Changes and Activate.



AS Number	64514					Ô
Terminal Password	Current					Ô
	New	•••				
	Confirm	•••				
	Strength					
Networks			/ +	×	at/ 📄	Ð <sup>(1)</sup>
	Name	Network Prefix				
	NETW01	172.16.16.0/24				
	NETW02	10.0.0/24				

## Step 3. Create BGP Neighbors

Specify the IP addresses of the BGP neighbors that the BGP routing information should be propagated to. Normally, the ISP's router is the BGP neighbor.

- 1. Go to CONFIGURATION > Configuration Tree > Box > Assigned Services > OSPF-RIP-BGP-Service > OSPF/RIP/BGP Settings.
- 2. In the left pane, click **Neighbor Setup IPv4**.
- 3. Click Lock.
- 4. In the **Neighbors** table, create a BGP neighbor for each ISP. For each BGP neighbor:
  - 1. Click the plus sign (+).
  - 2. Enter a **Name** for the ISP (e.g., ISP1bgpNeighbor).
  - 3. In the **Neighbors** window, specify the following settings:
    - Neighbor IPv4 Enter the IP address of the BGP neighbor (e.g., 192.168.0.1 or 192.168.1.1).
    - OSPF Routing Protocol Usage Select no.
    - RIP Routing Protocol Usage Select no.
    - BGP Routing Protocol Usage Select yes.
    - **AS Number** Enter the AS number that is assigned to the BGP neighbors (e.g., 64513 or 64515).
    - Update Source Select Address.
    - Update Source IPv4 Address Enter the IP address that is assigned to the interface of the BGP neighbor (e.g., 192.168.0.254 or 192.168.1.254).

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Neighbor IPv4	192.168.0.1	
Active	yes	
OSPF Routing Protocol Usage	no	
RIP Routing Protocol Usage	no	
BGP Routing Protocol Usage	yes	
OSPF Parameters		
Neighbor Priority		
Dead Neighbor Poll Interval		
BGP Parameters AS Number	64513	
BGP Parameters AS Number Description	64513	
BGP Parameters AS Number Description Peer Group Affiliation	64513	
BGP Parameters AS Number Description Peer Group Affiliation Update Source	64513 Address	
BGP Parameters AS Number Description Peer Group Affiliation Update Source Update Source Interface	64513 Address	
BGP Parameters AS Number Description Peer Group Affiliation Update Source Update Source Interface Update Source IPv4 Address	64513 Address 192.168.0.254	
BGP Parameters AS Number Description Peer Group Affiliation Update Source Update Source Interface Update Source IPv4 Address Peer Filtering For Input	64513 Address 192.168.0.254 Set Clear NOTSET: No section present	

- 4. Click **OK**.
- 5. Click Send Changes and Activate.

#### Step 4. Create IPv4 Prefix List Filters

Create prefix list filters for each local subnet.

- 1. Go to CONFIGURATION > Configuration Tree > Box > Assigned Services > OSPF-RIP-BGP-Service > OSPF/RIP/BGP Settings.
- 2. In the left pane, click **Filter Setup IPv4**.
- 3. Click Lock.
- 4. In the **IPv4 Prefix List Filters** table, create a filter for the local subnets (e.g., 10.0.0/24 and 172.16.16.0/24). For each local subnet:
  - 1. Click the plus sign (+).
  - 2. Enter a Name.
  - 3. In the **Sequence Number** section, click the plus sign (+).



IPv4 Prefix List Configuration									
Description	10er								Ô
Sequence Number			P	÷	×	÷	4	Đ	Ô
	Sequence Num	Network Prefix	T	уре			Ex	tent 1	
	1	10.0.0/24	p	ermit			no	ne	
	<							>	

- 4. In the **Sequence Number** window, specify the following settings:
  - Sequence Number Enter the sequence number (e.g., 1). For additional networks to the prefix list, iterate the sequence number.
  - Network Prefix Enter the subnet (e.g., 10.0.0.0/24 or 172.16.16.0/24).
  - Type Select permit.
  - Extent Type Select none.

Sequence Number	1	Ô
Network Prefix	10.0.0/24	<b>(</b>
Туре	pemit v	Ô
Extent Type	none	Ô
Prefix Length	0-Bit	â

- 5. Click **OK** to close the **Sequence Number** window with your settings.
- 6. Click **OK** to close the **IPv4 Prefix Lists** window with your settings.
- 5. Click Send Changes and Activate.

#### Step 5. Create Route Map IPv4 Filters

For each BGP neighbor, create a route map to propagate your preferences on how you want the remote router to route traffic to your network. The route maps add the AS number a second time to the BGP entries, to influence the remote router's decision on which network route is more direct.

- 1. Go to CONFIGURATION > Configuration Tree > Box > Assigned Services > OSPF-RIP-BGP-Service > OSPF/RIP/BGP Settings.
- 2. In the left pane, click **Filter Setup IPv**4.
- 3. Click **Lock**.
- 4. In the **Route Maps IPv4 Filters** table, add a filter for each BGP neighbor that you created in <u>Step 3</u>. For each neighbor:
  - 1. Click the plus sign (+).
  - 2. Enter a Name and click OK.
  - 3. In the **Route Map Entry** section, click the plus sign (+).
  - 4. In the **Route Map Entry** window, specify the following settings:
    - Sequence Number Enter a unique sequence number (e.g., 1). This sequence



number must be unique across all route maps. For additional entries iterate the sequence numbers.

- Type Select permit.
- Match Condition Select IP\_Prefix\_List.
- **IP Prefix List** Select the IP prefix list that contains the subnet using this connection as the *preferred incoming route* (e.g., 10.0.0.0/24 via 64515 or 172.16.16.0/24 via 64513).
- Set Action Select None.
- 5. Click **OK**.
- 6. In the Route Map Entry section, click +.
- 7. In the **Route Map Entry** window, specify the following settings:
  - Sequence Number Enter a unique sequence number (e.g., 1). This sequence number must be unique across all route maps. Iterate the sequence number for further
  - Type Select permit.
  - Match Condition Select IP\_Prefix\_List.
  - IP Prefix List Select the IP prefix list that contains the subnet using this connection as a backup (e.g., 10.0.0.0/24 via 64513 or 172.16.16.0/24 via 64515).
  - Set Action Select AS\_Path.
  - Set addition to AS-Path Enter your AS number (e.g., 64514).

BGP Specific Conditions –

Route Map Entry					/ +	× 📄 췹
	S	Туре	Match Condition	IP P	Set Action	Set Weight
	1	permit	IP_Prefix_List	172er	AS_Path	100
	2	permit	IP_Prefix_List	10er	None	
	<					>

- 8. Click **OK** to close the **Route Map Entry** window with your settings.
- 9. Click **OK** to close the **Route Maps IPv4** window with your settings.
- 5. Click Send Changes and Activate.

#### **Monitoring BGP Routes**

To monitor the routes that are learned and propagated by BGP go to the **CONTROL** > **Network** page and click the **BGP** tab.

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Network	Next Hop	Metric L	Local Pref Weight	Path	Origin
=> 10.0.0/24	0.0.0.0	0	32768	Local	IGP
	0.0.0.0	0	32768	Local	IGP
• Neighbor: 192.168.1.1	1				
i⊒∎ AS 64513					
	1				
<u> </u>					

Interfaces/IPs	IPs	Interfaces	Proxy ARPs	ARPs	Statistics	OSPF	RIP	BGP	Switch Info
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#### Figures

- 1. bgp\_two\_isps.png
- 2. BGPLocalSubnets.png
- 3. BGPService.png
- 4. BGPNeighbor.png
- 5. BFPPrefixList.png
- 6. BGPSequence.png
- 7. BGPRouteMap.png
- 8. BGPmonitoring.png

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