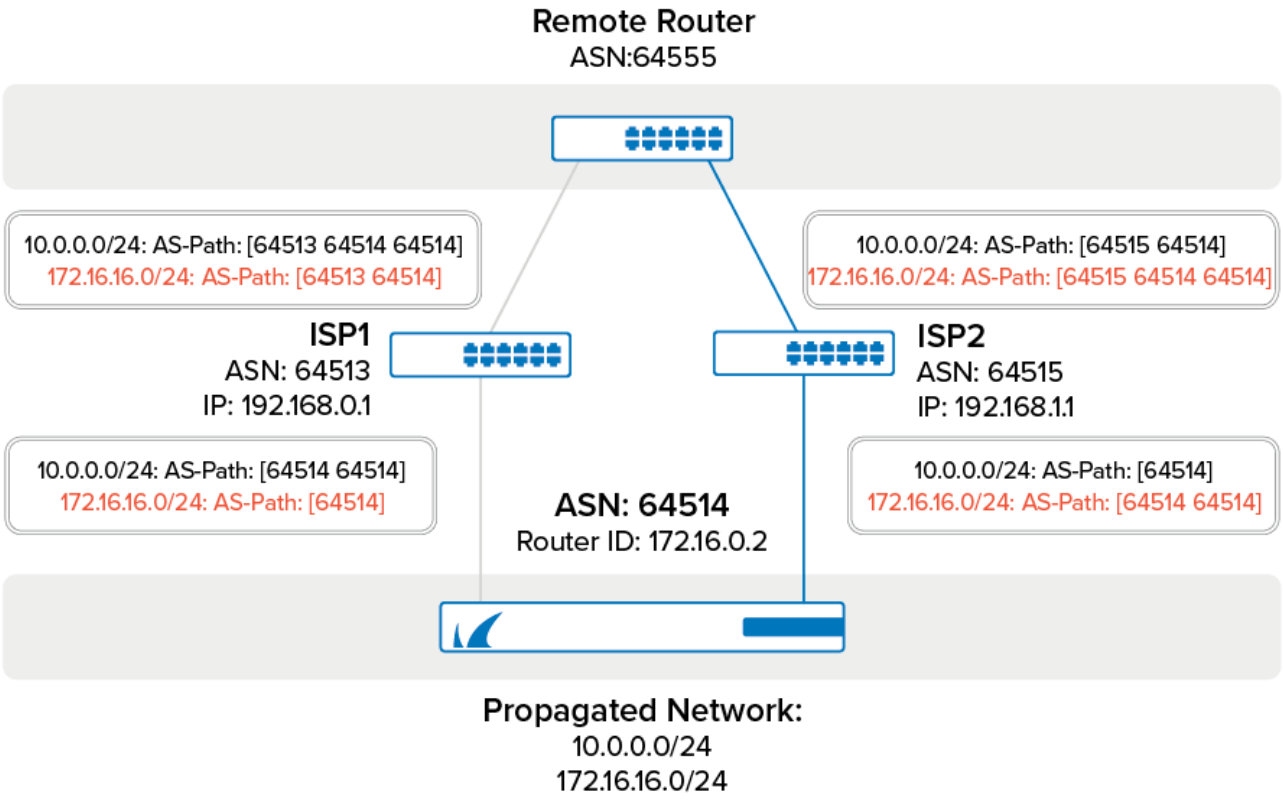
How to Configure Inbound Load Balancing and Link Failover with BGP

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

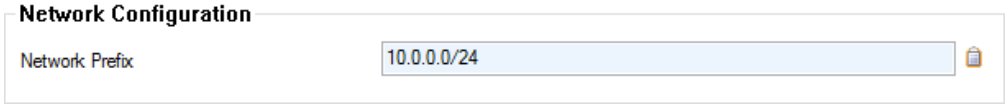
Create and configure the BGP service.

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**.

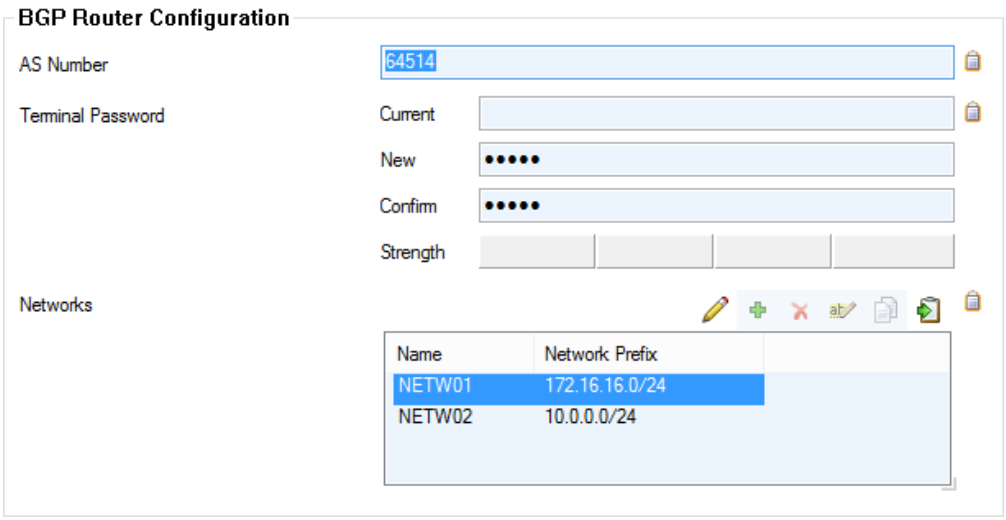
Step 2. Configure the BGP Service

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 Setting**s.
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-alpha-numeric 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`).

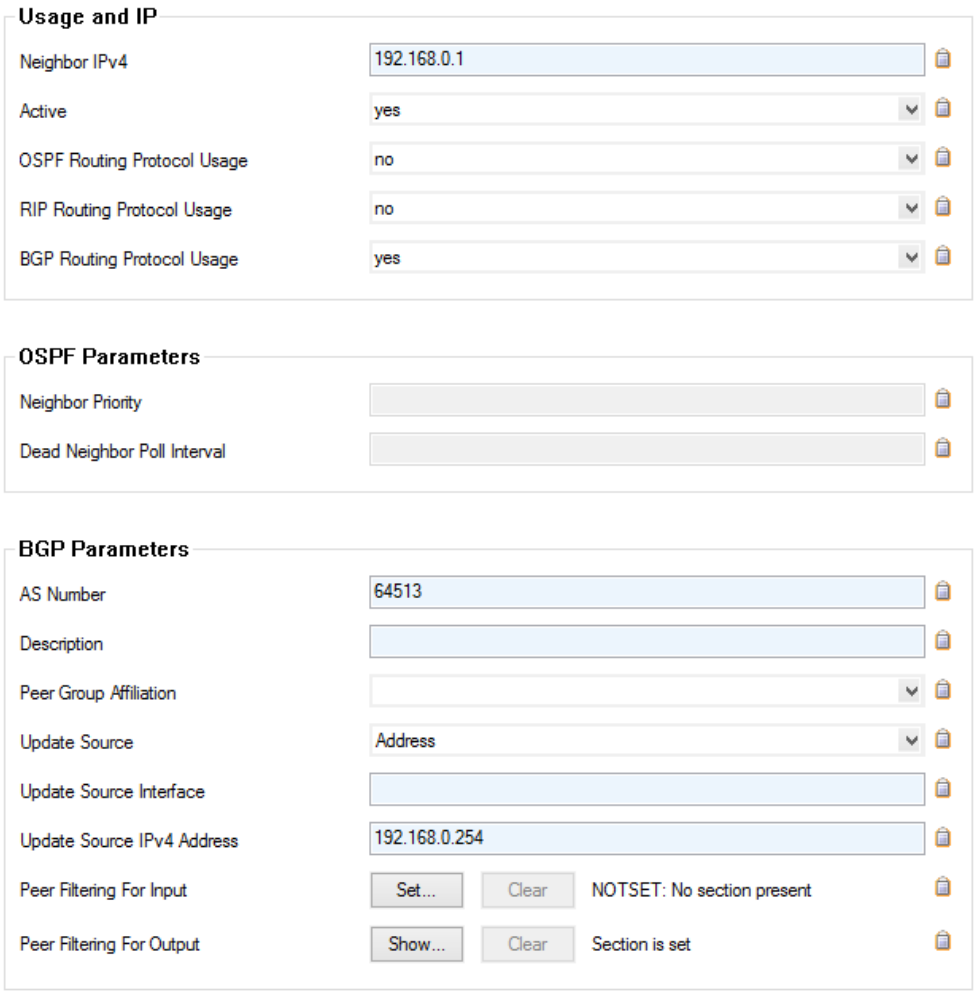
   4. Click **OK**.
6. Click **Send Changes** and **Activate**.



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 Setting**s.
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`).

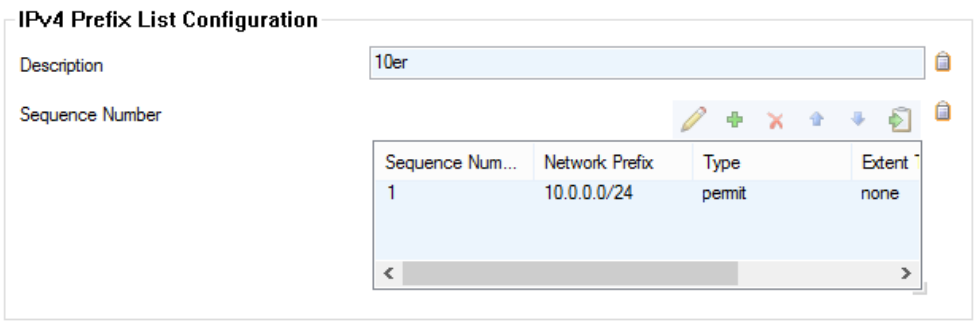


4. Click **OK**.
5. Click **Send Changes** and **Activate**.

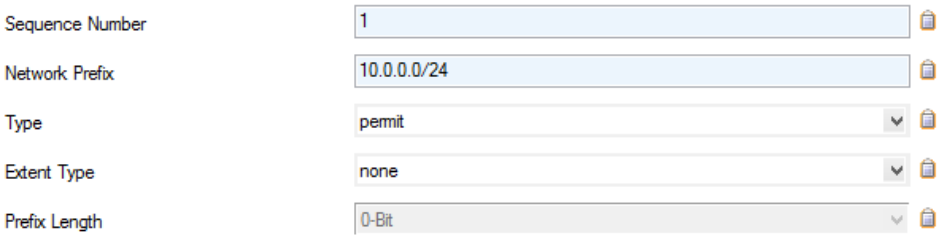
Step 4. Create IPv4 Prefix List Filters

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., 10.0.0.0/24 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 (**+**).



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**.



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**.

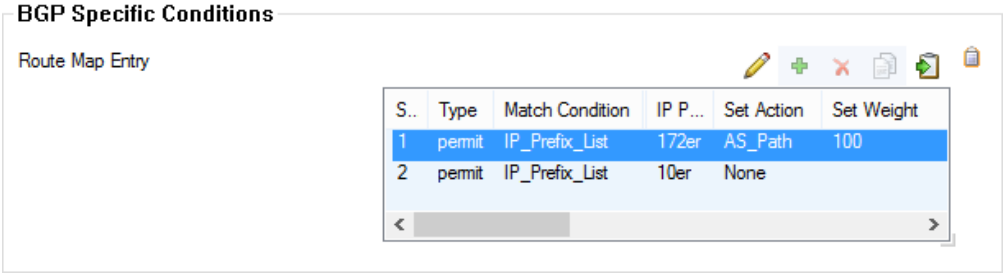
Step 5. Create Route Map IPv4 Filters

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 Step 3. 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).

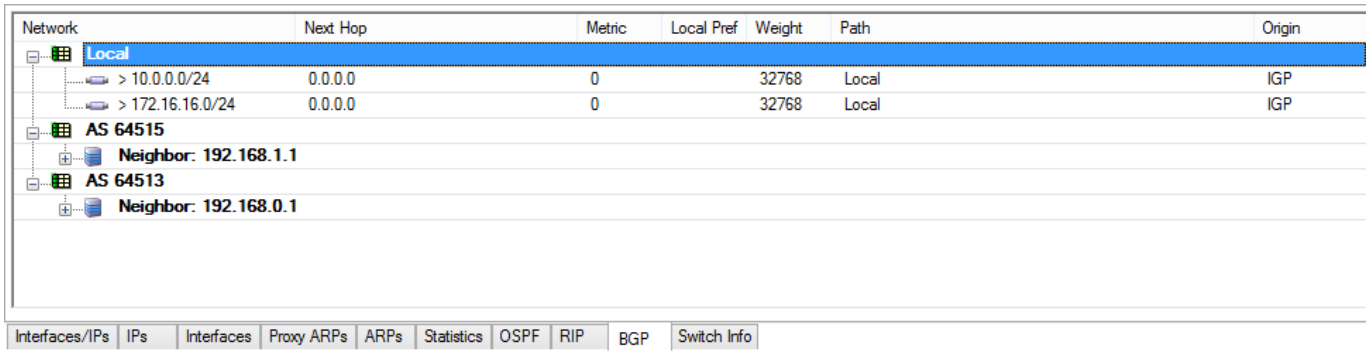


8. Click **OK** to close the **Route Map Entry** window with your settings.
9. Click **OK** to close the **Route Maps IPv4** window with your settings.

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.


Network
Next Hop
Metric
Local Pref
Weight
Path
Origin
Local
> 10.0.0.0/24
0.0.0.0
0
32768
Local
IGP
> 172.16.16.0/24
0.0.0.0
0
32768
Local
IGP
AS 64515
Neighbor: 192.168.1.1
AS 64513
Neighbor: 192.168.0.1
Interfaces/IPs
IPs
Interfaces
Proxy ARPs
ARPs
Statistics
OSPF
RIP
BGP
Switch Info

Figures

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5. BFPPrefixList.png
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7. BGPRouteMap.png
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