

How to Create a QoS Profile

<https://campus.barracuda.com/doc/96026280/>

When deploying traffic shaping, consider the CPU resources of the system. Especially on low-end machines, shaping on highly used links may cause performance degradation, resulting in high CPU loads and reduced network connectivity. Depending on the system configuration, Barracuda Networks recommends a maximum interface shaping bandwidth of 10 MB/s on systems with a CPU clock of 800MHz or lower.

QoS profiles are constructed of a root virtual interface, which may be attached to a real network interface and an arbitrary number of subnodes forming a tree. The output of any number of virtual interfaces can be fed into the input of a superordinate virtual interface.

A new virtual interface can be created on the subordinate level of an existing virtual interface. Each and every virtual interface of a QoS profile can be configured individually. QoS profiles are built as templates and will only perform traffic shaping when they are referred to by a physical network interface.

This way, the same QoS profile can be reused for several physical network interfaces. As a result, the limiting bandwidth rates are configured in relative numbers (percent), which become absolute values when assigning a physical network interface with absolute bandwidth values. When assigning QoS profiles to physical network interfaces, it is possible to decide if inbound and/or outbound traffic should be performed by the traffic shaping mechanism. With the assignment, the effective rates (in- and outbound) of the physical network interfaces are specified. Note that these rates do not need to be identical with the rate the interface is capable of, but they should rather specify the expected effective bandwidth (for example, a 2 Mbit provider line accessed over a 100Mbit Ethernet interface).

Step 1. Create a QoS Profile

1. Go to **CONFIGURATION > Configuration Tree > Box > Traffic Shaping**.
2. Click **Lock**.
3. Click the **QoS Profile** tab.
4. In the **Virtual Interface** list, right-click and select **Add new QoS Profile**.
5. In the **Profile Name** field, enter a name for the QoS profile.
6. In the **Outbound** section, select an **Operation Mode** for traffic that is sent over the device:
 - **Shape** – The virtual interface limits traffic according to the **Outbound** settings.
 - **Passthrough** – Packets are immediately passed to the next tree node or to the associated network interface.
 - **Drop** – Packets are immediately discarded.
 - **Priority** – Packets are passed through the shaping tree without being queued.
7. In the **Priority Weights** fields, you can specify the relative weight of the three

priorities: **class1**, **class2**, and **class3**.

These weights specify the ratio of the traffic being propagated, assuming that the input traffic is evenly distributed.

8. In the **Inbound** section, select an **Operation Mode** and specify the **Priority Weights** for the inbound traffic (traffic that is received by the device). If you want inbound traffic to be handled with the same settings as outbound traffic, select **As-Outbound**.
9. Click **OK**.
10. Click **Send Changes** and **Activate**.

Step 2. Create a Virtual Interface

1. Go to **CONFIGURATION > Configuration Tree > Box > Traffic Shaping**.
2. Click **Lock**.
3. Click the **QoS Profile** tab.
4. In the **Virtual Interface** list, right-click the new **QoS Profile** and select **Add new virtual interface**.
5. In the **Virtual Interface Name** field, enter a descriptive name.
6. In the **Outbound** section, select an **Operation Mode** for traffic that is sent over the device:
 - **Shape** – The virtual interface limits traffic according to the **Outbound** settings.
 - **Passthrough** – Packets are immediately passed to the next tree node or to the associated network interface.
 - **Drop** – Packets are immediately discarded.
 - **Priority** – Packets are passed through the shaping tree without being queued.
7. In the **Assumed Rate** field, enter the bandwidth limit (%) for the virtual interface. This value represents a hard bandwidth limit for this virtual interface. Do not produce values lower than 512 kbit.
8. From the **Priority Adjustment** list, specify the adjustment of priority weights when packets are passed to the next virtual interface.
9. The **Queue Size (Bytes)** field is the hardcoded size of the virtual interface's internal queue (in bytes).
10. In the **Inbound** section, select an **Operation Mode**, enter an **Assumed Rate**, adjust the **Assumed Rate**, and specify the **Queue Size (Bytes)**.
11. Click **OK**.
12. Click **Send Changes** and **Activate**.

Step 3. Create a QoS Band

In order to assign traffic prioritization to the physical interface, you must apply the virtual interface to an existing QoS band.

1. Go to **CONFIGURATION > Configuration Tree > Box > Traffic Shaping**.

2. Click **Lock**.
3. Click the **QoS Band** tab.
4. Right-click the QoS band table and select **Add new QoS Band**.
5. In the **Name** field, enter a descriptive name. (The ID field specifies the index number of the new QoS band.)
6. Click **OK**.
7. In the **QoS Band Rule** window, you can edit the following settings to specify the priority, interface, and conditions for traffic that is handled by the QoS band:
 - **Priority** – From this list, select the priority class that is assigned to data packets that are handled by the QoS band.
 - **Virtual Device** – From this list, select the virtual interface into which the data packets will be fed, should this rule apply.
 - **TOS** – To specify a value that must be matched by the TOS in the IP header, select this check box.
 - **Traffic Limit** – To specify a data limit that must not be exceeded by network sessions, select this check box.
 - **Time Period** – To specify specific dates and times during which this rule can be applied, select this check box.
 - Weekday/Hour – To specify specific weekdays and times during which this rule can be applied, select this check box.
8. Click **OK**.
9. Click **Send Changes** and **Activate**.

Step 4. Assign the QoS Profile to the Physical Interface

To apply traffic shaping settings to a physical interface, such as port1, complete the following steps:

1. From the **Interface** table, double-click the interface to which the QoS profile should be assigned to.
2. From the **Assigned Profile** list, select the new QoS profile.
3. In the **Rate** section of the **Interface Tree Mapping** window, select *Enable Shaping* and enter a limit for the inbound and outbound bandwidth.
4. Click **OK**.
5. Click **Send Changes** and **Activate**.

Step 5. Apply Traffic Shaping to Application or Access Rules

1. Go to **CONFIGURATION > Configuration Tree > Box > Assigned Services > Firewall > Forwarding Rules**.
2. Click **Lock**.
3. Create or double-click the access or application rule to which you are applying the QoS band.

For example, *LAN-2-INTERNET-https*.

- To apply the QoS band to an access rule:
 - Select the QoS band from the **QoS Band (Fwd)** and **QoS Band (Reply)** list in the **Policy** section. For more information, see [How to Create and Apply QoS Bands](#).
- To apply the QoS band to an application rule:
 - Select the **Change QoS Band (Fwd)** check box in the **Policy** section and select the QoS band from the list.

The outbound and inbound rate of a virtual interface is ignored when the **QoS Band** policy in the corresponding access rule is set to **No-Shaping**.

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

You can also apply traffic shaping settings to multiple rules. In the rule editor window for the rules, specify the following settings:

- In the **Rule Settings** section, configure the **Forward Band** and **Reverse Band** settings.
- In the **TCP Policy** section, configure the **Syn Flood Protection** setting.

For more information, see [How to Edit, Copy, Clone, Deactivate, or Delete Access Rules](#).

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