

Traffic Shaping

<https://campus.barracuda.com/doc/73699568/>

Limited network resources make bandwidth prioritization necessary. To ensure that important, business-critical applications are given enough bandwidth, the firewall provides traffic shaping (also known as "packet shaping" and "QoS" (Quality of Service)) methods to let you prioritize network resources according to factors such as the time of day, application type, and user identity. You can identify the traffic and assign its priority using access rules.

Traffic Classification

Classification by the access ruleset is *static* - it does not change after the session is initiated. For classification according to *dynamic* factors such as the time of day or download volume, the firewall provides the QoS band.

Network data can be shaped in the following ways:

- **Outbound shaping** - The traffic is shaped before it is delivered to a network interface.
- **Inbound shaping** - The traffic is shaped after it is received by a network interface.

Bandwidth Policies

There are eight different bandwidth policies. They are listed in the following table, in order of decreasing priority:

Bandwidth Policy	Description
VoIP	Highest priority before all other bandwidth policies. Traffic is sent with no delay.
Interactive	Highest priority.
Business	Very high priority.
Internet	Medium priority. If more than 10 MB of data is transferred in one session, the priority of the traffic in that session drops to the same as Background.
Background	Next lower priority.
Low	Low priority. Low and Lowest Priority are limited to 5% of the available bandwidth.
Lowest Priority	Lowest priority. Low and Lowest Priority are limited to 5% of the available bandwidth.

Choke	Applications assigned this are unusable, but will not seek another way to send traffic. For example, if you wish to block Skype traffic, assign this policy to the Skype application.
--------------	---

- **VoIP** will always be given first priority. The same applies for **Interactive**, which is limited to 90% of the overall available bandwidth, thus always leaving at least 10% for VoIP traffic.
- The bandwidth ratio of **Business : Internet : Background** is **10:2:1** for residual bandwidth that is *not* used by **VoIP** or **Interactive**. In addition, **Internet** has a built-in size limit of 10 MB, after which a session is downgraded to **Background**, thus receiving a smaller bandwidth ratio after the limit is exceeded.
- The **LowPrio** virtual interface is limited to 5% of the overall available bandwidth. The bandwidth ratio of the **LowPrio : LowestPrio : Choke** shaping connectors is **10:2:1**.
- The **Choke** virtual interface is limited to 0.1% of the overall bandwidth. These shaping connectors are ideally used to slow down somewhat unnecessary traffic and applications that cannot be completely blocked.

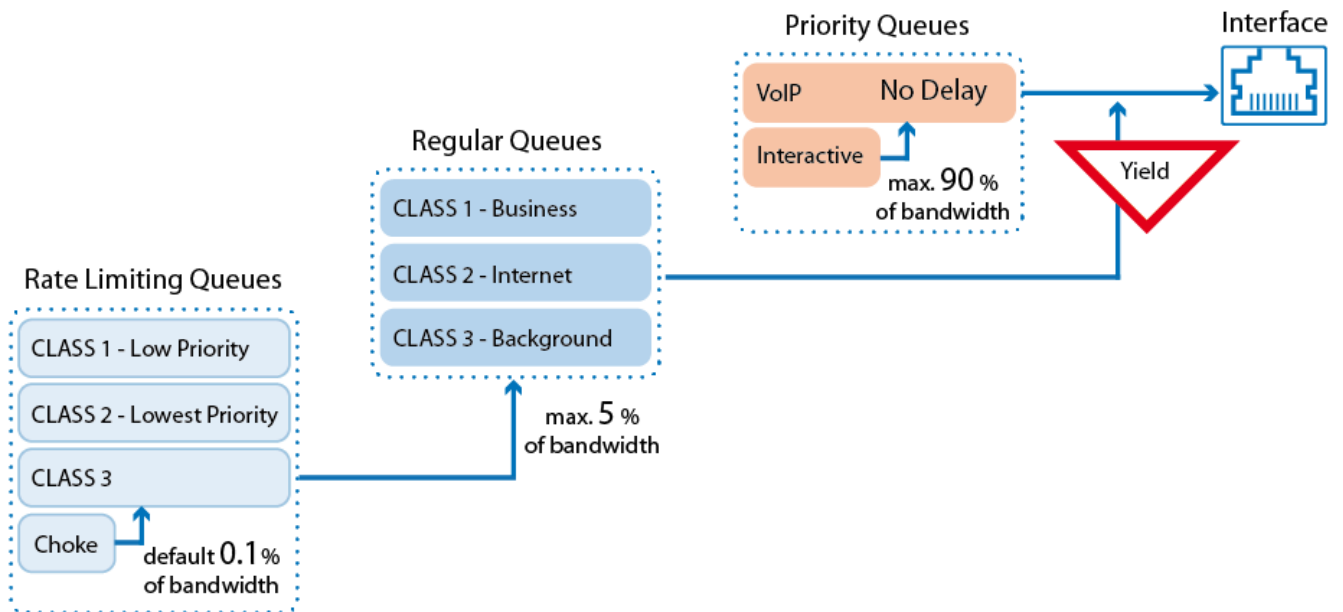
Queues and Rate Limits

The following diagram shows how the eight bandwidth policies are divided into queues:

- The Priority Queues always take precedence.
- The Regular Queues can use unlimited bandwidth.
- The Rate Limiting Queues are collectively limited to 5% of the maximum link bandwidth.

The rate limits always apply, so even if there is no other traffic, the traffic in the Rate Limiting Queues never uses more than 5% of the bandwidth.

The classes within the Regular and Rate Limiting queues are weighted relative to the other classes in the same queue. Class weights are enforced only when the link is saturated.



In order to use traffic shaping, you must refer to it in an access rule. For instructions on how to configure traffic shaping, see [How to Create and Apply QoS Bands](#).

Figures

1. qos_scheme.png

© Barracuda Networks Inc., 2024 The information contained within this document is confidential and proprietary to Barracuda Networks Inc. No portion of this document may be copied, distributed, publicized or used for other than internal documentary purposes without the written consent of an official representative of Barracuda Networks Inc. All specifications are subject to change without notice. Barracuda Networks Inc. assumes no responsibility for any inaccuracies in this document. Barracuda Networks Inc. reserves the right to change, modify, transfer, or otherwise revise this publication without notice.