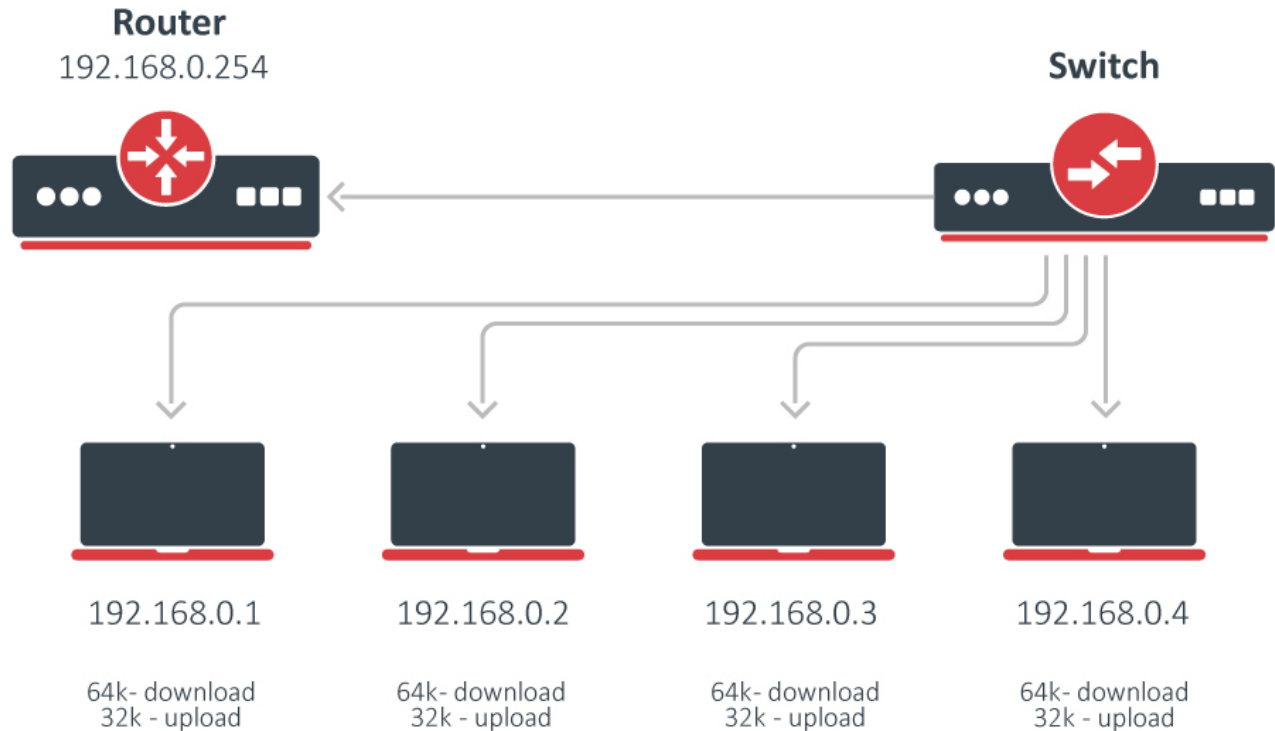# PCQ example

Per Connection Queue (PCQ) is a queuing discipline that can be used to dynamically equalize or shape traffic for multiple users, using little administration. It is possible to divide PCQ scenarios into three major groups: equal bandwidth for a number of users, certain bandwidth equal distribution between users, and unknown bandwidth equal distribution between users.

Equal Bandwidth for a Number of Users

Use PCQ type can be used through the Queue Tree and Simple Queues to equalize the bandwidth [and set max limit] for a number of users. We will set the 64kbps download and 32kbps upload limits.

Step 1: add PCQ in Queue Types

Add two new entries - one for download and one for upload. `dst-address` is a classifier for the user's download traffic, and `src-address` for upload traffic:

```
/queue type add name="PCQ_download" kind=pcq pcq-rate=64000 pcq-classifier=dst-address
/queue type add name="PCQ_upload" kind=pcq pcq-rate=32000 pcq-classifier=src-address
```

Step 2: deploy the PCQ

Queue Tree option

Mark all packets with packet-marks upload/download: (let's consider that ether1-WAN is the public interface to the Internet and ether2-LAN is a local interface where clients are connected):

```
/ip firewall mangle add chain=prerouting action=mark-packet \
    in-interface=ether2-LAN new-packet-mark=client_upload
/ip firewall mangle add chain=prerouting action=mark-packet \
    in-interface=ether1-WAN new-packet-mark=client_download
```

Then, two queue rules are required, one for download and one for upload:

```
/queue tree add parent=global queue=PCQ_download packet-mark=client_download
/queue tree add parent=global queue=PCQ_upload packet-mark=client_upload
```

Simple Queues option

Alternatively you can do it with one command like so:

```
/queue simple add target=192.168.0.0/24 queue=PCQ_upload/PCQ_download
```