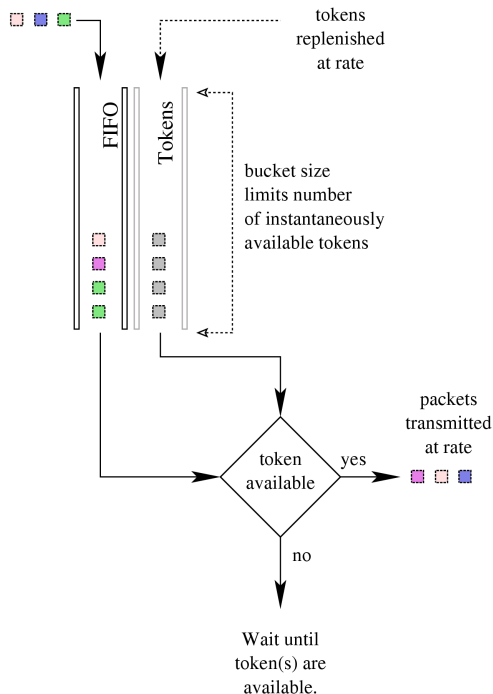
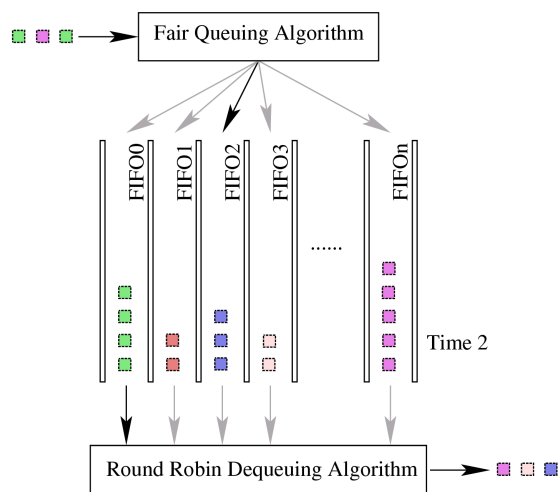


Traffic Control Concepts for Linux

Token Bucket Filter (TBF)



Stochastic Fair Queuing (SFQ)



The six operations

- Shaping, delaying packets, slowing a queue
- Scheduling, (re)arranging queued packets
- Classifying, separating packets/flows
- Policing, matching a packet/flow to a rate
- Dropping, discarding a packet/flow
- Marking, modifying the packet itself

The basic mechanisms

- Queues, buffers which contain packets
- Tokens, which arrive at a specified rate
- Buckets, a container to collect tokens

The Linux objects

- qdisc, the queuing discipline
- class, a flexible internal queue
- filter, for classifying and policing
- classifier, identifying flows/packets
- policer, limiting matching flows

Basic rules

- For shaping traffic on a link, always be the bottleneck.
- You can only shape transmitted traffic.
- Every interface must have a qdisc.
- Any newly created class contains a FIFO.
- A classful qdisc with no children classes only consumes CPU.
- Classes attached directly to the root qdisc can simulate virtual circuits.
- A filter can be attached to classes or a classful qdisc.

Classless qdiscs

- FIFO; first-in, first-out
- SFQ; stochastic fair queuing
- TBF; token bucket filter
- GRED; generic random early drop

Classful qdiscs

- CBQ; class based queuing
- HTB; hierarchical token bucket
- PRIO; prioritizing
- WRR; weighted round robin

Practical scripts

- cbq.init, CBQ through config files
<http://sourceforge.net/projects/cbqinit/>
- htb.init, HTB through config files
<http://sourceforge.net/projects/htbinit/>
- wondershaper, for ADSL/cable
<http://lartc.org/wondershaper/>
- tcng.init, for tcng config files
<http://linux-ip.net/code/tcng/tcng.init>

Resources

- LARTC HOWTO and mailing list
<http://lartc.org/>
- documentation by Stef Coene
<http://docum.org/>
- documentation by Martin A. Brown
<http://linux-ip.net/>