QoS

Some packets are more equal than others.

Why should we care?

- Realtime vs. Bulk
  - Telnet vs. SMTP
  - SSH vs. HTTP
  - VOIP vs. BitTorrent

Demonstrate ssh latency frustration over loaded link.
Play disrupted VOIP recording.
Demonstrate latency measurement with ping over unloaded and loaded links.

Okay, we want it. Let's legislate it!

Umm, no.

QoS scripts

- Wondershaper
  - The granddaddy. Still works great but room for improvement.
- qos-re
  - Great QoS script for OpenWRT
- qorset

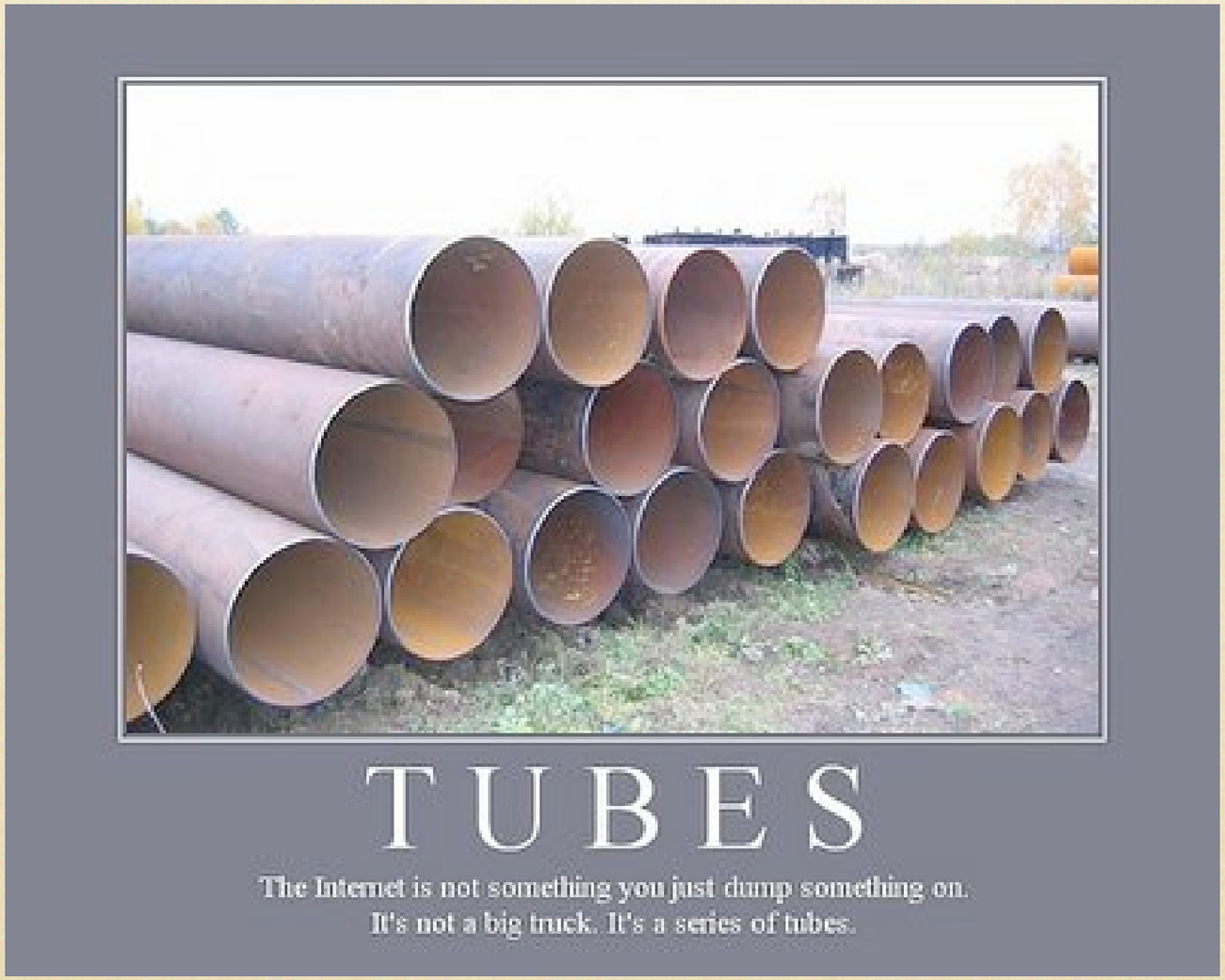
I wrote qorset as something simpler than qos-re that would still work well. More transparent, and good for pedagogy

Fine, show us how to do it ourselves.

- Tools of the Trade
  - Linux
  - iproute2
  - iptables
  - understanding of queues

Queues

The internet is a series of tubes.



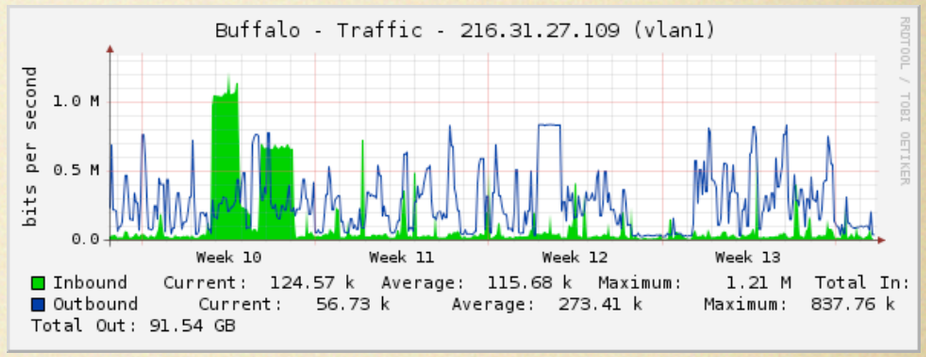
Cue funny audio clip with hidden wisdom. He was right, sort of. You certainly can think of every link as a tube, and if you want, every queue can be a tube too.

Oh no, you're not going to ramble on about theory are you?

- Queues: the good, the bad, and the ugly.
  - good: your packets get there
  - bad: introduces latency
  - ugly: throughput sells

Cue (groan) video clip from Hitchhiker's Guide to the Galaxy "I'm British. I know how to queue"

Be the Bottleneck



- If you have graphs, e.g. from cacti, look for mesas
- Instantaneous measurements from several online flash applets. (e.g. http://www.auditmypc.com/internet-speed-test.asp)
- Do it yourself with e.g. HTTP/SCP (both directions!)
- Watch ping latencies

Queueing Disciplines

- SFQ—Stochastic Fair Queueing
- TBF—Token Bucket Filter
- HTB—Hierarchical Token Bucket

Do a token bucket on the whiteboard.

HTB

- The tree
- Enqueue from the root
- Dequeue from the root
- Sharing

qdisc is short for Queueing Discipline, of course
draw example tree on the whiteboard and explain

Filters

- "How do I classify this packet?"
- tc provides many filters
  - tos
  - based on iptables MARK
- Any filter you can dream up you can do with iptables

the root is asked first, then its answer, etc.

Alright Already!
Let's see the code!

walk/run/skip through qorset code

QoS Classes

- Expedited
- Interactive
- Best Effort
- Bulk
- The Dregs of the Internet

hard realtime, soft realtime, normal, “just get it there eventually”, “if you have room”
These aren’t canonical, but I think they’re a good set.

Links

- http://hans.fugal.net/qos—this presentation
- http://lartc.org/—Linux Advanced Routing & Traffic Control HOWTO
- http://luxik.cdi.cz/~devik/qos/htb/
- http://l7-filter.sourceforge.net/