"Quality of Service", a common misconception

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Disclaimer

- This is general information
- Tainted by personal preference
- Each slide could be a full day talk and not cover all the edge cases
What is QoS?

- Deciding which packets to drop during congestion
- No congestion == No benefit
- No ability to differentiate packets == No benefit
How does it work?

• Assign traffic to >1 “traffic class”
• Via DSCP bits (or MPLS EXP etc.)
• Or using ACL filters for IP src/dest/ports
• Assign each traffic class:
  • Bandwidth (Mb/sec)
  • Queue size (ms, MB, %)
What does congestion mean?

• An attempt to send data above line rate
• This is congestion
• After “some time” the packet buffers fill up and block new packets
• This is called tail dropping, and is the more critical problem
• On systems using QoS buffers are sliced per-queue reducing this time
On buffer sizes

- Some devices have buffers so small that you shouldn’t enable QoS
  - Ex: Cisco 2960 series

- Some devices have buffers so large you need QoS to avoid “buffer bloat”
  - Most “carrier grade” routers (Ex: Juniper T series)

- Some devices are just horrible
  - The Cisco Catalyst 6500
General rules

- “Low latency” == small buffers, frequent drops
- “High throughput” == large buffers, few drops
- In practice you need to balance the two
Software routers

- Buffer sizes on software routers is largely a config option, look into your specific devices
- For Linux see the cerowrt project
Choosing traffic classes

- **NC** - Routing & switching protocol traffic
- **AF “High pri”**
- **AF “Low pri”**
- **BE “Best effort”** - Everything else
- **“Scavenger”** - Very low pri traffic, eg backups
Conclusion

QoS can be a benefit, but unless you employ good network engineers the dangers can outweigh any benefits.

Think, and test, carefully before deployment.
Questions?

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