Motivation
- A single application can degrade the overall performance of the network.
- Port-based QoS features are too simplistic to support more robust QoS settings.
- Mechanisms to perform QoS functions are not based on specific application, devices, or users.

Solution
- Performing per-flow, application-based QoS.
- Delegating application identification and QoS configuration to an OpenFlow SDN controller.
- The controller can be on the router itself or on a separate device and runs either inside the home or from a remote location.
- Configure QoS policies at higher levels of abstraction.

FlowQoS Architecture
- Users configure priorities for specific high-level applications.
- The output from the portal is a configuration file that the rate shaper uses for shaping traffic.

How it works
- When the first packet of a flow arrives at the switch, a copy of this packet is forwarded to the controller.
- The switch performs default forwarding until application identification has been performed.
- FlowQoS installs the forwarding rules to restrict bandwidth usage associated with the application.

SDN-Based Rate Controller
- Assigns each flow to the appropriate rate.
- Enables per-flow QoS by instantiating a two-switch virtual topology.
- Each virtual link between the two switches corresponds to a different application group.
- Each link has a traffic shaper that corresponds to the user-specified rate.

Results and Future work
- Improves the performance of both adaptive video streaming and VoIP in the face of competing traffic.
- Extending the system to support additional features and applications.

FlowQoS: QoS for the Rest of Us
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Web Portal (Frontend)
- Rate Shaper
- Flow Classifier
  - Non-HTTP
  - HTTP

OpenFlow Controller (Backend)

Home Gateway

Internet

Home Router

Web

Video

VoIP

http://flowqos.noise.gatech.edu/