

# End-to-End Quality-of-Service in Software Defined Networking

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Quality of Service (QoS) deals with providing end-to-end guarantees to the users. These guarantees may include parameters like bandwidth and latency guarantees, packet loss, jitter, congestion control, etc. There are many ways in which such assurances can be obtained. On the control plane, a network operating system may exploit various services like prioritized scheduling, resource reservation, queue management, routing, etc. A NOS can monitor and implement group policies and management in the network which all contribute the overall QoS. ONOS is a production ready controller which is fine-tuned for performance. Most SDN controllers usually provide support for some of these features but do not provide an implementation of end-to-end guarantees.

This project aims at exploiting the implementation of ONOS controller to implement QoS mechanism to provide user guarantees. We write an application on the application plane of the SDN architecture running an ONOS controller, OpenFlow protocol, Open vSwitch and a simulated network on Mininet. Exploit ONOS' primitives for resource allocation and queue management to provide QoS guarantees. The idea is to evaluate the extent to which these QoS services can be guaranteed on ONOS controller. The project identifies the gaps in the current state of affairs for QoS in SDN. The dissertation performs a number of experiments to implement different possible QoS mechanisms on ONOS and identifies the abilities and shortcoming of the SDN controller. These deficiencies need to be addressed to help SDN move beyond the boundary of merely a research interest, and to be accepted in the production level day-to-day internet.