

## Implementation and Demonstration of Software-Defined Traffic Grooming

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**Abstract :** Since the traditional network is closed and it has no architecture to create applications, it has been unable to evolve with changing demands under the rapid innovation in services. Additionally, due to the lack of the whole network profile, the quality of service cannot be well guaranteed in the traditional network. The Software Defined Network (SDN) utilizes global resources to support on-demand applications/services via open, standardized and programmable interfaces. In this paper, we implement the traffic grooming application under a real SDN environment, and the corresponding analysis is made. In our SDN: 1) we use OpenFlow protocol to control the entire network by using software applications running on the network operating system; 2) several virtual switches are combined into the data forwarding plane through Open vSwitch; 3) An OpenFlow controller, NOX, is involved as a logically centralized control plane that dynamically configures the data forwarding plane; 4) The traffic grooming based on SDN is demonstrated through dynamically modifying the idle time of flow entries. The experimental results demonstrate that the SDN-based traffic grooming effectively reduces the end-to-end delay, and the improvement ratio arrives to 99%.

**Keywords :** NOX, OpenFlow, Software Defined Network (SDN), traffic grooming

**Conference Title :** ICCEE 2016 : International Conference on Computer and Electrical Engineering

**Conference Location :** Singapore, Singapore

**Conference Dates :** September 08-09, 2016