

Title :

Delay Analysis in Software Defined Networks With Distributed Controller By Round Robin discipline using Network Calculus

Abstract :

Software defined networking (SDN) is a new generation of networks which improves programming and network management through the separation of control plane and data plane in a network. An issues of great importance in SDN is scalability and specially scalability of control plane. With the spread of networks, existance of a controller turns out to be an important performance challenge. Distribution of control plane is a technique which is suggested for improving network performance. In the present study an analytical model is presented for SDN based on Open Flow standard which computes the worst case delay bound of such SDNs for the distributed control plane through network calculus framework. The presented model describes the functionality of an SDN switch and the controllers and considers some performance criteria like delay and buffer length. The results are investigated with the change of various parameters like network size, traffic specifications and the number of controllers. The purpose of presenting an analytical model is investigating effective parameters in scalability of control plane quantitatively, so that network operators can investigate the related parameters of scalability accurately while designing process. The results can be employed for evaluation of SDN models in primary stages of designing phase. The results of simulation results show a 20% to 40% improvement in the the worst case delay bound in distributed network compared with concentrated network.

Keywords :

Software Defined Networking (SDN), OpenFlow, Network Calculus, Delay Bound.