

ABSTRACT

Today, there are many scientific studies and approaches by researchers on the networks, especially on complex network, such as the Internet of things and cloud computing, which require reliability in dealing with client or host that's randomly shown, as well as data and packet in the complex network. Therefore, it takes a system that regulates the problem, one of them is using the concept of Software Defined Networking. SDN solve its problem by organizing a network centrally. This concept also an early approach of neural network used for machine learning or artificial intelligence.

Bandwidth Management or traffic control is one of the problems that exist in complex networks. This research implements SDN using traditional router device which previously wasn't support OpenFlow protocol yet, so we change it to OpenFlow-enabled hardware using Open vSwitch and LEDE Project. Open vSwitch here applies as data plane on the network. So, controller can communicate with data plane. The Bandwidth Management Service here applies 3 services, namely Web (HTTP/HTTPS). VoIP, and Video Streaming. Controller task is to identify, to control and to monitor packet-in, and shown controller status.

From the result of research, bandwidth management using SDN Network. The efficiency of traffic control was influenced by the specified bandwidth value, when bandwidth value is 0.8 Mbps efficiency reaches 97.6% and CPU & RAM usage is only 1.83% & 34.0% while when bandwidth value is 80 Mbps efficiency decreases to 87.77% but CPU & RAM usage increases to 34.7% & 34.0%. For QoS results, from Video Streaming and Data services all four test parameters have met the standard of ITU-T G.1010 reference, while VoIP also meets the reference standard except the jitter of the service. However, since the MOS of the VoIP service rating test is 4.06 that's good. So, the VoIP service can be used too in the designed network.

Keyword: Software Defined Network, Bandwidth Management, Traffic Control, OpenFlow, Open vSwitch