Deployment of SDN on Cloud Computing for Distance Learning Application

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Abstract

Many people aspire to get a certificate after high school graduation. Some of them can’t do that for many reasons such as: economic situation, limited number of seats available in colleges, or availability of the specialization according to their preferences. Distance learning could be a choice for such people. In fact, distance learning is less expensive and more flexible compared to campus-based study.

As such, distance learning services need to be delivered in a fast and reliable way, especially the services that require real-time communication. Currently, the number of students who use distance learning is on the rise and this adds more stress and load on the network. Software Defined Networking (SDN) is a new network architecture that decouples the control layer from infrastructure layer. The main goal of SDN is to provide a rapid response to the ever-evolving requirements of today’s businesses. Unlike traditional network architectures, SDN is more flexible and agile to support the dynamic computing and the huge storage of resources hosted in the cloud and data centers. Additionally, SDN characteristics can enhance the overall performance of distance learning systems and provide reliable distance learning services. To the best of our knowledge, no prior work has investigated employing SDN in distance learning.

Therefore, this thesis focuses on deployment of SDN on cloud computing for distance learning application. The architecture of SDN deployment with Cloud computing is implemented using Mininet emulator, OpenDayLight controller, and LAMP open-source software. The results showed that the SDN has better performance compared to traditional network in terms of throughput and delay. Moreover, SDN is better than traditional by up to 1.1x. for the range of size that varies between 22 MB to 900 MB. The results also showed that the OpenDayLight controller has provided a flexible platform that could improve the services offered by distance learning systems.