

SYSC5801 Assignment 2

MPLS has been successful in two main areas: traffic engineering (TE) and virtual private networks (VPNs). We have covered TE to some degree (and will cover MPLS VPNs later). One of the challenges of the MPLS architecture is the complexity of the control plan, e.g., OSPF-TE, RVSP-TE, etc. Software-defined networking (SDN) is an emerging technology. SDN has received a great deal of attention lately. SDN has the potential to simplify the complexity of the control plan for the MPLS architecture. The objective of this assignment is to study the basics of SDN and compare the traditional MPLS-TE technology to MPLS-TE with the SDN technology.

There are many Web links to SDN that provides an introduction to SDN and a brief comparison of MPLS and SDN-based MPLS. Here is one example:

<http://www.sdncentral.com/guest-blog-posts/does-mpls-make-sense-in-cloud-data-centers/2012/12/>

The first part of the assignment is to study SDN and write a short summary about the technique, including:

- What is SDN?
- What are the main advantages?
- What are some limitations?

The second part is a comparison of the traditional MPLS-TE and the MPLS-TE using the concept and technique of SDN. The comparison should consider the materials that have been covered in class for MPLS control plan. Specifically, the comparison should at least include the phases that are involved in the traditional MPLS-TE control plan: *information distribution*, *path calculation*, and *path setup*. One of the first papers discussing this topic is:

Ali Reza Sharafat, Saurav Das, Guru Parulkar, and Nick McKeown, “MPLS-TE and MPLS VPNs with OpenFlow”, *Proc. of IEEE SIGCOMM*, 2011.