

**SOFTWARE DEFINED WIDE AREA NETWORKS**

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**1.ABSTRACT**

This project is about showing how efficient software defined wide area networks are by comparing it with traditional wide area networks in DevNET’s virtual environment sandbox.

(we will write summary of the main findings and summarize problem method and rslt)

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4. **INTRODUCTION**
   1. PROBLEM BACKGROUND AND HOW TO SOLVE IT

In today’s word, companies are getting larger and more complicated, so their needs in data trafficking. Configurating hundreds, thousands of devices is money and time consuming, and it is not just that. With the evolving technology, social media platforms, software as a service (SaaS) cloud technologies, people realized they need to be as independent as they could be from hardware.

In traditional networks, every router has a control plane which commands the data plane how to behave. This control plane is the software part of the device where we configurate it via CLI and such. In the other hand data plane is the hardware part where the data coming from other devices routing to one another by the current configuration. These two different entities are placed in the same place in a switch, acting as one entity.

By that and many, people started to thing about "Control plane being on every each device is a problem." and began to create the SDN.

The concept of the SDN is data plane and control plane are seperated.

The software part is pulled to a central point, so that it can see and manage the whole network, evulate it and decide on it.Now the control plane is in a central location and it can see the whole network, it has a acommand on the neighbor and routing tables of all switches on the network. Decision-making becomes smarter. On the other hand SDN is abstracting the infrastructure of the network from the applications. In this way, SDN makes it possible to data planes to be programmable.

With a centered, executive control plane, we are free from the dependency of the hardware and head to the software to change the whole network as once.

1. **MAIN**
   1. **A SIMPLE LOOK TO MPLS AND COMPARATION TO SD-WAN**

Multi Protocol Label Switching (MPLS) is a highly scalable and protocol-independent data transport system which is highly using from enterprises. It is a 2.5 layer protocol. In MPLS networks, tags are assigned to data packets, and the packet transfer process is done only depending on the contents of these tags, regardless of the contents of the packet. This allows the establishment of point-to-point communication circuits regardless of the mechanism and protocols used.

The most asked question is ¨Should I switch to SD-WAN from MPLS?¨. What are the pros and cons and which one has the brightest future?

The reasons MPLS is so populer around the world are the Reliability and high performance.

* MPLS circuits are a special service with performance backed by SLAs. This ensures that traffic routed over these circuits is reliably transmitted to its destination.
* MLPS circuits remove much of the complexity of routing traffic through the Internet. This enables them to provide higher performance than traffic reliant upon other routing schemes.

However, MPLS is not a perfect networking solution. It has downsides balancing the advantages.

* **COST**: MPLS bandwidth is designed to provide high performance, reliable network connectivity. Even so this comes at a much higher price per bandwidth than a broadband Internet connection.
* **CENTRALIZATION**: Most MPLS connections are designed to send all traffic through a central hub then route to its destination. This can cause network latency due to inefficient routing.
* **GEOGRAPHIC LIMITATIONS**: MPLS circuits are a service offered by an ISP. If an MPLS provider is not available in a certain region, then it cannot be used to send traffic there.
* **SECURITY**: MPLS network doesn’t offer built-in data protection, and if incorrectly implemented, it can open the network to vulnerabilities.

SD-WAN roughly cover this downsides but yet, it is still proggtressing