

STUDY OF SDN FRAMEWORK AND PERFORMANCE EVALUATION OF SOFTWARE DEFINED NETWORKING

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Abstract: Excessive amount of information has emerged into big data centres. This data centres constituent of virtual network and virtual machines, so implies to emergence of SDN controllers for managing and controlling the SDN network. This paper proposes the framework of SDN for analysis of SDN network. The controller controls and manages the whole network by dissociating the control plane and data plane of the network. By the benchmarking of the network the performance analysis is carried out.

Index Terms - SDN, Control Plane, Data Plane.

I. INTRODUCTION

In the recent years the internet had made the society [1] for greater advancement and more comfort, even though new inventions has been made, fact is that it still contributes the best of service to the people. The new approach for networking known as Software Defined Networking [2] is introduced in recent year which dissociates the control from physical infrastructure. The control plane acts the masters which collects the data from its peripheral devices and present it to the controller which controls the entire SDN environment. Based on the information given by the control plane, the controller modifies the network for any applications based on their characteristics.

The SDN is been given by the open networking foundation as shown in the fig 1. This framework consists of the important [2] layers they are application, control, infrastructure, layers which are bundled completely on one on another. Firstly the data plane which is present in the infrastructure layer contains switching devices like router, switches. Two main responsibilities of the switching devices are:

- 1). Gathering the network condition and accumulating them physically in provincial devices and forwarding o the controller. The data like traffic, network usage, topology and statistics are the information present in the network status.
- 2). the controller provides some rules based on this packet processing is done by the data plane. By help of two interfaces the control plane provides the bridge between the infrastructure and application layer.

To communicate with the infrastructure layer the control plane provides the distinct objectives by the south-bound API, which includes the [3] functions like transporting the forwarding rules and updating the network status. In order to communicate with the application layer the control plane uses the north-bound API which provides different forms of service connection record.

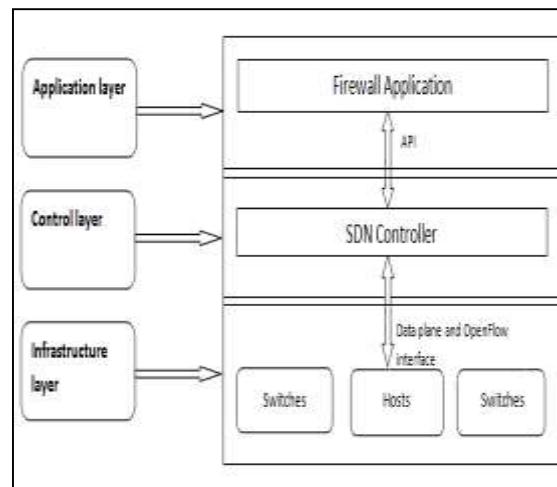


Figure 1: SDN Framework

This data plane provides the status guidance over the API, which in turn accessed by the applications of SDN to accommodate the system result and finalize this decision by setting up the forwarding protocol to data plane using API. Because of numerous controllers present for huge network authority domain, the controller requires the east-west connection interface to correlate their executive processing and instructions are contributed among the network.

The user necessity is satisfied by the application created in application layer of SDN. The application in SDN is capable of connecting and managing switching devices over programmable platform implemented through control layer founded in infrastructure. Some SDN applications are network virtualization, logical flexibility, load balancing in server, effective access control and migration.

The traffic measure and the data regarding it have to be [3] collected before analyzing the traffic and flow components. By using the design of system passive observation is carried out for capturing the traffic flow of the packets based on the IP and review the delay, packets sequence rate and TCP round-trip time (RTT). It can also consider TCP/UDP ratios, frames distribution based on their size. In the framework of SDN the traffic measure or analysis is carried out by splitting the data and control plane, it is difficult to process and store the data and to point problem on single server.

LITERATURE SURVEY

- The bernaille proposes a technique based on the [5] observed packets of TCP connection to identify the application. It also provides the statistical data based on the observation of the flow. This technique does not affect the payload and port information.
- McGregor depicts methodology for identifying [6] the traffic characteristics by breaking the packet header into clusters of traffic.
- Younis design and implements on-line flow and [7] performance analysis is carried out based on the traffic on real time test bed and simulated traffic.

PROPOSED WORK

The designing and implementing of the performance analysis of Software Defined Networking is the main focus of this paper. The traffic generated in system that is TCP dump is accepted as the input based on this the flow is identified which is running on network. The traffic analysis and monitoring is carried out by identifying the traffic flow. The errors that occurred from port-based methodology of packet payload and accuracy of the system is classified. Then performance analysis and there characteristics is provided. The required resources and services are given by controller along with flow characteristics.

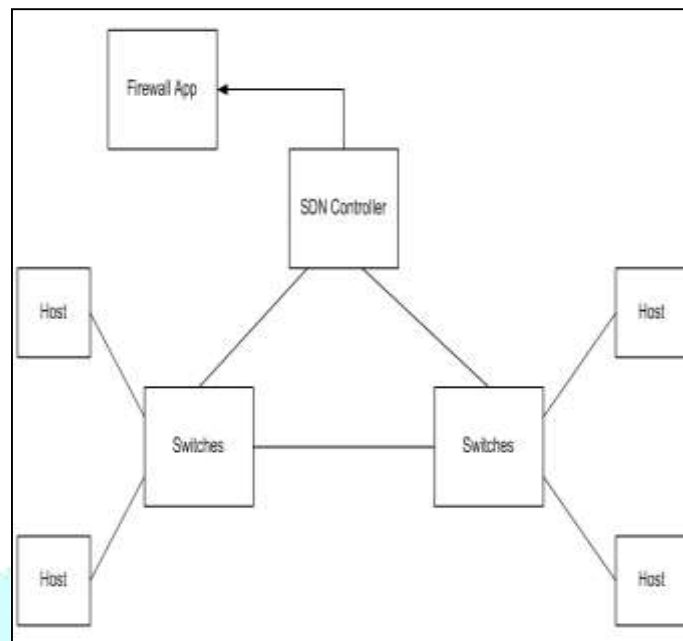


Figure 2. Architectural Design of Software Defined Networking

The traffic generated from the system is captured by using the tool like Wireshark, and huge input from them is taken for performance analysis of the traffic and then flows are identified in the network. Then complete details are given by considering the performance of the SDN regarding network and statistical data is given. The controller gives information of the network resource and services. The Mininet tool is used for realizing the controller part. Firewall application is designed which runs on the application layer for controlling the flow of the network.

CONCLUSION

Software defined networking architectural design is given and performance analysis is carried out based on the traffic flow. The network is generated by the means of emulator known as Mininet and traffic flow is captured using the Wireshark tool for generating the statistical representation of the performance analysis of the SDN network is performed.

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