



## Review On: Sdn, Openflow, Virtual Routing, Cloud Computing

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**Abstract**— *Software defined network emerging technology which makes network programmable and virtualizable. Here simplify network operations and accelerate service delivery. This paper presents an inter-domain routing solution using Open Flow architecture. This paper motive is to provide less complex, less prone to errors and scalable solution. Open Flow network consists of simple flow-based switches in the data path with a remote controller to manage several switches. Here also using the cloud computing technique where the Cloud computing, the IAAS provides services and calculation to users by virtual machines. Cloud computing that have resulted in development of reliable open source tools for managing clouds.*

**Keywords:** *Software defined network, virtual routing, Open flow and Cloud computing.*

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### I. INTRODUCTION

Cloud computing is rapidly increasing in popularity. Elasticity and dynamic service provisioning offered by cloud has attracted a lot of attention. The model has effectively turned cloud computing into a utility and has made it accessible even to startups with limited budget. Large monetary benefits that cloud computing have to offer more and more corporates are now migrating to cloud. It is not only industry. Cloud has received great attention from researchers as it poses many interesting challenges. Innovation in the cloud has become easier with the advent of Open-Stack project. OpenStack is an open source project that enables anyone to run and manage a production or experimental cloud infrastructure. It is a powerful architecture that can be used to provide Infrastructure as a Service to users.

Virtual machines vary with user flexible need which leads to numerous virtual machine versions. Some users may have several versions of virtual machine such as Centos, Windows and Ubuntu. A version of virtual machine may have different configurations. To start a virtual machine as quickly as possible, clouding computing systems prepare a large number of virtual machine images. Cloud scales growths sustainably the storage capacity will grow at a surprising rate.

OpenFlow network consists of compliant switches and OpenFlow controller(s) with unmodified end hosts. It separates the data path over which packets flow from control path that manages the datapath elements. The data path elements are flow-switches which consisting of a flow table and the means to talk to a remote controller using the OpenFlow protocol. A flow is defined as all the packets matching a flow-entry in a switch flow table. Flow entries are quite general and resemble with ACL entries found in firewalls.

### II. RELATED WORK

Ricardo Bennes by suggested the SDN technique which is a potential solution to many network problems. In this paper, presented a new SDN component. This provides inter-domain routing by enabling the communication with two other important components. That is messenger and the switch which were extended to provide the necessary features to achieve this goal. Test results show that the solution proposed in this paper enhances the use of NOX-OpenFlow in order to go beyond enterprise networking. Component is only called when there is no entry in the flow table. When an entry is inserted by the NOX controller, datapaths start doing the forwarding by itself for matching flows without the overhead generated by sending the flows to the controller.

JadNaous, David describes Open Flow on the NetFPGA is one of several reference implemented on different platforms. Their simple OpenFlow implementation is capable of running at line-rate and handling all the traffic that is going through the Stanford Electrical Engineering and Computer Science building. They compare implementation complexity to a basic IPv4 router implementation and basic Ethernet learning switch implementation. They describe the OpenFlow deployment into the Stanford campus and the Internet2 backbone.

Jian Wan, Shuting Han, Jilin Zhang proposed based on image management system of DE duplication. It added DE duplication technology combined with the original basic functions of openstack such as glance image upload, registrations etc to achieve double DE duplication of local-storage and network transmission. Replacing the original image management system glance in openstack. It can achieve better effect. The experiment showed that the proposed system saved at most 80% of the storage space and 30% of image upload time in the image storage server.

Fred Hsu, M. Salman Malik, SoudehGhorbani describe the OpenFlow for cloud computing described an open source project for cloud management and its available OpenFlow plugin does not provide an acceptable level of scalability. Layer out the design for an alternative plugin for Quantum that would side step the scalability issue of the current

OpenFlow plug-in. One instance of a data center management application, which could benefit from our OpenFlow plugin for performing its task and tested its performance. Finally, provided hints about possible future work in this direction.

### III. OPEN FLOW ARCHITECTURE

It is a multivendor standard defined by the Open Networking Foundation (ONF) for implementing SDN in networking equipment. The OpenFlow protocol defines the interface between an OpenFlow Controller and an OpenFlow switch. The OpenFlow protocol allows the OpenFlow Controller to instruct the OpenFlow switch on how to handle incoming data packets.

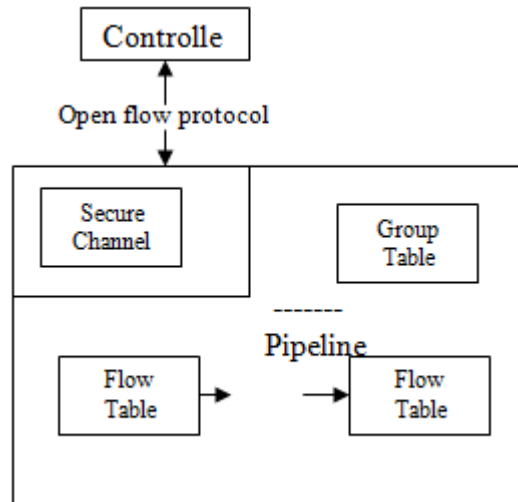


Figure 1 – The OpenFlow Protocol.

The OpenFlow switch may be programmed to:

- (1) The identify and categorize packets from an ingress port based on a various packet header fields.
- (2) Process the packets in various ways that including modifying the header.
- (3) Drop or push the packets to a particular egress port or to the OpenFlow Controller.

The OpenFlow instructions transmitted from an OpenFlow Controller to an Open Flow switch are structured as flows. Individual flow contains packet match fields, flow priority, various counters, packet processing instructions, flow timeouts and a cookie. Incoming packet may be processed by flows in multiple pipelined tables before exiting on an egress port. The OpenFlow protocol standard is evolving quickly with release the current revision at the time of this blog being published.

The OpenFlow Network Architecture consists of three layers:

- (1) One or more OpenFlow virtual and/or physical switches.
- (2) One or two OpenFlow controller(s).
- (3) One or more OpenFlow application(s).

The OpenFlow controller maintains the OpenFlow protocol communications channels to the OpenFlow switches. It maintains a local state graph of the OpenFlow switches and exposes a northbound API to the OpenFlow applications. The northbound API may be viewed as an abstraction of the network and allows the OpenFlow applications to read the state of the network. A real world OpenFlow capable network may consist of only OpenFlow switches or a mixture of OpenFlow switches and traditional switches and routers. The latter network type is called an overlay network. Some OpenFlow applications will require only partial deployment of OpenFlow switches whereas others require a network consisting of only OpenFlow switches.

As SDN is essentially a nascent market, the majority of implementations will be as overlays on existing networks. Mostly applications are discuss in this blog can be introduced as overlays. Multiple applications can be introduced in a staged fashion with new ones building on the foundations laid by the previous applications.

### IV. SDN

SDN stands for Software Defined Networking that has emerged as the industries response to meeting these challenges. Allows networks to react dynamically to changes in usage patterns and availability of network resources. Network architectures can be instantly adjusted the respond to application and user requests and services can be introduced far more quickly, easily and at a lower cost. SDN provides separation between the control plane and data plane functions of networks using a protocol that modifies forwarding tables in network switches.

To optimize networks on the fly and quickly respond to changes in network usage without the need for manually reconfiguring existing infrastructure or purchasing new hardware. It separates the control of network devices from the data they transport and the switching software from the actual network hardware.

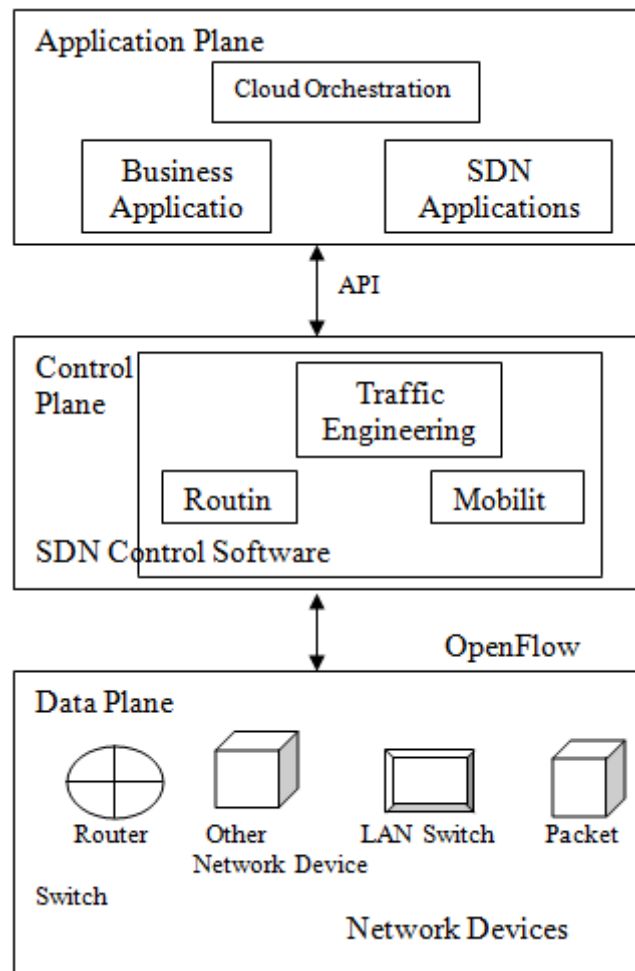


Figure 2 SDN Logical Structure

It also provides an entity, the controller that has a comprehensive view of the entire network and its status and with which switches and applications can communicate in real-time. The controller makes it possible for networks to interact with applications and efficiently reconfigure themselves at need allowing them to implement multiple logical network topologies on a single common network fabric.

In SDN architecture, a switch performs the following functions:

- The switch encapsulates and forwards the first packet of a flow to an SDN controller, enabling the controller to decide whether the flow should be added to the switch flow table.
- The switch forwards incoming packets out the appropriate port based on the flow table. The flow table may include priority information dictated by the controller.
- The switch can drop packets on a particular flow, temporarily or permanently by the controller. Packet dropping can be used for security purposes, curbing Denial-of-Service (DoS) attacks or traffic management requirements.

## V. CONCLUSION

It is possible to quickly create and deploy new applications to orchestrate network traffic flow to meet specific enterprise requirements for performance or security. SDNs, implemented using OpenFlow, provide a powerful vendor independent approach to managing complex networks with dynamic demands. Software-defined network can continue to use many of the useful network technologies already in place such as virtual LANs and an MPLS infrastructure. SDNs and OpenFlow are likely to become commonplace in large carrier networks, cloud infrastructures and other networks that support the use of big data.

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