Assignment No: 01

Assignment Name : Zodiac FX OpenFlow switch .

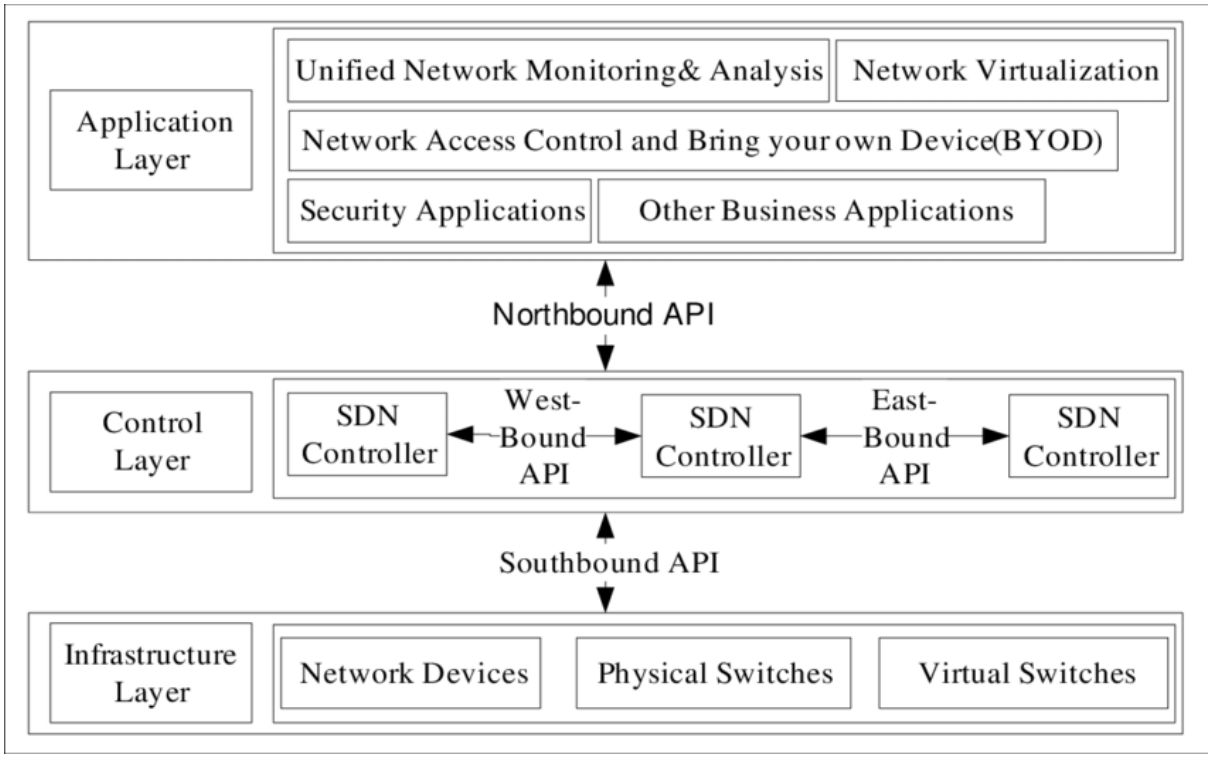
Name : Binodon

ID: IT-17046

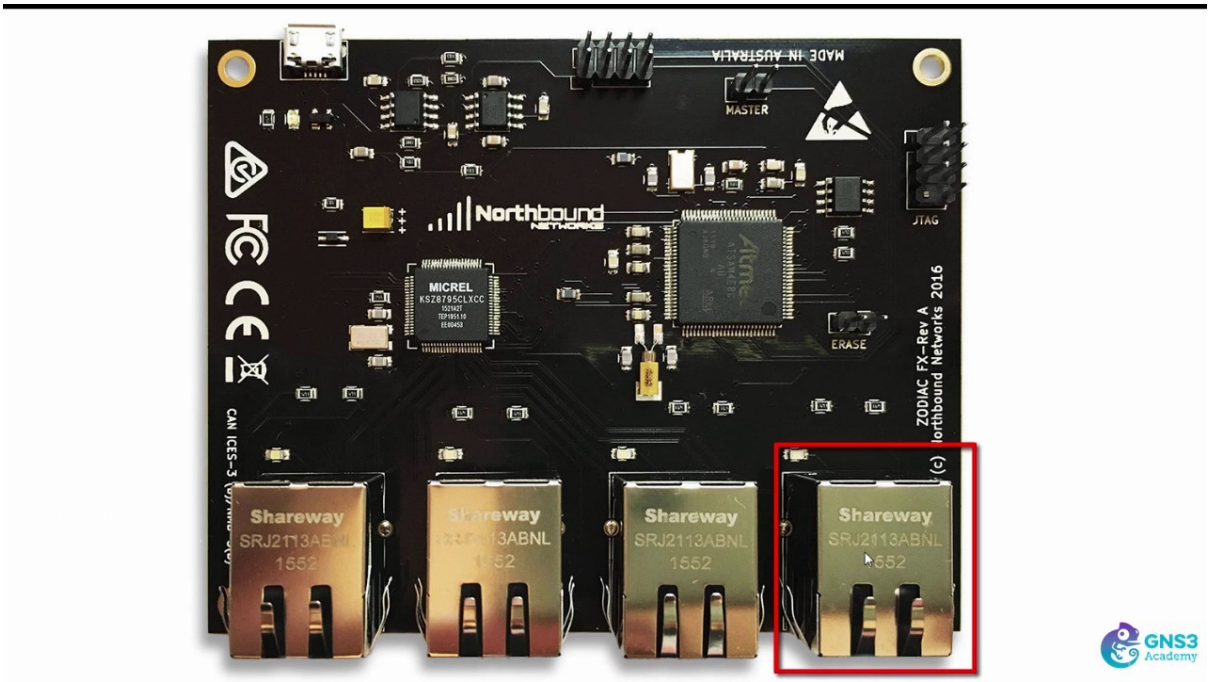
Theory:

Software-defined network (SDN) is a new programmable networking designed to perform tasks easier by enabling network administrators to add network control via a centralized control platform and open interfaces. Common network use procedures such as traffic shifts, troubleshooting and various types of device configuration. Thus devices are needed to reconfigure with the network, in order to create a reaction with events. In this paper, we have developed an SDN testbed using Zodiac FX a hardware switch for OpenFlow experiment. This research is utilized Zodiac FX a hardware switch to test the usage and discuss about the SDN controllers. Ryu controller is configured for testbed development. The main contribution of this paper in threefold as follows: first it provides the configuration of Ryu controller, second, it provides the configuration of Zodiac FX switch and lastly it develops a simple SDN testbed for OpenFlow.

Basic Overview:

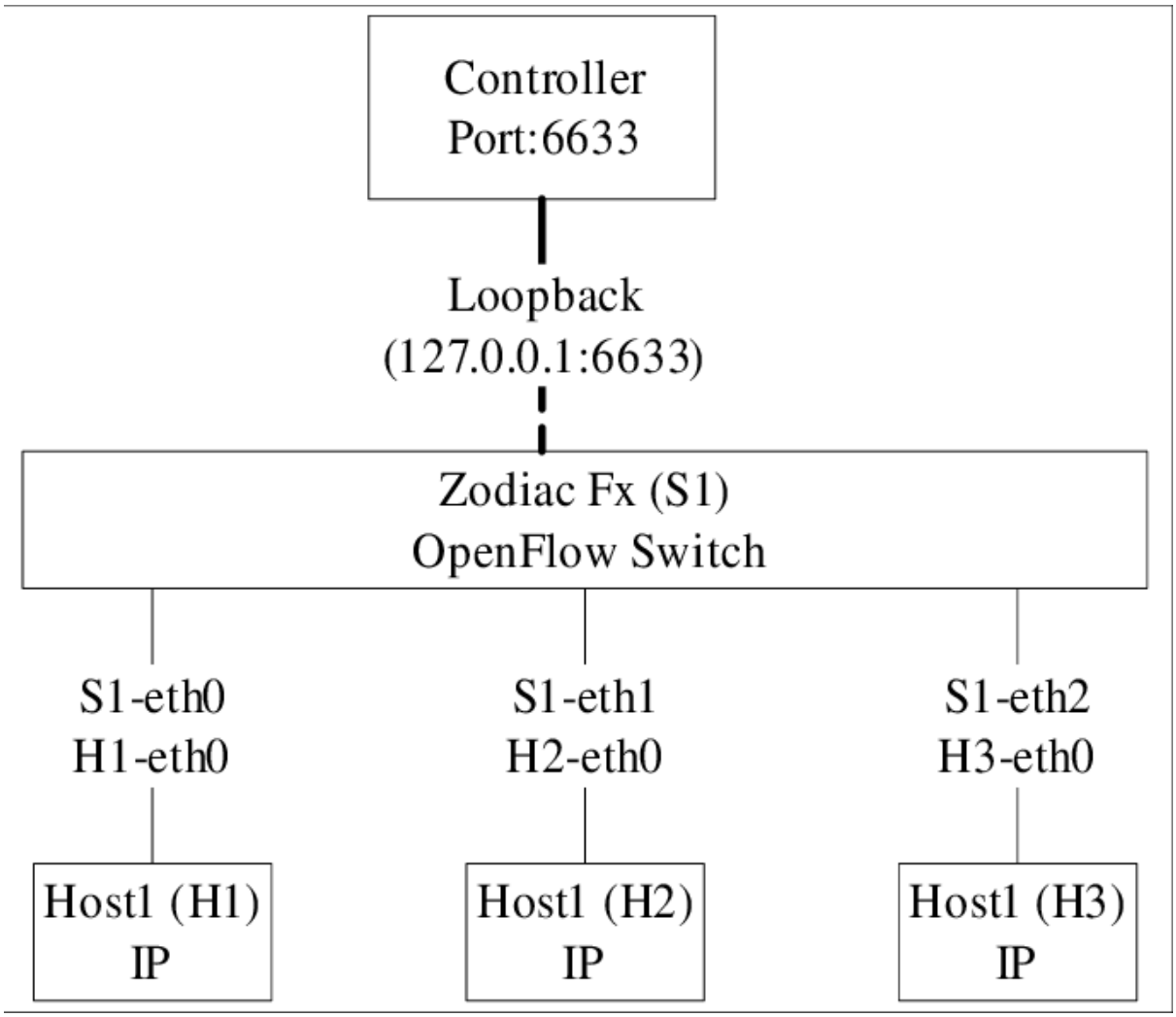


Zodiac FX a hardware Switch:



It has provided firmware code that makes user flexible to generate various own versions. It provides various type of device such as the applications may have Router, Bridge, Load Balancer, Web server, VPN concentrator, TOR client. Zodiac FX command line is available via the USB port. To configure Zodiac FX using gtkterm and process of configuration is described as following, Figure 7 shows the port for Zodiac Fx.

Working Procedure:



To design a simple SDN testbed, we have used Ryu controller open source available codes, and Zodiac FX a hardware switch. Zodiac FX is a four-port hardware, one port is connected directly to Ryu controller while other ports are connected to hosts, figure 9 shows the connectivity of Ryu controller and Zodiac FX.

Open Flow experiments are conducted by researchers often used hardware/Open Flow Switch issued by vendors. Actually, the performance of Open Flow switch software-based (starting while switching software-based) was only tested on a laboratory scale.

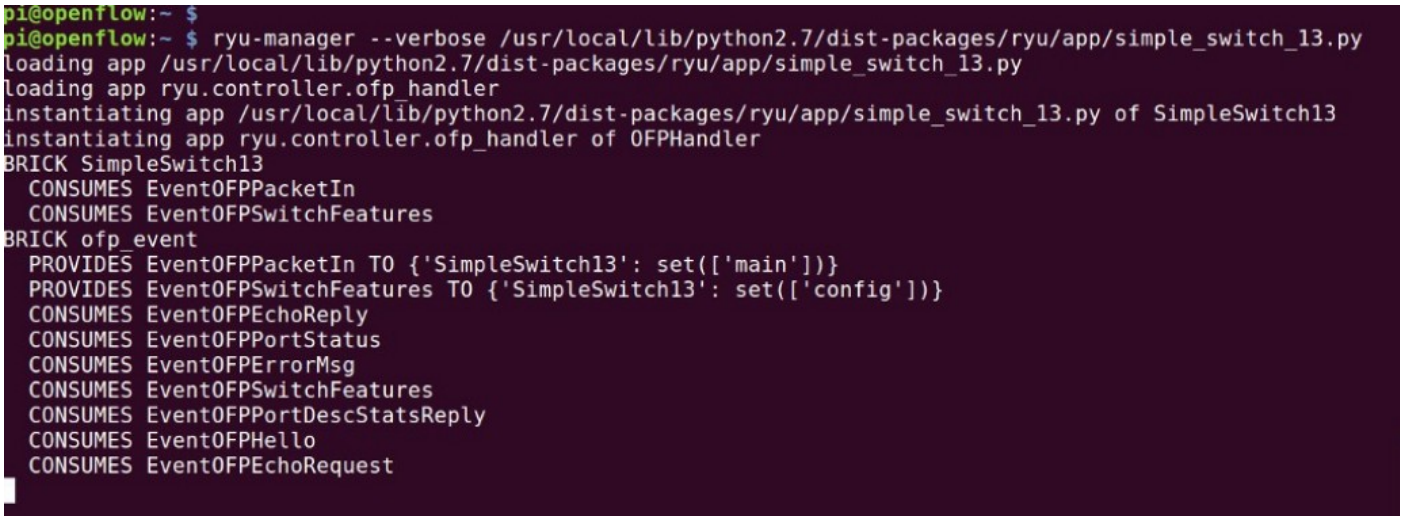
Software-defined network (SDN) is a new programmable networking designed to perform tasks easier by enabling network administrators to add network control via a centralized control platform and open interfaces. Common network use procedures such as traffic shifts, troubleshooting and various types of device configuration.

Description:

The control layer contains a main entity known as a controller that can be used to act as the heart for the entire SDN infrastructure. The controller is responsible for controlling the network devices in the data layer while injecting different applications from the application layer. The controller can communicate with another controller connected through east and west bound interfaces. However, the OpenFlow protocol uses southbound interface that is further used to manage communication between switches and the controller. OpenFlow is used by different researchers to perform their experiments as SDN is in its initial stage of implementation. The SDN idea is based on separating control from the network forwarding features such as switches and routers. The basic principle of the SDN is allied with OpenFlow protocol. OpenFlow is a protocol which has been designed by academia at Stanford University in 2008. OpenFlow has proposed at the initial stage in , which it is executable available for researchers to perform more experiments . Open Networking Foundation (ONF), an open source EAI Endorsed

SDN has introduced an external and programmable network's control plane, which is modeled as a simple and open interface to the network data plane which includes an Application layer, Control Layer and Data Layer. The most important part of SDN is northbound-API applications. This may offer information to the control plane that can be controlled the data plane. In a broader sense, the control plane can be influenced to enhance the network control for better improvement in the user supposed Quality-of-Experience (QoE) by altering the forwarding performance of switches or by assigning more network's resources to a particular flow. These administrative tasks are possibly on short time scales as well as a per-flow basis. The main contribution of this paper is to design a simple SDN testbed using Zodiac FX via Ryu open source SDN controller. Zodiac FX consists of four ports network implementation board and considered as a smallest network implement board to perform modeling and designing for SDN services and applications. The main purpose is to use RYU for development a SDN testbed that Ryu supports several protocols and deal with the network devices, such as OpenFlow, Netconf, OF-config, etc.

Installation:



Risks and challenges

As with any new hardware device there are a number of manufacturing and component supply risks. These include shortages and/or delays sourcing components, manufacturing delays or faults and possible issues with shipping. In addition, there are also inherent risks with developing a new product such as unforeseen difficulties with software development and possible design changes required due to standards compliance. To reduce these risks we are including a beta test program to ensure proper real world testing of the hardware. As the firmware is user updatable any software issues that arise after shipping can be easily corrected with updates.

Conclusion:

It can say that SDN is more flexible than traditional network and main advantage of SDN is a cost efficient and programmable. It is an Open Flow switch designed for teaching purposes as well as the idea of allowing people to create their own applications using accessible hardware,Zodiac FX can be used to perform more experiments and examine the performance via Rya OpenFlow controller and other SDN controllers. It is observed that the major limitation of SDN controllers that if any active controller fails it can rapidly break down the entire network.