Section 3: Introduction to Mininet

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Simulate a simple network using Mininet

Software Defined Network (SDN)

Wikipedia:

(SDN) technology is an approach to network management that enables dynamic, programmatically efficient network configuration in order to improve network performance and monitoring making it more like cloud computing than traditional network management.

Controller   Switch

Control Plane → OpenFlow → Data Plane
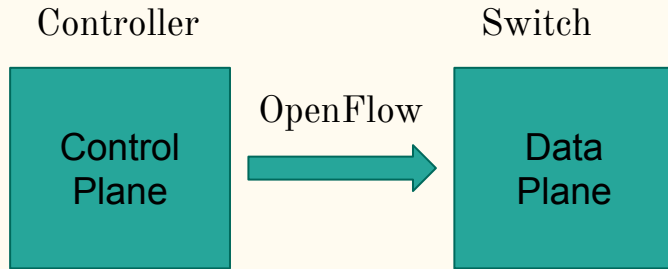
Make Decisions:
1. How to forward data.
2. Order to send data.

Perform Actions:
1. Forward
2. Route

What is Mininet & Pox?

Mininet:

A software that creates a virtual network.

We can set up switches, connect components, and ping, etc.

Pox:

A Python-based SDN controller platform geared towards research and education.

Helpful Links:

See the last slide.

Mininet: Download & Install

1. Download VirtualBox: https://www.virtualbox.org/wiki/Downloads

   (We expect that you have already downloaded and installed VirtualBox!)

2. Download Mininet: http://mininet.org/download/
3. Import Mininet into VirtualBox
4. Log into Mininet: Username=mininet, Password=mininet
5. Set up VirtualBox SSH (optional) (Try scp and sshfs as well!):

   Network => Network Settings => Advanced => Port Forwarding

   Rule name = SSH, Host port = 2222, Guest port = 22

Project 2 Part 1

1. Preparation: Download project2.zip and install unzip

    $ sudo apt-get install unzip

    $ wget
    https://courses.cs.washington.edu/courses/cse461/19au/assignments/project2/project2.zip

    $ unzip project2.zip

2. Try running part1 code: $ sudo python 461_mininet/topos/part1.py

Part 1: Build A Simple Network

Goal of part 1:
Modify file part1.py to create the following topology.

Run part 1:
$ sudo mn --custom ~/461_mininet/topos/part1.py --topo part1
$ sudo python 461_mininet/topos/part1.py

Some useful Mininet commands:

1. dump (dump info about all nodes)
2. pingall (Literally, ping all the connections)
3. ping (ping the connection h1 and h2)
4. iperf (Test the bandwidth between two hosts)
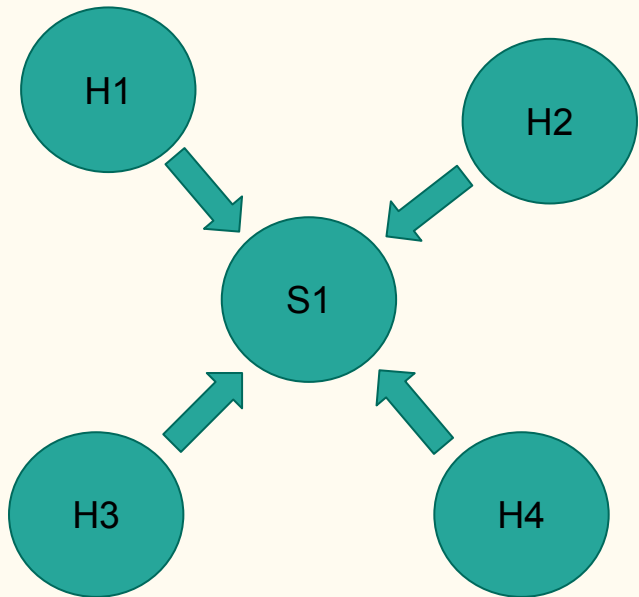
Walk Through Part 1

Watch how the TA creates the network and try it yourself!

Resources About Mininet & Pox

Mininet:

➤ https://github.com/mininet/mininet/wiki/Documentation

➤ https://github.com/mininet/mininet/wiki/Introduction-to-Mininet#creating

➤ http://mininet.org/walkthrough/

Pox:

➤ https://github.com/mininet/openflow-tutorial/wiki/Create-a-Learning-Switch#Controller_Choice_POX_Python

➤ https://haryachyy.wordpress.com/2014/06/14/learning-pox-openflow-controller-proactive-approach/