Computer Networks

Project 2 & HW 1

By Qian Yan (qiany7@)

How was the Surprise Quiz?

- ▶ Easy?
- ▶ Hard?
- ▶ Review on Hamming Distance

UNIVERSITY *of* WASHINGTON

Review: Hamming Distance

▶ The number of bit flips needed to change D1 to D2

▶ **Hamming distance of a coding** is the minimum distance between any pair of codewords (bit-strings) that cannot be detected

  ▶ Parity-bit encoding has a hamming distance of 2

  ▶ Error detection: n + 1

  ▶ Error correction: 2n + 1

Software Defined Network (SDN)

Controller

Switch

| Control Plane | OpenFlow → | Data Plane |
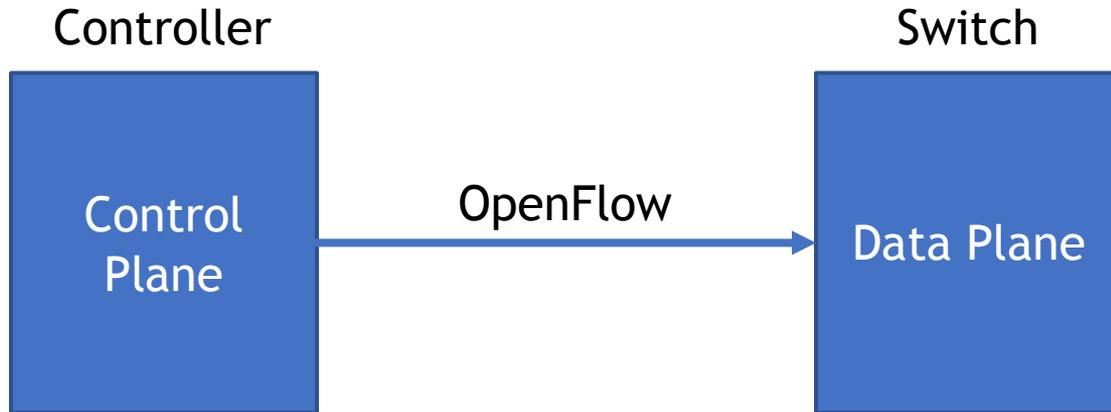
- Making decisions
  - How to forward data
  - Order to send data
  - …

- Perform actions
  - Forward
  - Route

UNIVERSITY of WASHINGTON

Mininet & Pox

▶ Mininet: a software that creates a virtual network

    ▶ Set up switches

    ▶ Connect components

    ▶ Ping from anyone of them

    ▶ …

▶ Pox

    ▶ a Python-based SDN controller platform geared towards research and education

UNIVERSITY of WASHINGTON

Mininet: Download & Install

▶ Mininet: available a virtual machine image
  ▶ Download VirtualBox
  ▶ Download Mininet Image
    ▶ Username & password: mininet
▶ Demo

UNIVERSITY *of* WASHINGTON

# VirtualBox: ssh & sshfs (optional)

▶ For easier access, we can setup ssh connection to our virtual machine

▶ Port forwarding:

  ▶ Forwarding one of the localhost port to port 22 (ssh) on the virtual machine

  ▶ ssh mininet@127.0.0.1 -p 3000

▶ sshfs can be used to mount a remote fs to your local fs

  ▶ sshfs -p 3000 mininet@127.0.0.1:/home/mininet/cse461 ~/attu/

http://blog.johannesmp.com/2017/01/25/port-forwarding-ssh-from-virtualbox/

UNIVERSITY *of* WASHINGTON

Project 2: Part 1

▶ Your task in part one is to modify part1.py to represent the following network topology:

W UNIVERSITY *of* WASHINGTON
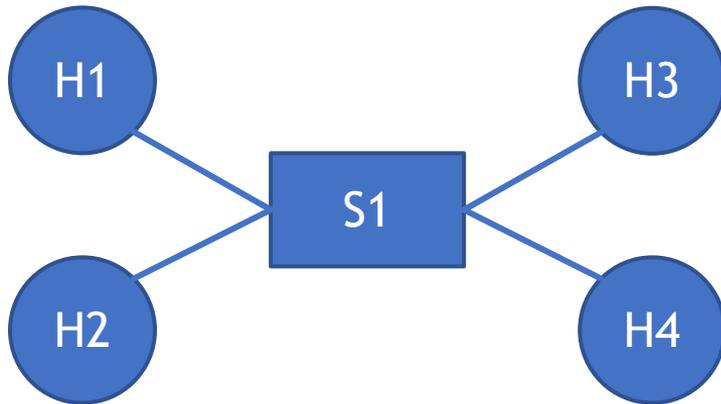
Project 2: Part 1

▶ Run:
  - ▶ sudo mn --custom ./topos/part1.py --topo part1
  - ▶ sudo python part1.py

▶ dump, pingall, <h1> ping <h2>

▶ But most helpful ones are:
  - ▶ help
  - ▶ help ping

UNIVERSITY of WASHINGTON

Homework 1: Q20(b)

Hosts A and B are each connected to a switch S.

Bandwidth: 100-Mbps

Propagation delay on each link is 20 μs

S is a store-and-forward device; it begins retransmitting a received packet 35 μs after it has finished receiving it

Calculate the total time required to transmit 10,000 bits from A to B as two 5000-bit packets sent one right after the other

UNIVERSITY *of* WASHINGTON

Homework 1: Q20(b)

$$\frac{10{,}000 \text{ bit}}{100 \text{ Mbps}} + 20 \text{ μs} + 35 \text{ μs} + \frac{5{,}000 \text{ bit}}{100 \text{ Mbps}} + 20 \text{ μs} = 225 \text{ μs}$$

UNIVERSITY *of* WASHINGTON

END

12