Spring 2015: EE 555 Project

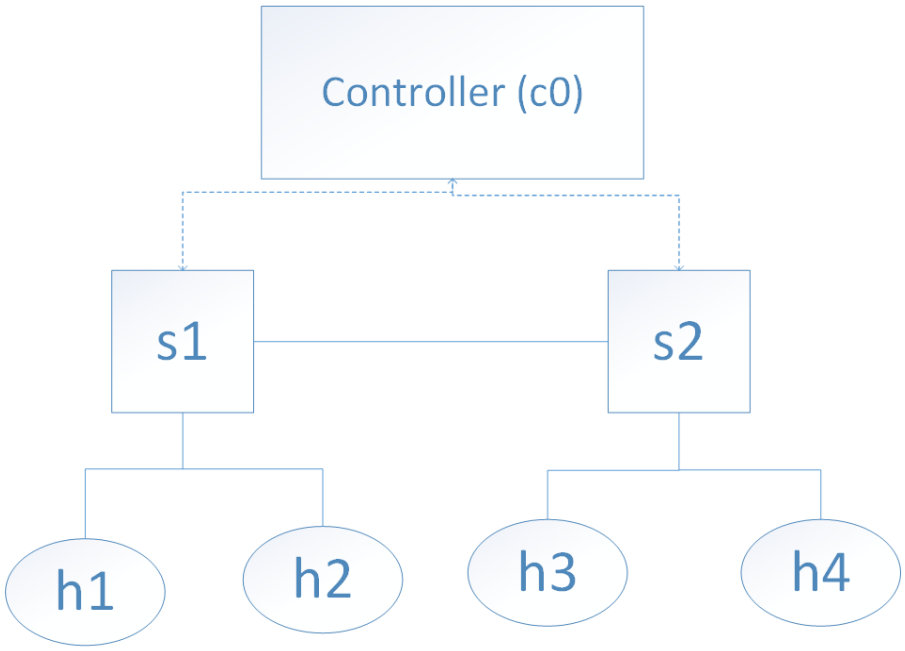
Introduction

The aim of this project is to gain familiarity with OpenFlow and Mininet. OpenFlow is a communications protocol governing the communication between a controller and the switch an SDN environment [1]. Mininet allows you to create a virtual SDN network on your laptop in order to run network experiments [2].

Project Description

The project is divided into two parts. For Part 1, complete the OpenFlow Tutorial until (and including) the Router Exercise.

For Part 2, repeat the Router Exercise but with the topology given below:



Use the POX controller for both parts.

Submission Guidelines

Complete this project in teams of 2-3 (preferably 3).

- ❏ Each team should submit a single zip file on Blackboard.
- ❏ The zip file must contain two folders, 'Part 1' and 'Part 2', that contain your code for parts 1 and 2 of the project.
- ❏ Each folder must contain a README file (ASCII only. No MS-Word/PDF) that contains a detailed description of your code files and instructions on running them.
- ❏ Submit a report (PDF) that describes the steps taken in completing this project. Include implementation details and/or problems faced, but DO NOT include the entire code (snippets are allowed) in the report.

Grading and Testing

Points will be awarded based on the following:

1. The zip file strictly follows the submission guidelines.
2. The README file description is adequate.
3. The project report is comprehensive.
4. The submitted code satisfies the tests.
5. The submitted code is readable.

You should test the code yourself before submission. The tests are fairly simple:

- ❏ Attempts to send from a host to an unknown address range should yield an ICMP destination unreachable message.
- ❏ Packets sent to hosts on a known address range should have their MAC dst field changed to that of the next-hop router.
- ❏ The router should be pingable, and should generate an ICMP echo reply in response to an ICMP echo request.
- ❏ All hosts must be connected to each other. This can be verified using 'pingall'.

Flow Mods isn't necessary. But you get bonus points if it works for both parts 1 and 2.

References

1. Nick McKeown, Tom Anderson, Hari Balakrishnan, Guru Parulkar, Larry Peterson, Jennifer Rexford, Scott Shenker, and Jonathan Turner. 2008. OpenFlow: enabling innovation in campus networks. *SIGCOMM Comput. Commun. Rev.* 38, 2 (March 2008), 69-74. DOI=10.1145/1355734.1355746 http://doi.acm.org/10.1145/1355734.1355746

2. Nikhil Handigol, Brandon Heller, Vimal Jeyakumar, Bob Lantz, and Nick McKeown. *Reproducible Network Experiments using Container-Based Emulation*. CoNEXT 2012, December 10-13, 2012, Nice, France.