Assignment 1

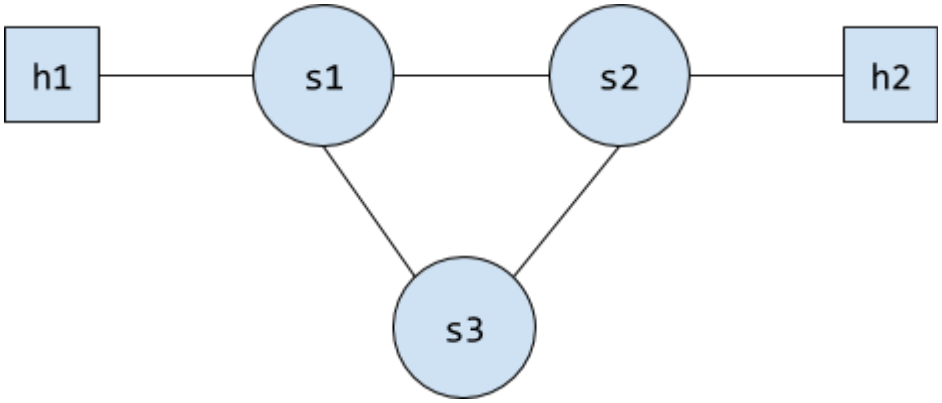
21.01.2016

Objective:

To understand the concept of network virtualization via network namespace, and additionally to learn how Spanning Tree Protocol (STP) helps in Layer 2 Forwarding via L2 Switches.

Tasks:

1. Create the following topology using linux network namespace (netns) and openvswitch.



   h1, h2 - Hosts
   s1, s2, s3 - Switches

2. Write two programs udpclient and udpserver using socket programming. These are simple socket programs that utilize SOCK_DGRAM to implement a UDP echo client-server application. The udpclient sends an ECHO REQUEST, and on receiving the message, the udpserver returns back with an ECHO REPLY message. The udpclient sends the ECHO REQUEST at every **ONE** second.
3. Attach udpclient at h1 and udpserver at h2
4. Now execute the udpclient at udpserver at two different scenarios:
   a. **Scenario 1:** S1, S2 and S3 are NOT configured with the spanning tree protocol (STP).
   b. **Scenario 2:** S1, S2 and S3 are configured with the spanning tree protocol (STP).
      i. Check openvswitch documentation to learn how to configure a switch using STP
5. Attach wireshark instances to capture the packets from different hosts and switches

What difference do you observe in the packet forwarding behavior for the above two scenarios? Write a small report mentioning your observations. Your observations should be backed by necessary packet capturing screenshots from wireshark.

Submission Instructions:

Submission Deadline: 28 January, 2016 11:59 PM IST (No extension will be granted)

Create a zip file containing,

I. **the scripts** -- essentially the sequence of commands for ip netns and openvswitch to create this topology and execute the experiments (Separate scripts for Scenario 1 and Scenario 2)
II. **the source code** for udpclient and udpserver program -- this can be written in any of your favourite programming languages that support socket programming
III. **the write-up** containing your explanation along with wireshark screenshots

Every individual files should contain **the name and roll numbers** of all the group members.

Create a single zip file and one of the members of every group should upload it in TutorSpace.

If you face any problem in uploading the file at TutorSpace, mail the zip file to the instructor (sandipc@cse.iitkgp.ernet.in) with a cc to sumitros@gmail.com