Computer Comm & Networks - ITCS 6166

Assignment - 3 **Due on**: **3/19/2021 11:59pm**

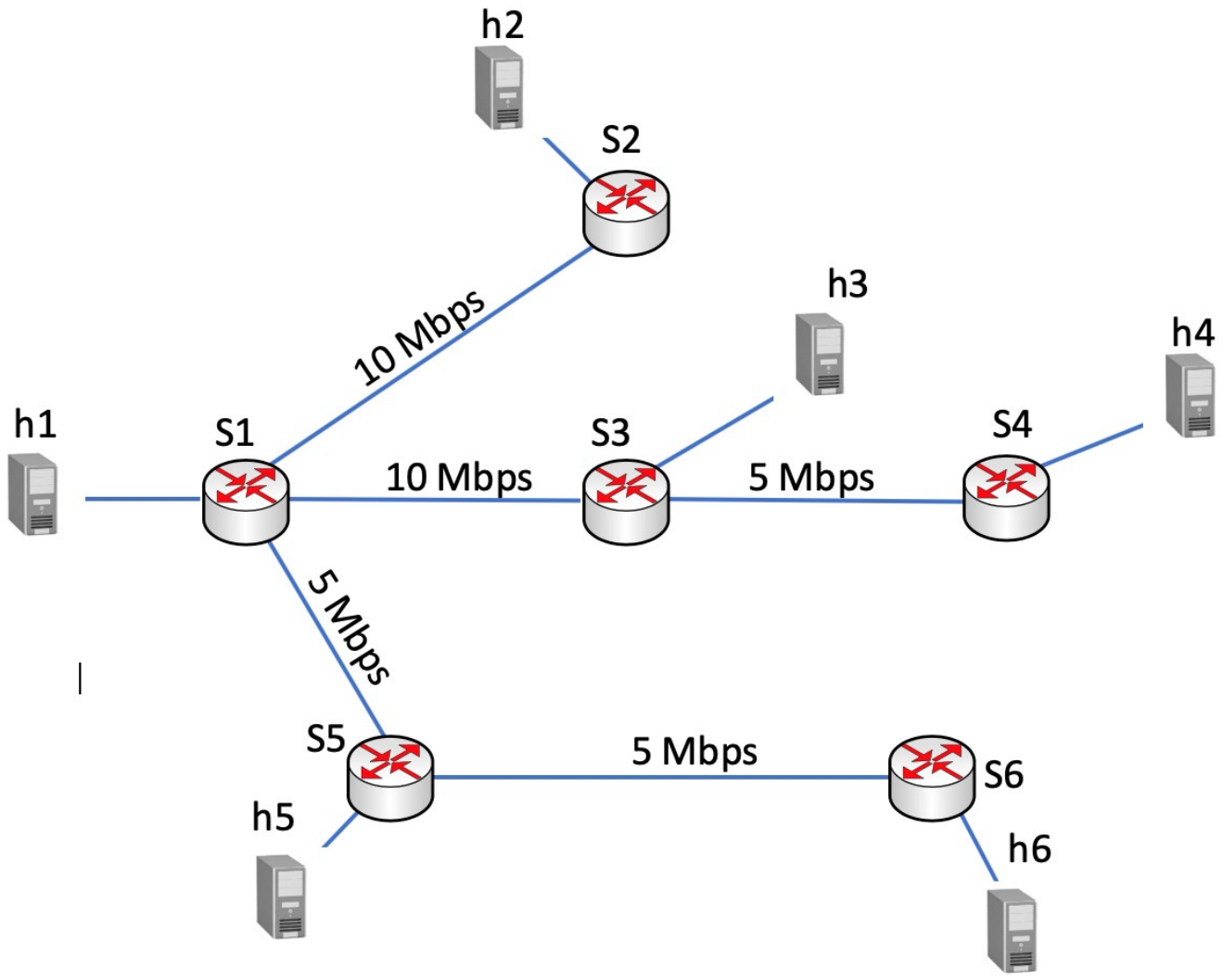
Goal: To implement RYU controller application for gathering network topology information.

Discussion Topic: Assignment – 3: RYU TOPOLOGY

Overview:

SDN controller is the brain of the network. It is essential for the SDN network controller to have complete view of the underlying network in the form a topology. In previous assignment, you created a network topology using Mininet API and local controller. Your local controller, then created the forwarding table based when you injected traffic into the network while performing your performance test.

In this assignment, you will use the topology shown below and RYU controller as your RemoteController.



Your objective is to create a RYU topology application that can learn the network topology you created using Mininet API.

Milestones:

1. Your application should learn the switches, links and hosts by observing the Packet_In event. To generate Packet_In event, use mininet pingall function.
2. Print the network topology to show links, hosts and switches. **(20 pts)**
3. Now, you have the network topology. Using iperf, measure the bandwidth(bw) between hosts and include the resulting bw as cost of the link. Since the link from host to switch is unconstrained, the bw you measure between two adjacent hosts will be bandwidth of links connecting two adjacent switches of the hosts. **(20 pts)**
4. Print the network topology along with list costs. **(10 pts)**

Submitting your Code:

- You need to turn-in 2 separate python files for topology and RYU application, with the following naming convention yourname_topo.py and yourname_ryu.py
- Take snapshots of your milestones and add them to word file. Include the word file and python files as a zip file. Name your zip file following the below convention:
  - yourname_files.zip
- Submit your zip file in Canvas submission link

References:

1. http://mininet.org/api/hierarchy.html
2. https://github.com/mininet/mininet/wiki/Documentation
3. https://www.tutorialspoint.com/python/
4. https://osrg.github.io/ryu-book/en/Ryubook.pdf
5. https://osrg.github.io/ryu-book/en/html/switching_hub.html