BIRLA INSTITUTE OF TECHNOLOGY & SCIENCE, PILANI
WORK INTEGRATED LEARNING PROGRAMS

SOFTWARE DEFINED NETWORKING
SSZG580

ASSIGNMENT 1

STUDENT DETAILS:
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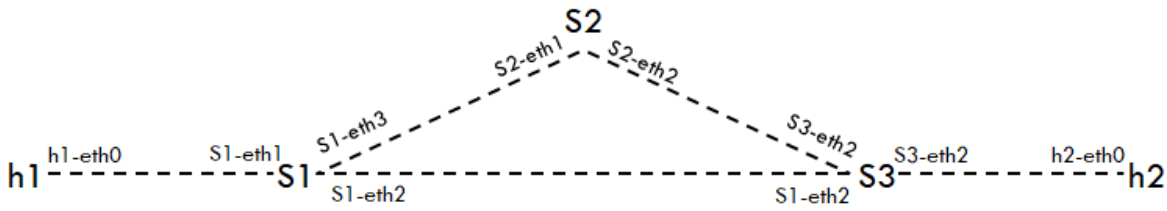
2020MT13010

Program to create following Virtual Topology using mininet



Python Code:

```
"""
Software Defined Networking (SSZG580)
Assignment 1
Student Name: K Ravi Kumar Reddy
Student ID: 2020MT13010
"""

from mininet.net import Mininet
from mininet.node import Host, OVSSwitch, Controller, RemoteController
from mininet.cli import CLI
from mininet.link import TCLink
from mininet.log import setLogLevel, info
from mininet.topolib import TreeTopo

def SDN_Asgmt():
    net = Mininet(topo=None, build=False, ipBase='10.0.0.0/8', controller=RemoteController)

    info("\n> Adding Controller\n")
    c0 = net.addController(name='c0', controller=RemoteController, ip="10.0.0.200/8",
port=6633)
```

```
    info("\n>> Adding Switches\n")
    s1_switch = net.addSwitch('s1', cls=OVSSwitch, stp=1)
    s2_switch = net.addSwitch('s2', cls=OVSSwitch, stp=1)
    s3_switch = net.addSwitch('s3', cls=OVSSwitch, stp=1)

    info("\n>> Adding Hosts\n")
    h1_node = net.addHost('h1', cls=Host, ip='10.0.0.2/8', defaultRoute='h1-eth0')
    h2_node = net.addHost('h2', cls=Host, ip='10.0.0.3/8', defaultRoute='h2-eth0')

    info("\n>> Adding Links\n")
    net.addLink(h1_node, s1_switch, cls=TCLink)
    net.addLink(s1_switch, s3_switch, cls=TCLink)
    net.addLink(s3_switch, h2_node, cls=TCLink)
    net.addLink(s1_switch, s2_switch, cls=TCLink)
    net.addLink(s2_switch, s3_switch, cls=TCLink)

    net.build()
    c0.start()

    s1_switch.start([c0])
    s2_switch.start([c0])
    s3_switch.start([c0])

    net.start()

    CLI(net)

if __name__ == '__main__':
    print ("-------------------------------------")
    print ("SDN Assignment 1 | BITS WILP Program")
    print ("-------------------------------------")
    print ("Student Name: K Ravi Kumar Reddy")
    print ("Student ID: 2020MT13010")
    print ("-------------------------------------\n")
    setLogLevel('info')
    SDN_Asgmt()
```

Output:

```
mininet@rreddyk-ubuntu-net:~$ sudo python sdn-assignment.py
-------------------------------------
SDN Assignment 1 | BITS WILP Program
-------------------------------------
Student Name: K Ravi Kumar Reddy
Student ID: 2020MT13010
-------------------------------------


> Adding Controller
Unable to contact the remote controller at 10.0.0.200/8:6633

>> Adding Switches
```

```
>> Adding Hosts

>> Adding Links
*** Configuring hosts
h1 h2
*** Starting controller
c0
*** Starting 3 switches
s1 s2 s3 ...
*** Starting CLI:
mininet>
mininet>
mininet> net
h1 h1-eth0:s1-eth1
h2 h2-eth0:s3-eth2
s1 lo:  s1-eth1:h1-eth0 s1-eth2:s3-eth1 s1-eth3:s2-eth1
s2 lo:  s2-eth1:s1-eth3 s2-eth2:s3-eth3
s3 lo:  s3-eth1:s1-eth2 s3-eth2:h2-eth0 s3-eth3:s2-eth2
c0
mininet>
mininet> nodes
available nodes are:
c0 h1 h2 s1 s2 s3
mininet>
mininet> links
h1-eth0<->s1-eth1 (OK OK)
s1-eth2<->s3-eth1 (OK OK)
s3-eth2<->h2-eth0 (OK OK)
s1-eth3<->s2-eth1 (OK OK)
s2-eth2<->s3-eth3 (OK OK)
mininet>
mininet> dump
<Host h1: h1-eth0:10.0.0.2 pid=1692>
<Host h2: h2-eth0:10.0.0.3 pid=1694>
<OVSSwitch s1: lo:127.0.0.1,s1-eth1:None,s1-eth2:None,s1-eth3:None pid=1681>
<OVSSwitch s2: lo:127.0.0.1,s2-eth1:None,s2-eth2:None pid=1684>
<OVSSwitch s3: lo:127.0.0.1,s3-eth1:None,s3-eth2:None,s3-eth3:None pid=1687>
<RemoteController c0: 10.0.0.200/8:6633 pid=1674>
mininet>
mininet>
mininet> pingall
*** Ping: testing ping reachability
h1 -> h2
h2 -> h1
*** Results: 0% dropped (2/2 received)
mininet>
mininet> exit
mininet@rreddyk-ubuntu-net:~$
```