Mawlana Bhashani Science and Technology University

Lab-Report

Report No: 06

Course code: ICT-4202

Course title: Wireless and Mobile Communication Lab

Date of Performance: 25.09.2020

Date of Submission: 30.09.2020

Submitted by

Name: Amrita kamkar

ID: IT-14060

4th year 2nd semester

Session: 2013-2014

Dept. of ICT

MBSTU.

Submitted To

Nazrul Islam

Assistant Professor

Dept. of ICT

MBSTU.

Experiment No: 06

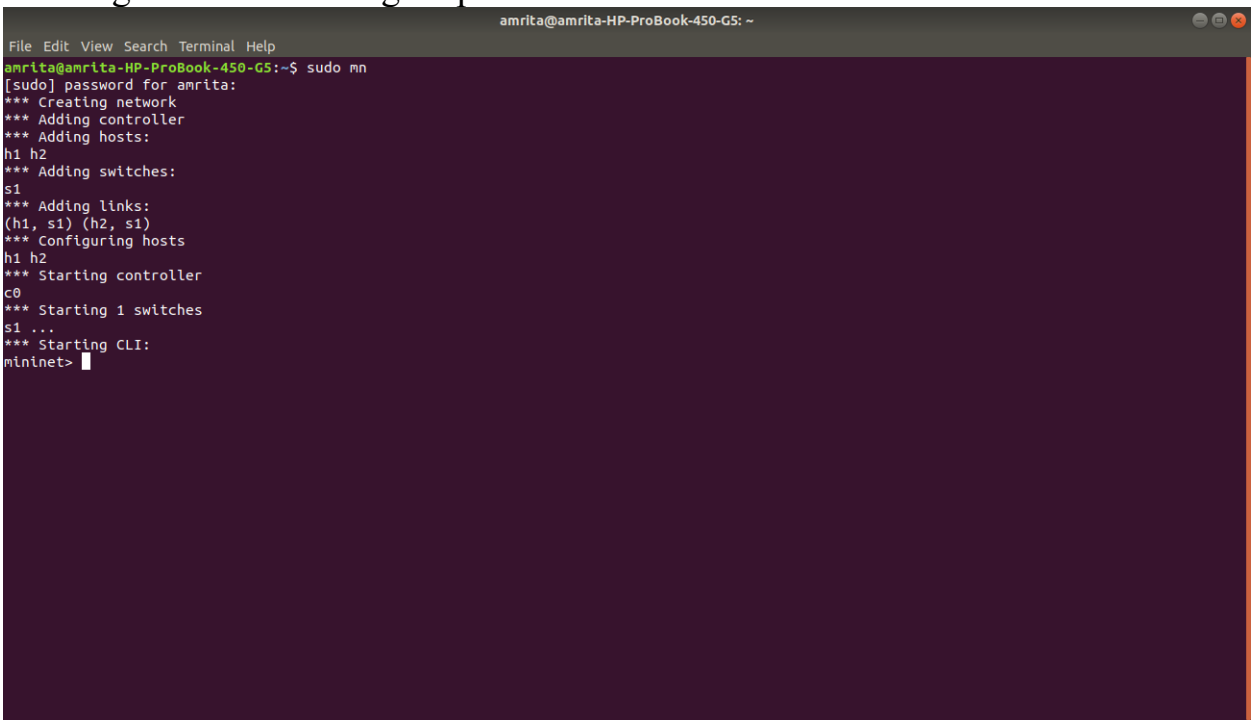
Experiment name: Switching an interface to move a host around a network using mininet.

Objectives: In this lab we are going to work with mininet to combine several networks in one. For this we need to install the mininet first.It can work in windows,linux,ubundu.

Working Procedure After installation of mininet: After installing the mininet, to check whether it is okay to work with we can write-

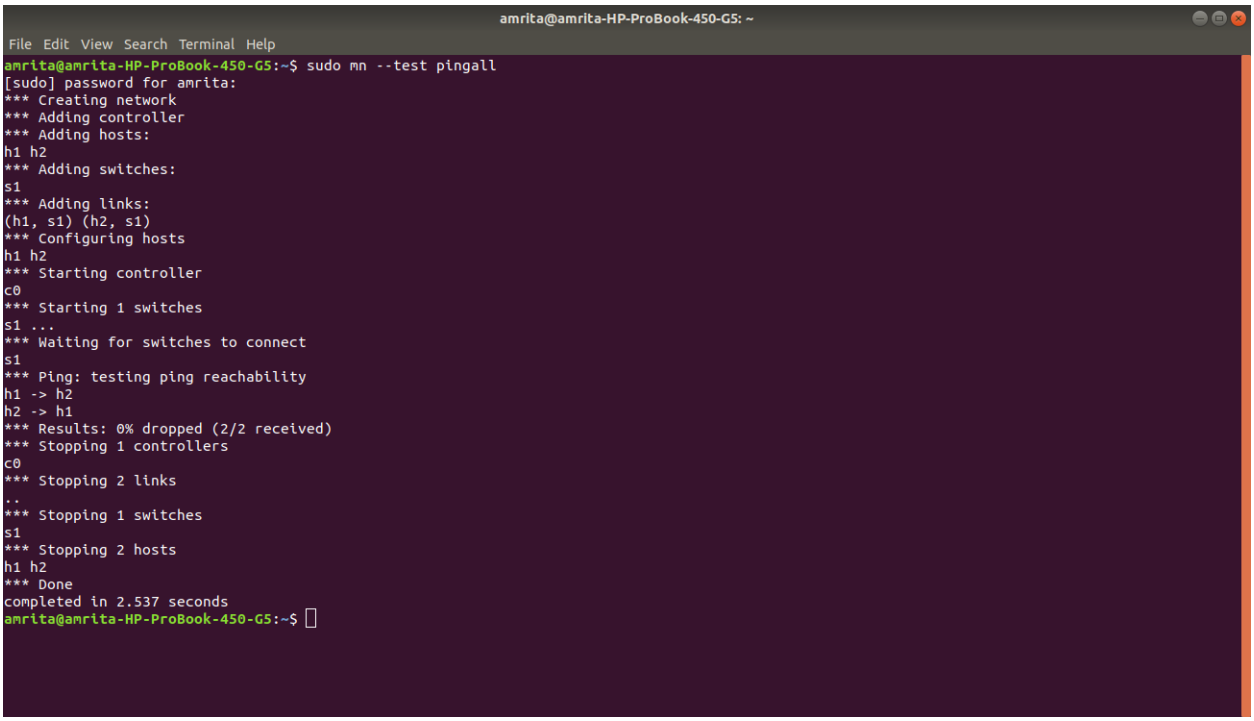
Sudo mn

Which gives the following output-



Another one is to create ping between two networks

Sudo mn -- test pingall



From these it's clear mininet can work now.The source code we are going to use is-

Pseudo code:

```
from mininet.net import Mininet
from mininet.node import OVSSwitch
from mininet.topo import LinearTopo
from mininet.log import info, output, warn, setLogLevel

from random import randint


class MobilitySwitch( OVSSwitch ):
    "Switch that can reattach and rename interfaces"

    def delIntf( self, intf ):
        "Remove (and detach) an interface"
        port = self.ports[ intf ]
        del self.ports[ intf ]
        del self.intfs[ port ]
        del self.nameToIntf[ intf.name ]

    def addIntf( self, intf, rename=False, **kwargs ):
        "Add (and reparent) an interface"
        OVSSwitch.addIntf( self, intf, **kwargs )
```

```
        intf.node = self
        if rename:
            self.renameIntf( intf )

    def attach( self, intf ):
        "Attach an interface and set its port"
        port = self.ports[ intf ]
        if port:
            if self.isOldOVS():
                self.cmd( 'ovs-vsctl add-port', self, intf )
            else:
                self.cmd( 'ovs-vsctl add-port', self, intf,
                          '-- set Interface', intf,
                          'ofport_request=%s' % port )
            self.validatePort( intf )

    def validatePort( self, intf ):
        "Validate intf's OF port number"
        ofport = int( self.cmd( 'ovs-vsctl get Interface', intf,
                                'ofport' ) )
        if ofport != self.ports[ intf ]:
            warn( 'WARNING: ofport for', intf, 'is actually', ofport,
                  '\n' )

    def renameIntf( self, intf, newname='' ):
        "Rename an interface (to its canonical name)"
        intf.ifconfig( 'down' )
        if not newname:
            newname = '%s-eth%d' % ( self.name, self.ports[ intf ] )
        intf.cmd( 'ip link set', intf, 'name', newname )
        del self.nameToIntf[ intf.name ]
        intf.name = newname
        self.nameToIntf[ intf.name ] = intf
        intf.ifconfig( 'up' )

    def moveIntf( self, intf, switch, port=None, rename=True ):
        "Move one of our interfaces to another switch"
        self.detach( intf )
        self.delIntf( intf )
        switch.addIntf( intf, port=port, rename=rename )
        switch.attach( intf )


def printConnections( switches ):
    "Compactly print connected nodes to each switch"
    for sw in switches:
```

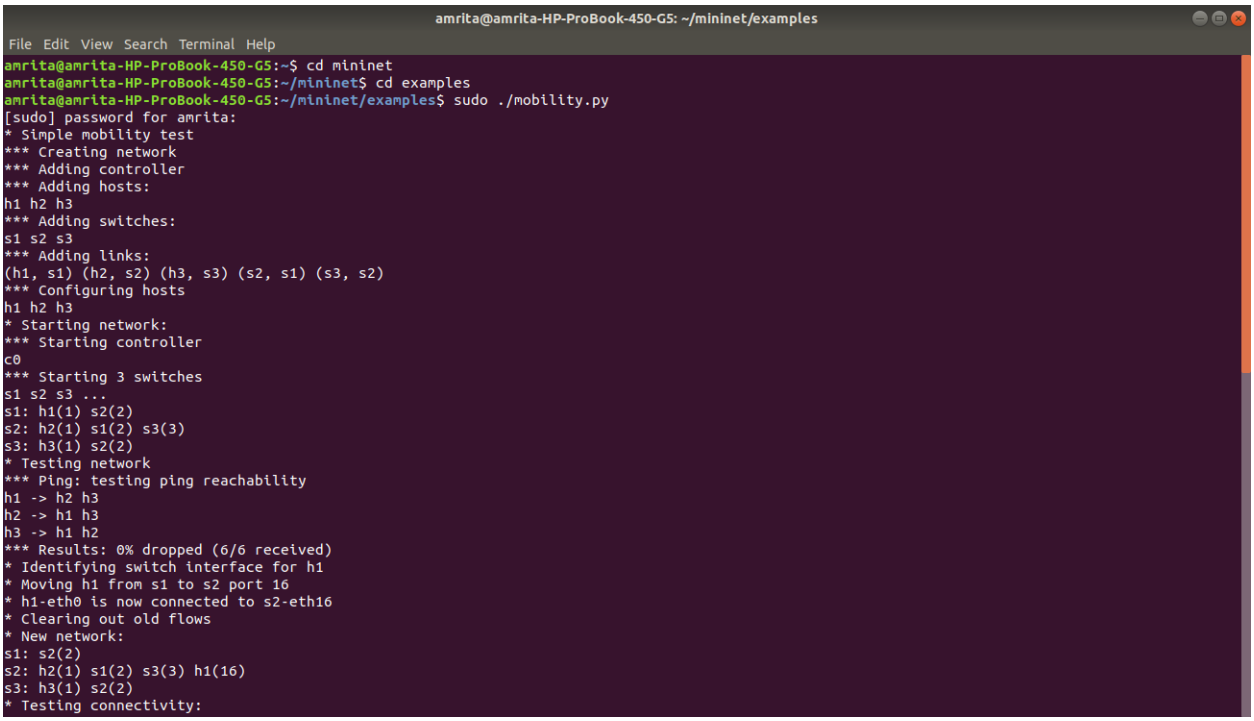
```
        output( '%s: ' % sw )
        for intf in sw.intfList():
            link = intf.link
            if link:
                intf1, intf2 = link.intf1, link.intf2
                remote = intf1 if intf1.node != sw else intf2
                output( '%s(%s) ' % ( remote.node, sw.ports[ intf ] ) )
        output( '\n' )


def moveHost( host, oldSwitch, newSwitch, newPort=None ):
    "Move a host from old switch to new switch"
    hintf, sintf = host.connectionsTo( oldSwitch )[ 0 ]
    oldSwitch.moveIntf( sintf, newSwitch, port=newPort )
    return hintf, sintf


def mobilityTest():
    "A simple test of mobility"
    info( '* Simple mobility test\n' )
    net = Mininet( topo=LinearTopo( 3 ), switch=MobilitySwitch )
    info( '* Starting network:\n' )
    net.start()
    printConnections( net.switches )
    info( '* Testing network\n' )
    net.pingAll()
    info( '* Identifying switch interface for h1\n' )
    h1, old = net.get( 'h1', 's1' )
    for s in 2, 3, 1:
        new = net[ 's%d' % s ]
        port = randint( 10, 20 )
        info( '* Moving', h1, 'from', old, 'to', new, 'port', port, '\n' )
        hintf, sintf = moveHost( h1, old, new, newPort=port )
        info( '*', hintf, 'is now connected to', sintf, '\n' )
        info( '* Clearing out old flows\n' )
        for sw in net.switches:
            sw.dpctl( 'del-flows' )
        info( '* New network:\n' )
        printConnections( net.switches )
        info( '* Testing connectivity:\n' )
        net.pingAll()
        old = new
    net.stop()

if __name__ == '__main__':
    setLogLevel( 'info' )
```

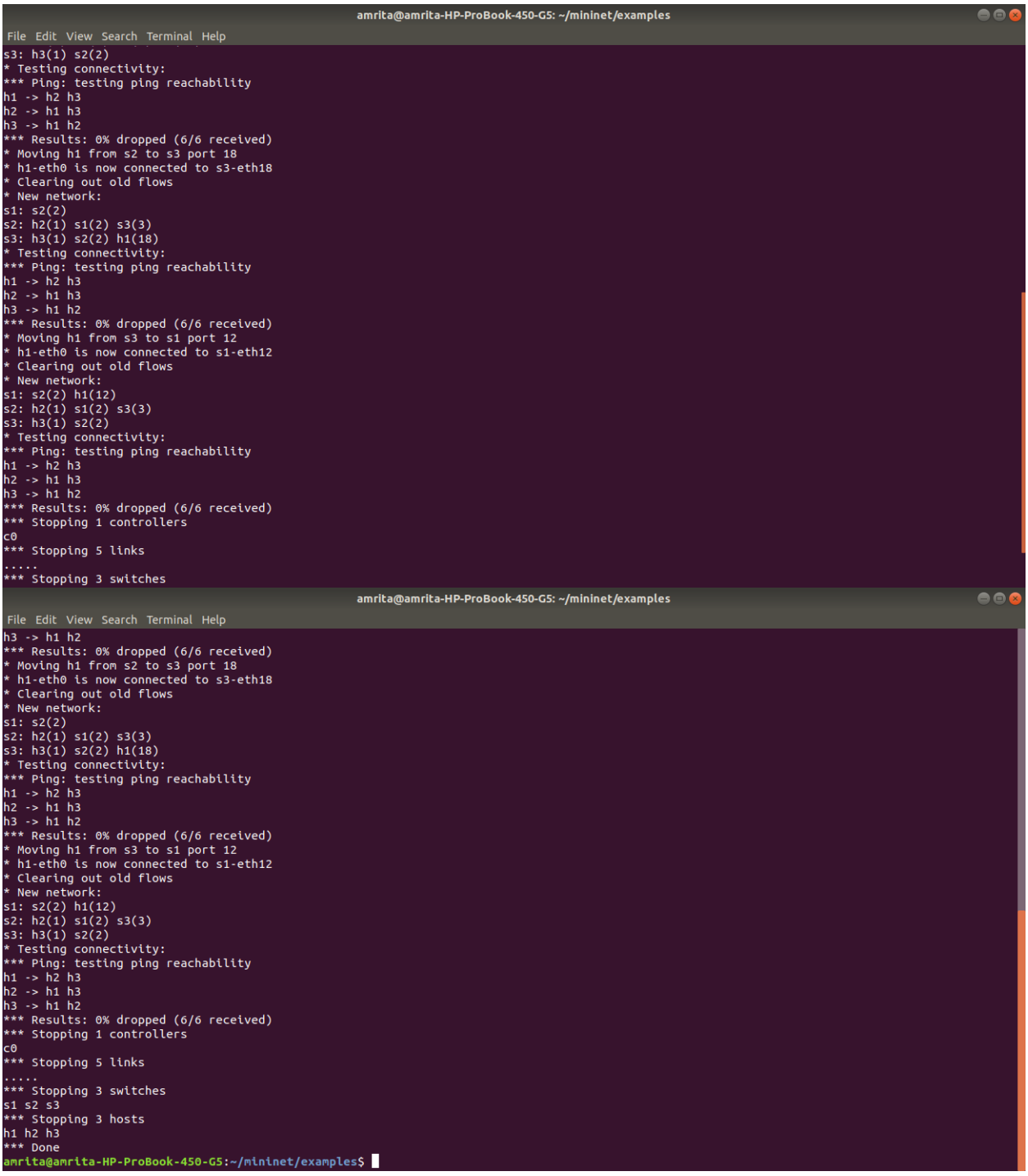
mobilityTest()

These is a .py or python extension code which is in the example folder which is also under the mininet home folder. For this we need to change the directory so that the linux terminal get access of the code

Cd mininet
Cd examples
Sudo ./mobility.py

The given output is




amrita@amrita-HP-ProBook-450-G5: ~/mininet/examples
File Edit View Search Terminal Help
s3: h3(1) s2(2)
* Testing connectivity:
*** Ping: testing ping reachability
h1 -> h2 h3
h2 -> h1 h3
h3 -> h1 h2
*** Results: 0% dropped (6/6 received)
* Moving h1 from s2 to s3 port 18
* h1-eth0 is now connected to s3-eth18
* Clearing out old flows
* New network:
s1: s2(2)
s2: h2(1) s1(2) s3(3)
s3: h3(1) s2(2) h1(18)
* Testing connectivity:
*** Ping: testing ping reachability
h1 -> h2 h3
h2 -> h1 h3
h3 -> h1 h2
*** Results: 0% dropped (6/6 received)
* Moving h1 from s3 to s1 port 12
* h1-eth0 is now connected to s1-eth12
* Clearing out old flows
* New network:
s1: s2(2) h1(12)
s2: h2(1) s1(2) s3(3)
s3: h3(1) s2(2)
* Testing connectivity:
*** Ping: testing ping reachability
h1 -> h2 h3
h2 -> h1 h3
h3 -> h1 h2
*** Results: 0% dropped (6/6 received)
*** Stopping 1 controllers
c0
*** Stopping 5 links
.....
*** Stopping 3 switches
amrita@amrita-HP-ProBook-450-G5: ~/mininet/examples
File Edit View Search Terminal Help
h3 -> h1 h2
*** Results: 0% dropped (6/6 received)
* Moving h1 from s2 to s3 port 18
* h1-eth0 is now connected to s3-eth18
* Clearing out old flows
* New network:
s1: s2(2)
s2: h2(1) s1(2) s3(3)
s3: h3(1) s2(2) h1(18)
* Testing connectivity:
*** Ping: testing ping reachability
h1 -> h2 h3
h2 -> h1 h3
h3 -> h1 h2
*** Results: 0% dropped (6/6 received)
* Moving h1 from s3 to s1 port 12
* h1-eth0 is now connected to s1-eth12
* Clearing out old flows
* New network:
s1: s2(2) h1(12)
s2: h2(1) s1(2) s3(3)
s3: h3(1) s2(2)
* Testing connectivity:
*** Ping: testing ping reachability
h1 -> h2 h3
h2 -> h1 h3
h3 -> h1 h2
*** Results: 0% dropped (6/6 received)
*** Stopping 1 controllers
c0
*** Stopping 5 links
.....
*** Stopping 3 switches
s1 s2 s3
*** Stopping 3 hosts
h1 h2 h3
*** Done
amrita@amrita-HP-ProBook-450-G5:~/mininet/examples$

Discussion: In this lab, we learnt how to install the mininet and how does it work specially. The hosts were moving from each switches to another then come back to the first one which shows the absolute mobility test of networks running on mininet based on software.