Assignment 2 – Mininet Topology Analysis

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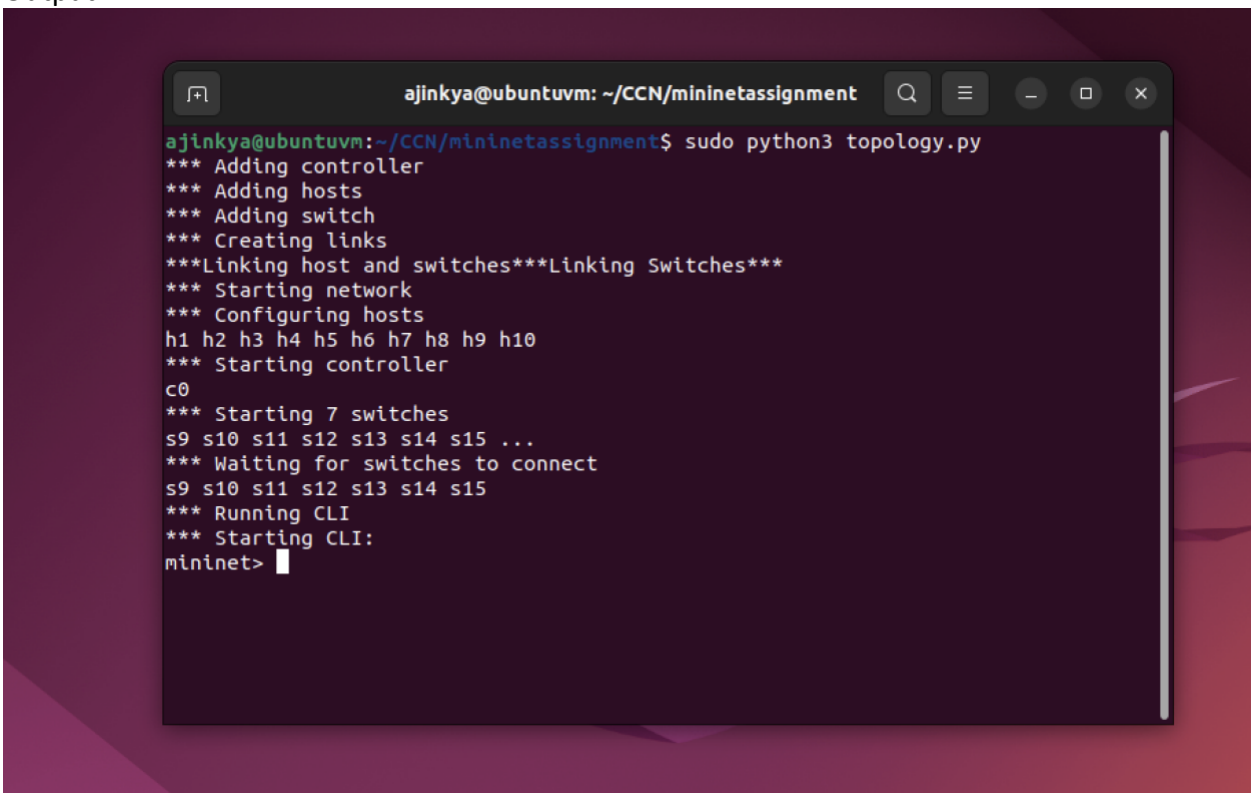
1. Script file **topology.py** the file can be found in the submitted zip file
2. Output



Python Code:

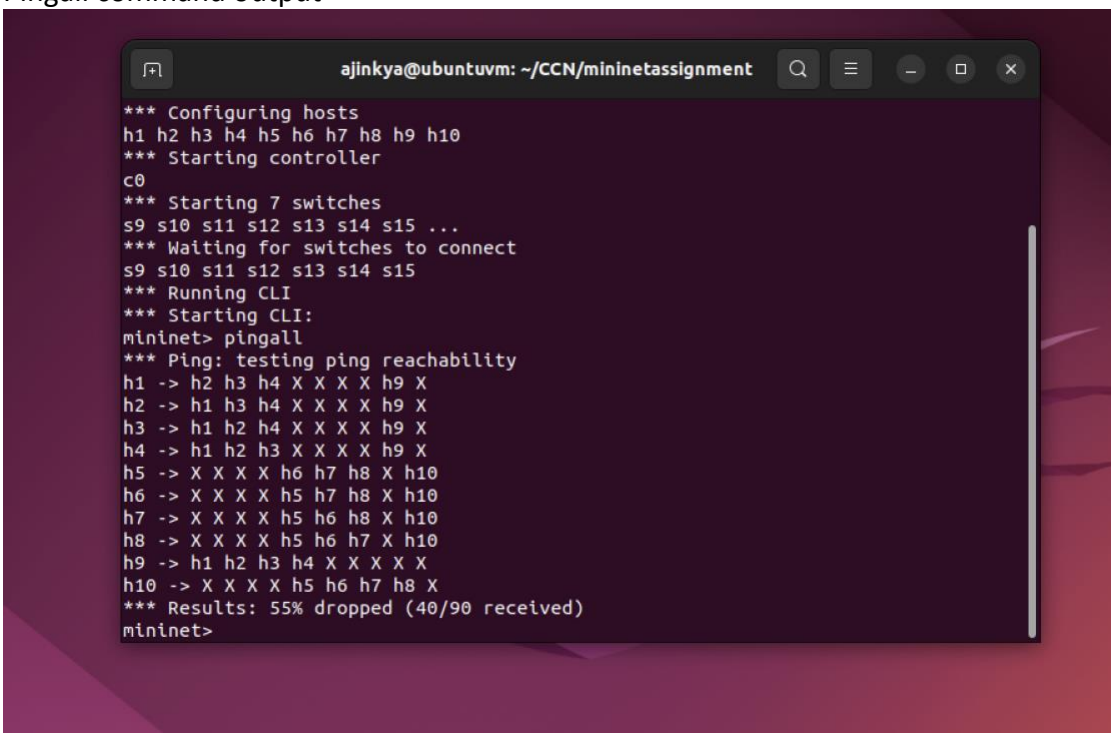
Open

topology.py
~/CCN/mininetassignment

```
from mininet.net import Mininet
from mininet.node import Controller
from mininet.cli import CLI
from mininet.log import setLogLevel,info

def network():
    net = Mininet(topo=None,controller = Controller, waitConnected = True)

    info( '*** Adding controller\n' )
    net.addController('c0')

    info( '*** Adding hosts\n' )
    h1 = net.addHost('h1', ip='10.0.1.10/24')
    h2 = net.addHost('h2', ip='10.0.1.11/24')
    h3 = net.addHost('h3', ip='10.0.1.12/24')
    h4 = net.addHost('h4', ip='10.0.1.13/24')
    h5 = net.addHost('h5', ip='10.0.2.10/24')
    h6 = net.addHost('h6', ip='10.0.2.11/24')
    h7 = net.addHost('h7', ip='10.0.2.12/24')
    h8 = net.addHost('h8', ip='10.0.2.13/24')
    h9 = net.addHost('h9', ip='10.0.1.1/24')
    h10 = net.addHost('h10', ip='10.0.2.1/24')

    info( '*** Adding switch\n' )
    s9 = net.addSwitch('s9')
    s10 = net.addSwitch('s10')
    s11 = net.addSwitch('s11')
    s12 = net.addSwitch('s12')
    s13 = net.addSwitch('s13')
    s14 = net.addSwitch('s14')
    s15 = net.addSwitch('s15')

    info( '*** Creating links\n' )
    info('***Linking host and switches')
    net.addLink( h1, s11 )
    net.addLink( h2, s11 )

    net.addLink( h3, s12 )
    net.addLink( h4, s12 )

```

```
    net.addLink( h5, s14 )
    net.addLink( h6, s14 )

    net.addLink( h7, s15 )
    net.addLink( h8, s15 )

    net.addLink( h9, s9 )
    net.addLink( h10, s9 )

    info('***Linking Switches***\n')
    net.addLink(s10,s11)
    net.addLink(s10,s12)

    net.addLink(s13,s14)
    net.addLink(s13,s15)

    net.addLink(s9,s10)
    net.addLink(s9,s13)

    info( '*** Starting network\n')
    net.start()

    info( '*** Running CLI\n' )
    CLI( net )

    info( '*** Stopping network' )
    net.stop()

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

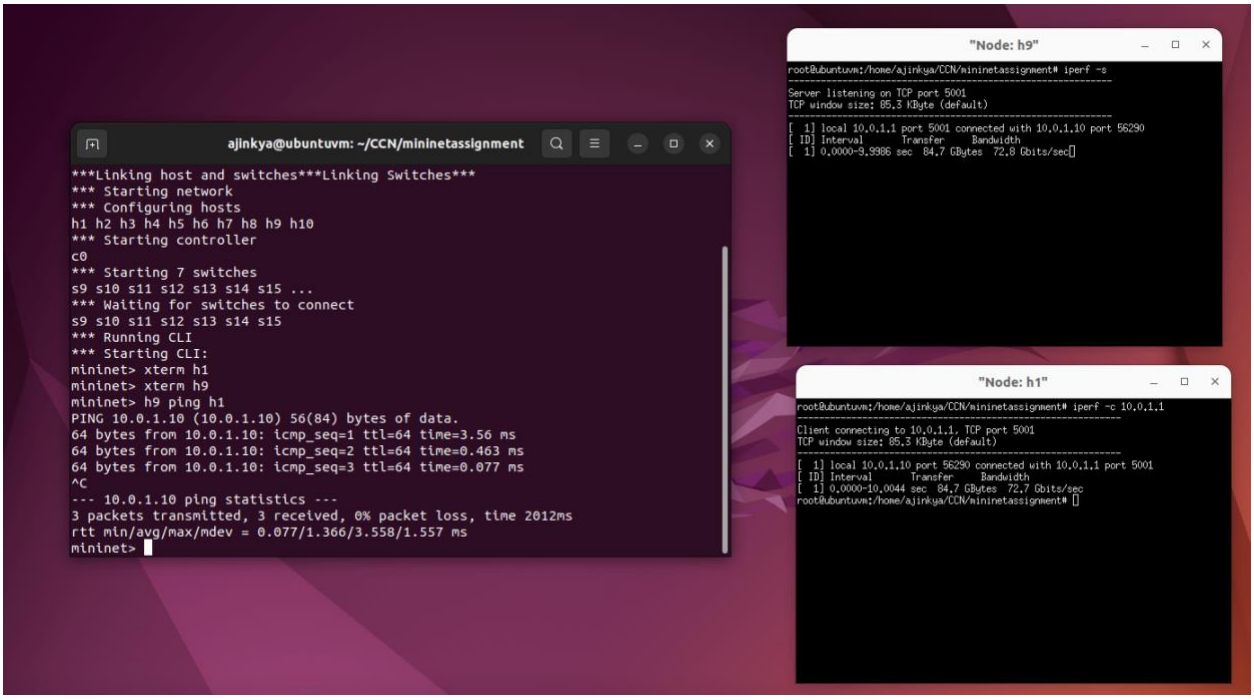
3. Pingall command output



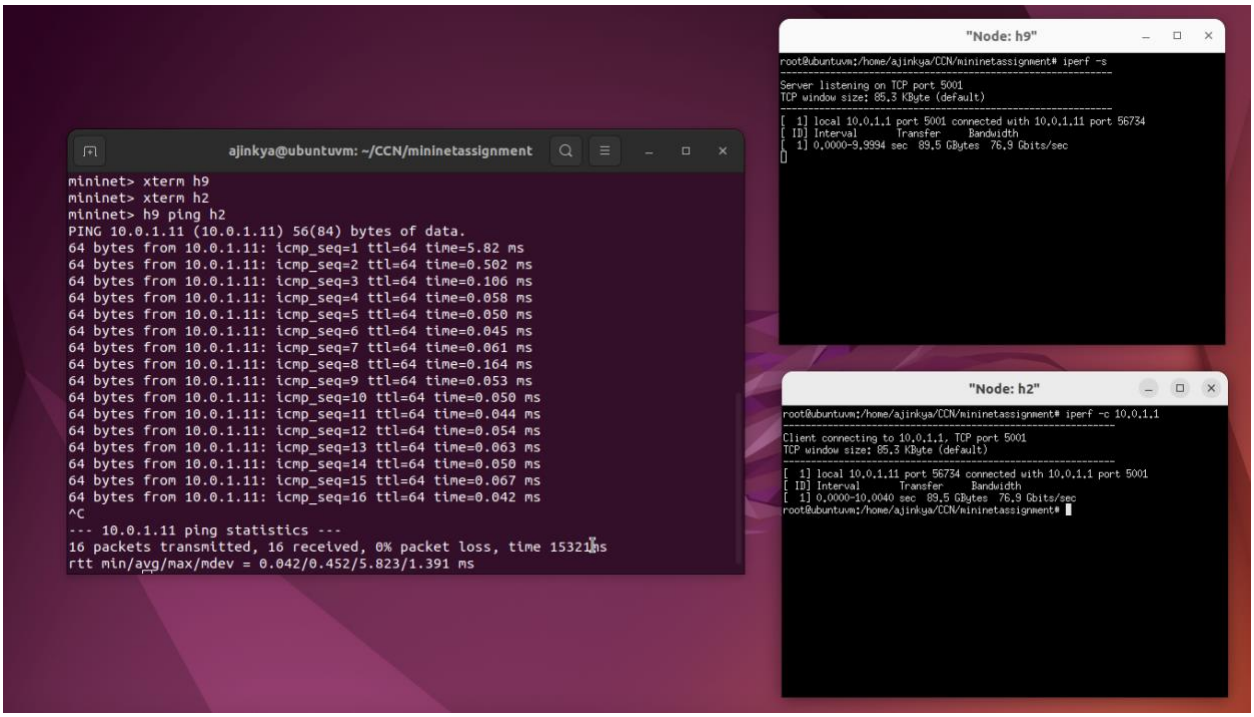
4. Table for scenario 1 and 2

Scenario 1:

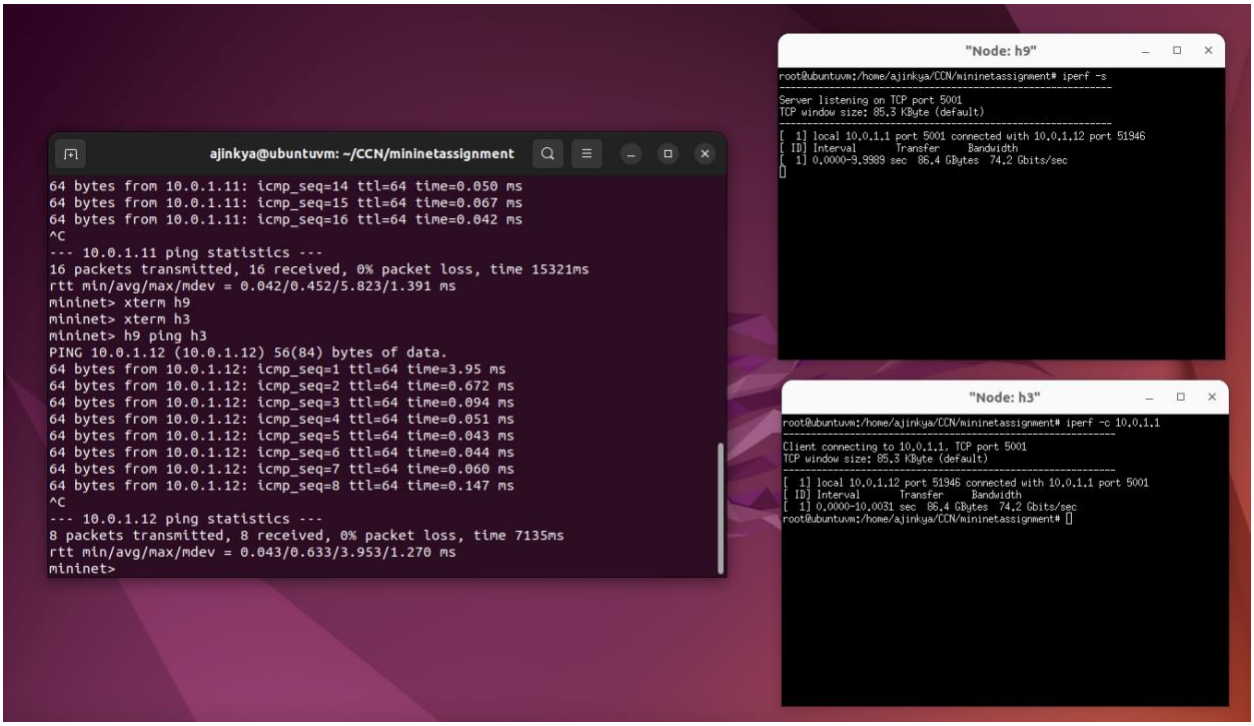
H9 -> H1:



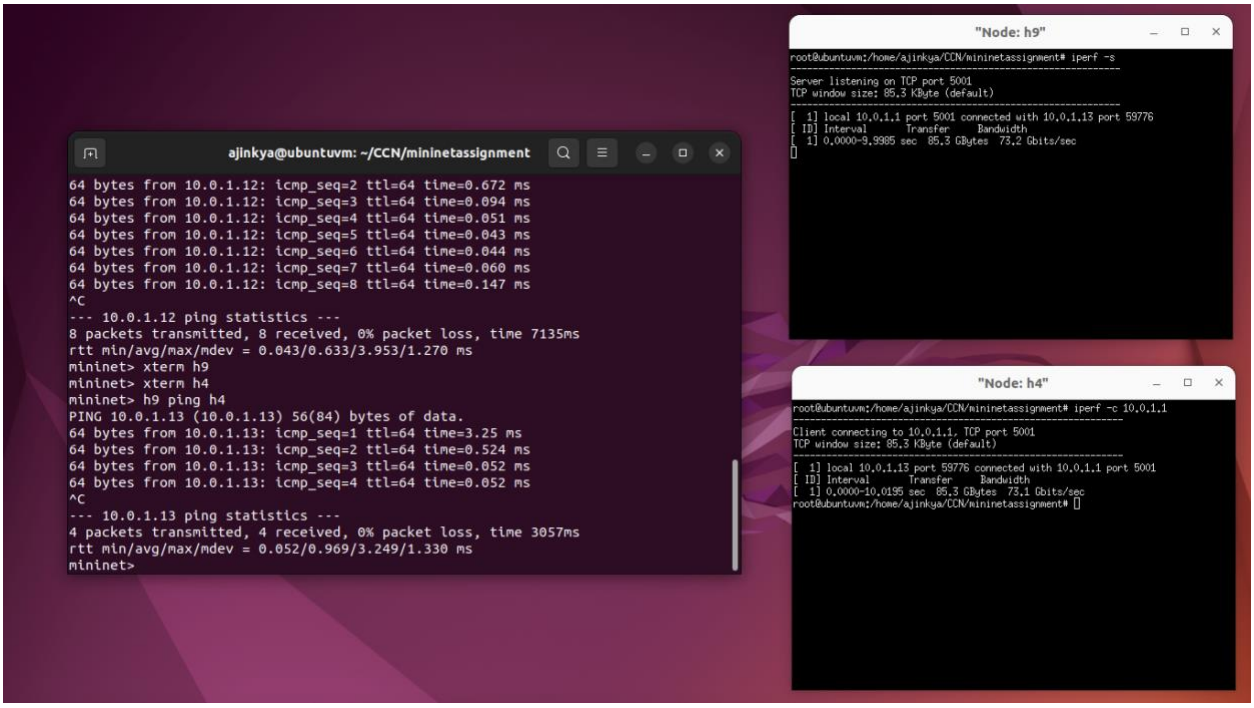
H9 -> H2



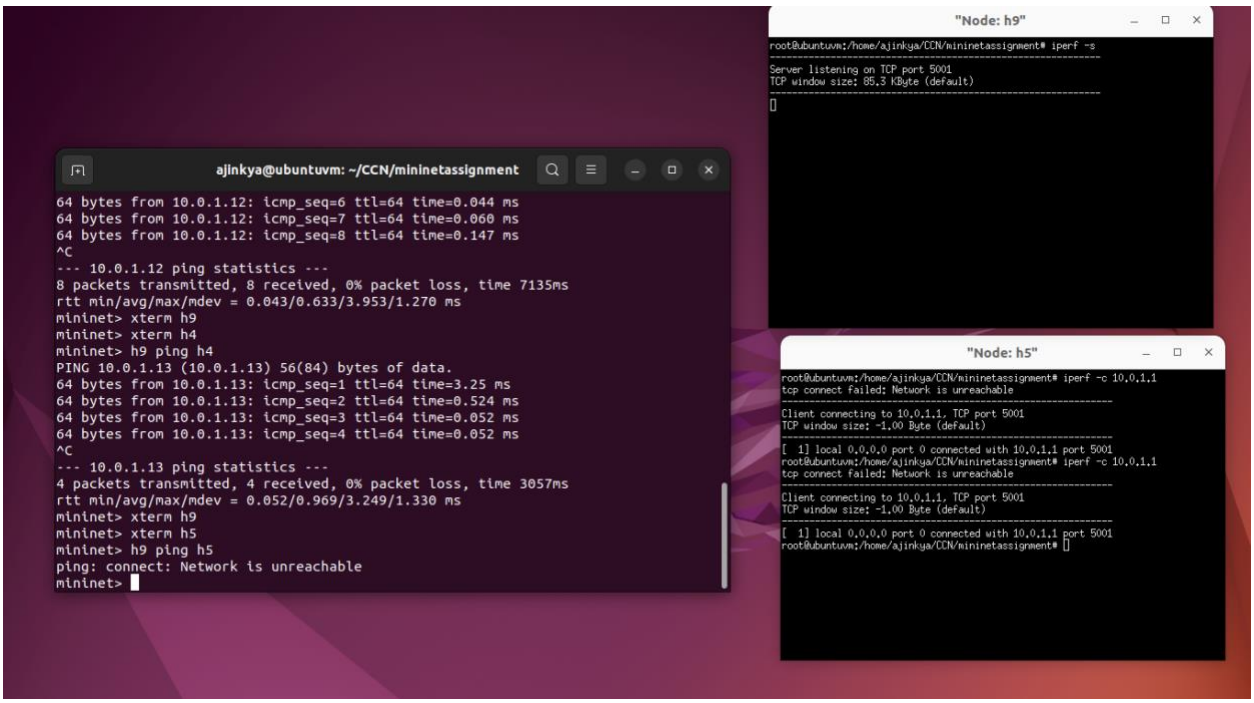
H9 -> H3


ajinkya@ubuntuvm: ~/CCN/mininetassignment
64 bytes from 10.0.1.11: icmp_seq=14 ttl=64 time=0.050 ms
64 bytes from 10.0.1.11: icmp_seq=15 ttl=64 time=0.067 ms
64 bytes from 10.0.1.11: icmp_seq=16 ttl=64 time=0.042 ms
^C
--- 10.0.1.11 ping statistics ---
16 packets transmitted, 16 received, 0% packet loss, time 15321ms
rtt min/avg/max/mdev = 0.042/0.452/5.823/1.391 ms
mininet> xterm h9
mininet> xterm h3
mininet> h9 ping h3
PING 10.0.1.12 (10.0.1.12) 56(84) bytes of data.
64 bytes from 10.0.1.12: icmp_seq=1 ttl=64 time=3.95 ms
64 bytes from 10.0.1.12: icmp_seq=2 ttl=64 time=0.672 ms
64 bytes from 10.0.1.12: icmp_seq=3 ttl=64 time=0.094 ms
64 bytes from 10.0.1.12: icmp_seq=4 ttl=64 time=0.051 ms
64 bytes from 10.0.1.12: icmp_seq=5 ttl=64 time=0.043 ms
64 bytes from 10.0.1.12: icmp_seq=6 ttl=64 time=0.044 ms
64 bytes from 10.0.1.12: icmp_seq=7 ttl=64 time=0.060 ms
64 bytes from 10.0.1.12: icmp_seq=8 ttl=64 time=0.147 ms
^C
--- 10.0.1.12 ping statistics ---
8 packets transmitted, 8 received, 0% packet loss, time 7135ms
rtt min/avg/max/mdev = 0.043/0.633/3.953/1.270 ms
mininet>
"Node: h9"
root@ubuntuvm:/home/ajinkya/CCN/mininetassignment# iperf -s
Server listening on TCP port 5001
TCP window size: 85.3 KByte (default)
[1] local 10.0.1.1 port 5001 connected with 10.0.1.12 port 51946
[ID] Interval Transfer Bandwidth
[1] 0.0000-9.9989 sec 86.4 GBytes 74.2 Gbits/sec
"Node: h3"
root@ubuntuvm:/home/ajinkya/CCN/mininetassignment# iperf -c 10.0.1.1
Client connecting to 10.0.1.1, TCP port 5001
TCP window size: 85.3 KByte (default)
[1] local 10.0.1.12 port 51946 connected with 10.0.1.1 port 5001
[ID] Interval Transfer Bandwidth
[1] 0.0000-10.0031 sec 86.4 GBytes 74.2 Gbits/sec
root@ubuntuvm:/home/ajinkya/CCN/mininetassignment#

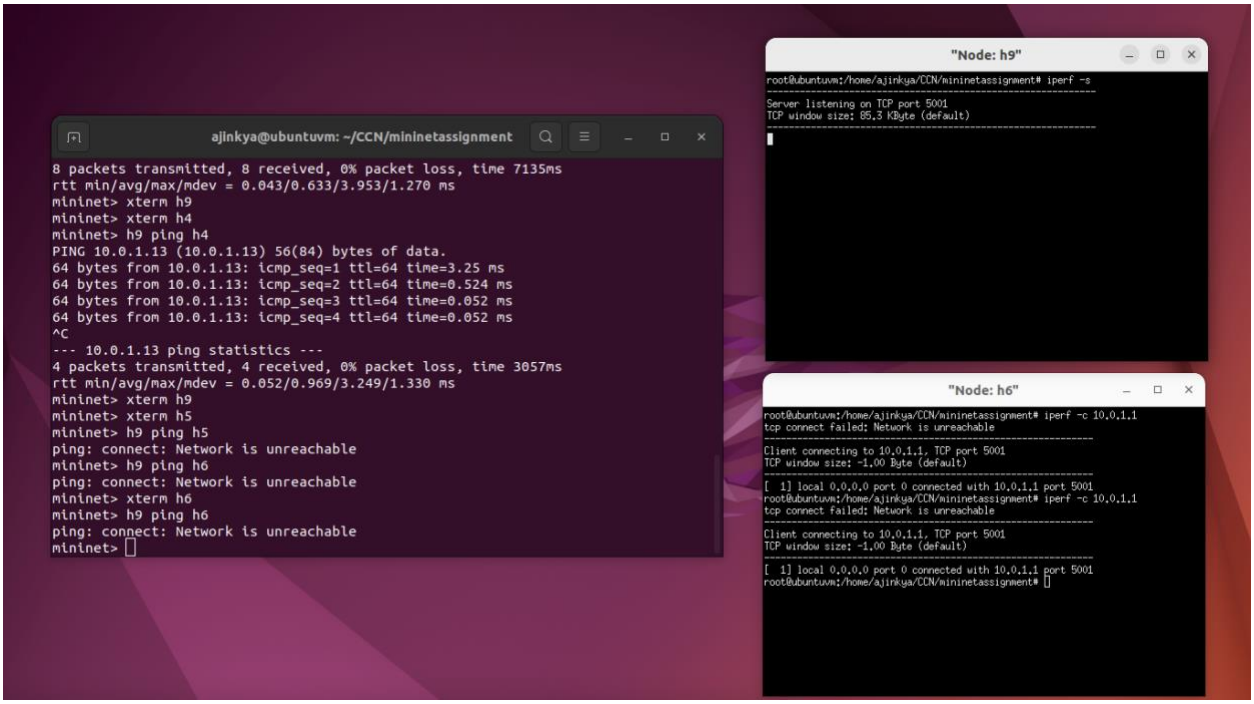
H9 -> H4


ajinkya@ubuntuvm: ~/CCN/mininetassignment
64 bytes from 10.0.1.12: icmp_seq=2 ttl=64 time=0.672 ms
64 bytes from 10.0.1.12: icmp_seq=3 ttl=64 time=0.094 ms
64 bytes from 10.0.1.12: icmp_seq=4 ttl=64 time=0.051 ms
64 bytes from 10.0.1.12: icmp_seq=5 ttl=64 time=0.043 ms
64 bytes from 10.0.1.12: icmp_seq=6 ttl=64 time=0.044 ms
64 bytes from 10.0.1.12: icmp_seq=7 ttl=64 time=0.060 ms
64 bytes from 10.0.1.12: icmp_seq=8 ttl=64 time=0.147 ms
^C
--- 10.0.1.12 ping statistics ---
8 packets transmitted, 8 received, 0% packet loss, time 7135ms
rtt min/avg/max/mdev = 0.043/0.633/3.953/1.270 ms
mininet> xterm h9
mininet> xterm h4
mininet> h9 ping h4
PING 10.0.1.13 (10.0.1.13) 56(84) bytes of data.
64 bytes from 10.0.1.13: icmp_seq=1 ttl=64 time=3.25 ms
64 bytes from 10.0.1.13: icmp_seq=2 ttl=64 time=0.524 ms
64 bytes from 10.0.1.13: icmp_seq=3 ttl=64 time=0.052 ms
64 bytes from 10.0.1.13: icmp_seq=4 ttl=64 time=0.052 ms
^C
--- 10.0.1.13 ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 3057ms
rtt min/avg/max/mdev = 0.052/0.969/3.249/1.330 ms
mininet>
"Node: h9"
root@ubuntuvm:/home/ajinkya/CCN/mininetassignment# iperf -s
Server listening on TCP port 5001
TCP window size: 85.3 KByte (default)
[1] local 10.0.1.1 port 5001 connected with 10.0.1.13 port 59776
[ID] Interval Transfer Bandwidth
[1] 0.0000-9.9985 sec 85.3 GBytes 73.2 Gbits/sec
"Node: h4"
root@ubuntuvm:/home/ajinkya/CCN/mininetassignment# iperf -c 10.0.1.1
Client connecting to 10.0.1.1, TCP port 5001
TCP window size: 85.3 KByte (default)
[1] local 10.0.1.13 port 59776 connected with 10.0.1.1 port 5001
[ID] Interval Transfer Bandwidth
[1] 0.0000-10.0195 sec 85.3 GBytes 73.1 Gbits/sec
root@ubuntuvm:/home/ajinkya/CCN/mininetassignment#

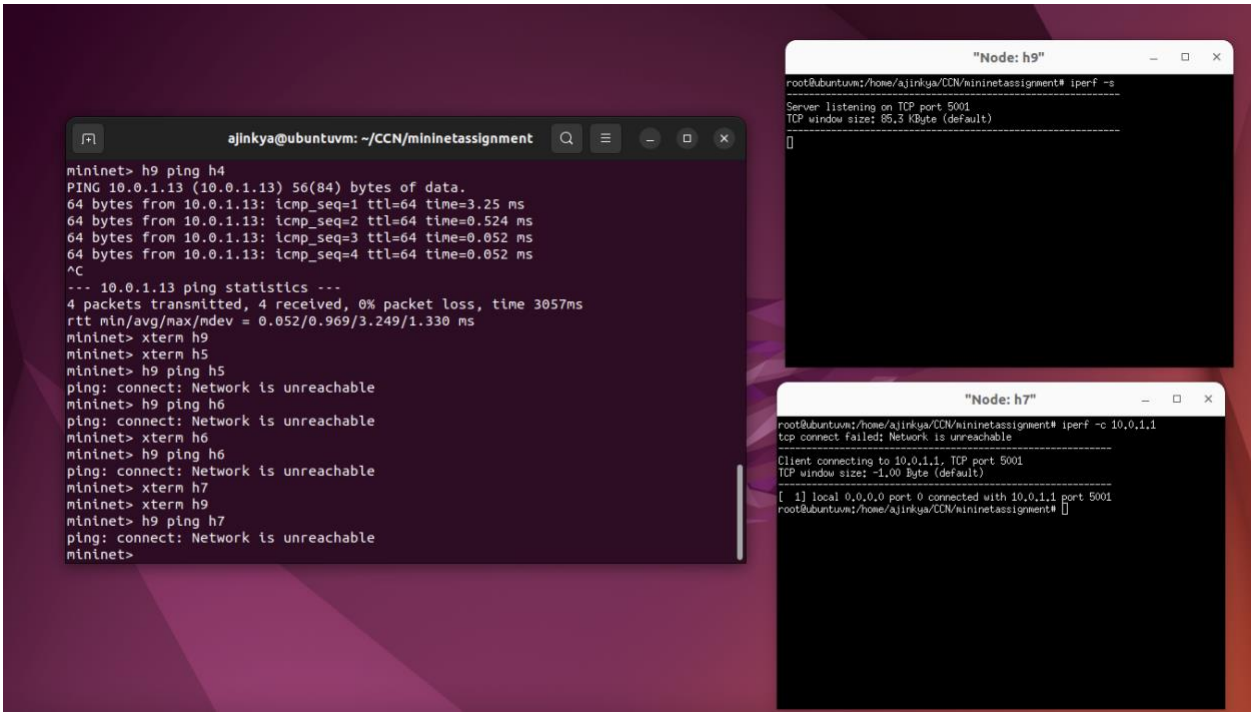
H9 -> H5


ajinkya@ubuntuvm: ~/CCN/mininetassignment
64 bytes from 10.0.1.12: icmp_seq=6 ttl=64 time=0.044 ms
64 bytes from 10.0.1.12: icmp_seq=7 ttl=64 time=0.060 ms
64 bytes from 10.0.1.12: icmp_seq=8 ttl=64 time=0.147 ms
^C
--- 10.0.1.12 ping statistics ---
8 packets transmitted, 8 received, 0% packet loss, time 7135ms
rtt min/avg/max/mdev = 0.043/0.633/3.953/1.270 ms
mininet> xterm h9
mininet> xterm h4
mininet> h9 ping h4
PING 10.0.1.13 (10.0.1.13) 56(84) bytes of data.
64 bytes from 10.0.1.13: icmp_seq=1 ttl=64 time=3.25 ms
64 bytes from 10.0.1.13: icmp_seq=2 ttl=64 time=0.524 ms
64 bytes from 10.0.1.13: icmp_seq=3 ttl=64 time=0.052 ms
64 bytes from 10.0.1.13: icmp_seq=4 ttl=64 time=0.052 ms
^C
--- 10.0.1.13 ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 3057ms
rtt min/avg/max/mdev = 0.052/0.969/3.249/1.330 ms
mininet> xterm h9
mininet> xterm h5
mininet> h9 ping h5
ping: connect: Network is unreachable
mininet>
"Node: h9"
root@ubuntuvm:/home/ajinkya/CCN/mininetassignment# iperf -s
Server listening on TCP port 5001
TCP window size: 85.3 KByte (default)
"Node: h5"
root@ubuntuvm:/home/ajinkya/CCN/mininetassignment# iperf -c 10.0.1.1
tcp connect failed: Network is unreachable
Client connecting to 10.0.1.1, TCP port 5001
TCP window size: -1.00 Byte (default)
[1] local 0.0.0.0 port 0 connected with 10.0.1.1 port 5001
root@ubuntuvm:/home/ajinkya/CCN/mininetassignment# iperf -c 10.0.1.1
tcp connect failed: Network is unreachable
Client connecting to 10.0.1.1, TCP port 5001
TCP window size: -1.00 Byte (default)
[1] local 0.0.0.0 port 0 connected with 10.0.1.1 port 5001
root@ubuntuvm:/home/ajinkya/CCN/mininetassignment#

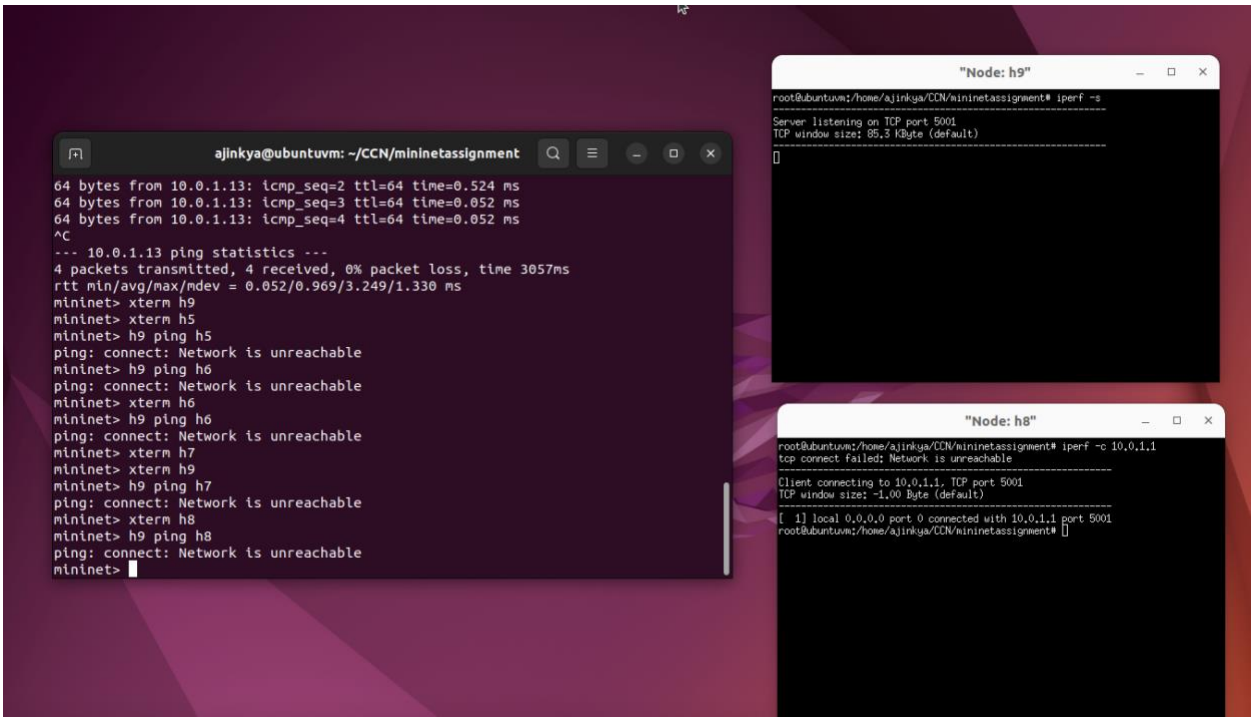
H9 -> H6


ajinkya@ubuntuvm: ~/CCN/mininetassignment
8 packets transmitted, 8 received, 0% packet loss, time 7135ms
rtt min/avg/max/mdev = 0.043/0.633/3.953/1.270 ms
mininet> xterm h9
mininet> xterm h4
mininet> h9 ping h4
PING 10.0.1.13 (10.0.1.13) 56(84) bytes of data.
64 bytes from 10.0.1.13: icmp_seq=1 ttl=64 time=3.25 ms
64 bytes from 10.0.1.13: icmp_seq=2 ttl=64 time=0.524 ms
64 bytes from 10.0.1.13: icmp_seq=3 ttl=64 time=0.052 ms
64 bytes from 10.0.1.13: icmp_seq=4 ttl=64 time=0.052 ms
^C
--- 10.0.1.13 ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 3057ms
rtt min/avg/max/mdev = 0.052/0.969/3.249/1.330 ms
mininet> xterm h9
mininet> xterm h5
mininet> h9 ping h5
ping: connect: Network is unreachable
mininet> h9 ping h6
ping: connect: Network is unreachable
mininet> xterm h6
mininet> h9 ping h6
ping: connect: Network is unreachable
mininet>
"Node: h9"
root@ubuntuvm:/home/ajinkya/CCN/mininetassignment# iperf -s
Server listening on TCP port 5001
TCP window size: 85.3 KByte (default)
"Node: h6"
root@ubuntuvm:/home/ajinkya/CCN/mininetassignment# iperf -c 10.0.1.1
tcp connect failed: Network is unreachable
Client connecting to 10.0.1.1, TCP port 5001
TCP window size: -1.00 Byte (default)
[1] local 0.0.0.0 port 0 connected with 10.0.1.1 port 5001
root@ubuntuvm:/home/ajinkya/CCN/mininetassignment# iperf -c 10.0.1.1
tcp connect failed: Network is unreachable
Client connecting to 10.0.1.1, TCP port 5001
TCP window size: -1.00 Byte (default)
[1] local 0.0.0.0 port 0 connected with 10.0.1.1 port 5001
root@ubuntuvm:/home/ajinkya/CCN/mininetassignment#

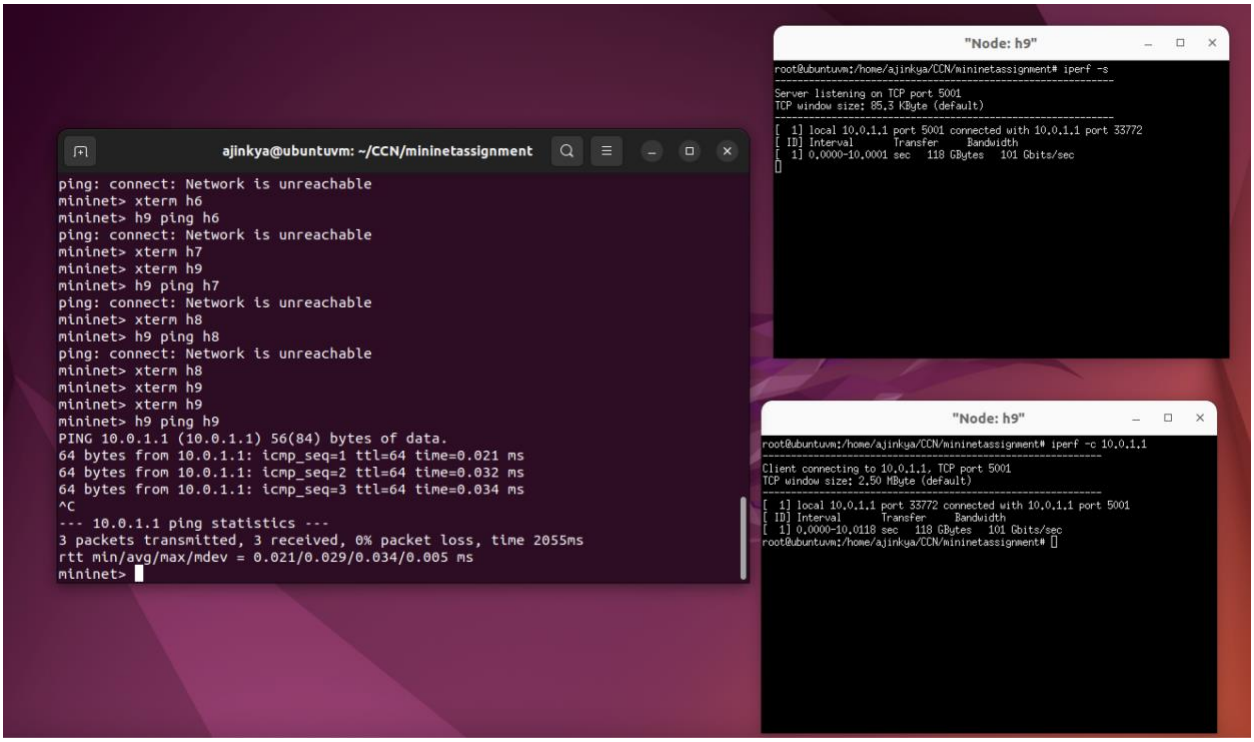
H9 -> H7


"Node: h9"
root@ubuntuvm:/home/ajinkya/CCN/mininetassignment# iperf -s
Server listening on TCP port 5001
TCP window size: 85.3 KByte (default)
"Node: h7"
root@ubuntuvm:/home/ajinkya/CCN/mininetassignment# iperf -c 10.0.1.1
tcp connect failed: Network is unreachable
Client connecting to 10.0.1.1, TCP port 5001
TCP window size: -1.00 Byte (default)
[1] local 0.0.0.0 port 0 connected with 10.0.1.1 port 5001
root@ubuntuvm:/home/ajinkya/CCN/mininetassignment#
ajinkya@ubuntuvm: ~/CCN/mininetassignment
mininet> h9 ping h4
PING 10.0.1.13 (10.0.1.13) 56(84) bytes of data.
64 bytes from 10.0.1.13: icmp_seq=1 ttl=64 time=3.25 ms
64 bytes from 10.0.1.13: icmp_seq=2 ttl=64 time=0.524 ms
64 bytes from 10.0.1.13: icmp_seq=3 ttl=64 time=0.052 ms
64 bytes from 10.0.1.13: icmp_seq=4 ttl=64 time=0.052 ms
^C
--- 10.0.1.13 ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 3057ms
rtt min/avg/max/mdev = 0.052/0.969/3.249/1.330 ms
mininet> xterm h9
mininet> xterm h5
mininet> h9 ping h5
ping: connect: Network is unreachable
mininet> h9 ping h6
ping: connect: Network is unreachable
mininet> xterm h6
mininet> h9 ping h6
ping: connect: Network is unreachable
mininet> xterm h7
mininet> xterm h9
mininet> h9 ping h7
ping: connect: Network is unreachable
mininet>

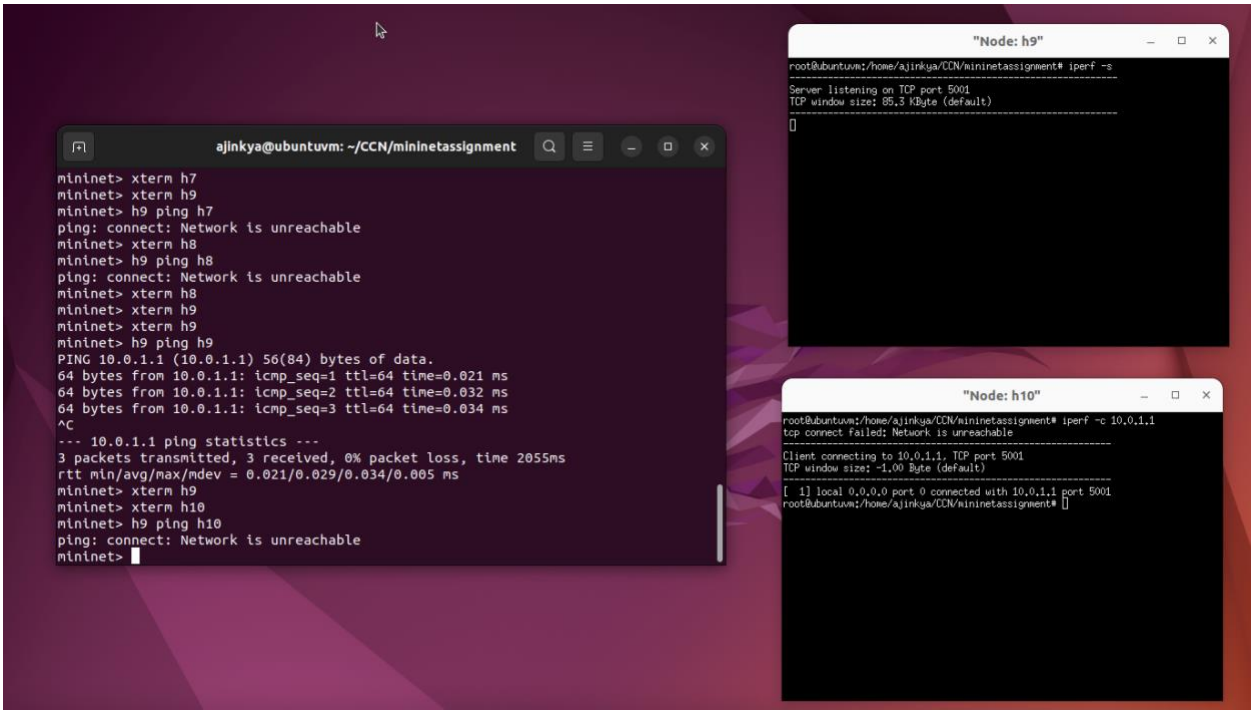
H9 -> H8


"Node: h9"
root@ubuntuvm:/home/ajinkya/CCN/mininetassignment# iperf -s
Server listening on TCP port 5001
TCP window size: 85.3 KByte (default)
"Node: h8"
root@ubuntuvm:/home/ajinkya/CCN/mininetassignment# iperf -c 10.0.1.1
tcp connect failed: Network is unreachable
Client connecting to 10.0.1.1, TCP port 5001
TCP window size: -1.00 Byte (default)
[1] local 0.0.0.0 port 0 connected with 10.0.1.1 port 5001
root@ubuntuvm:/home/ajinkya/CCN/mininetassignment#
ajinkya@ubuntuvm: ~/CCN/mininetassignment
64 bytes from 10.0.1.13: icmp_seq=2 ttl=64 time=0.524 ms
64 bytes from 10.0.1.13: icmp_seq=3 ttl=64 time=0.052 ms
64 bytes from 10.0.1.13: icmp_seq=4 ttl=64 time=0.052 ms
^C
--- 10.0.1.13 ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 3057ms
rtt min/avg/max/mdev = 0.052/0.969/3.249/1.330 ms
mininet> xterm h9
mininet> xterm h5
mininet> h9 ping h5
ping: connect: Network is unreachable
mininet> h9 ping h6
ping: connect: Network is unreachable
mininet> xterm h6
mininet> h9 ping h6
ping: connect: Network is unreachable
mininet> xterm h7
mininet> xterm h9
mininet> h9 ping h7
ping: connect: Network is unreachable
mininet> xterm h8
mininet> h9 ping h8
ping: connect: Network is unreachable
mininet>

H9 -> H9:

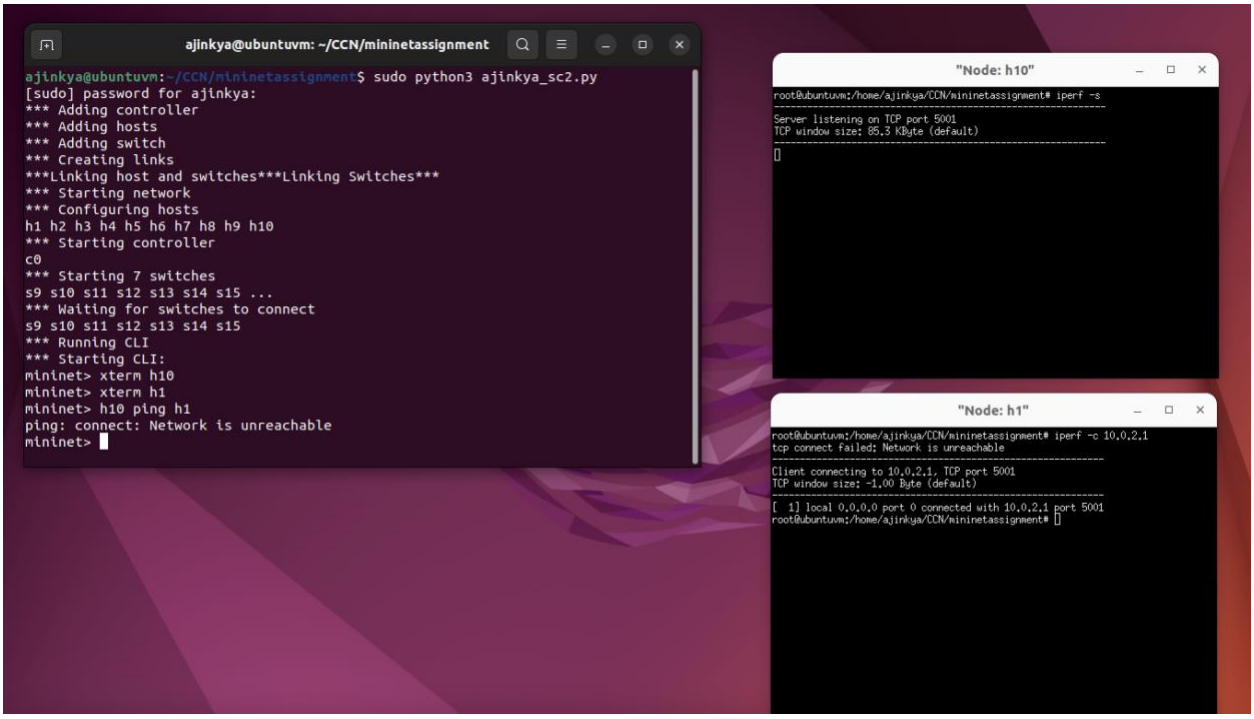

ajinkya@ubuntuvm: ~/CCN/mininetassignment
ping: connect: Network is unreachable
mininet> xterm h6
mininet> h9 ping h6
ping: connect: Network is unreachable
mininet> xterm h7
mininet> xterm h9
mininet> h9 ping h7
ping: connect: Network is unreachable
mininet> xterm h8
mininet> h9 ping h8
ping: connect: Network is unreachable
mininet> xterm h8
mininet> xterm h9
mininet> xterm h9
mininet> h9 ping h9
PING 10.0.1.1 (10.0.1.1) 56(84) bytes of data.
64 bytes from 10.0.1.1: icmp_seq=1 ttl=64 time=0.021 ms
64 bytes from 10.0.1.1: icmp_seq=2 ttl=64 time=0.032 ms
64 bytes from 10.0.1.1: icmp_seq=3 ttl=64 time=0.034 ms
^C
--- 10.0.1.1 ping statistics ---
3 packets transmitted, 3 received, 0% packet loss, time 2055ms
rtt min/avg/max/mdev = 0.021/0.029/0.034/0.005 ms
mininet>
"Node: h9"
root@ubuntuvm:/home/ajinkya/CCN/mininetassignment# iperf -s
Server listening on TCP port 5001
TCP window size: 85.3 KByte (default)
[1] local 10.0.1.1 port 5001 connected with 10.0.1.1 port 33772
[ID] Interval Transfer Bandwidth
[1] 0.0000-10.0001 sec 118 GBytes 101 Gbits/sec
"Node: h9"
root@ubuntuvm:/home/ajinkya/CCN/mininetassignment# iperf -c 10.0.1.1
Client connecting to 10.0.1.1, TCP port 5001
TCP window size: 2.50 MByte (default)
[1] local 10.0.1.1 port 33772 connected with 10.0.1.1 port 5001
[ID] Interval Transfer Bandwidth
[1] 0.0000-10.0118 sec 118 GBytes 101 Gbits/sec
root@ubuntuvm:/home/ajinkya/CCN/mininetassignment#

H9 -> H10:

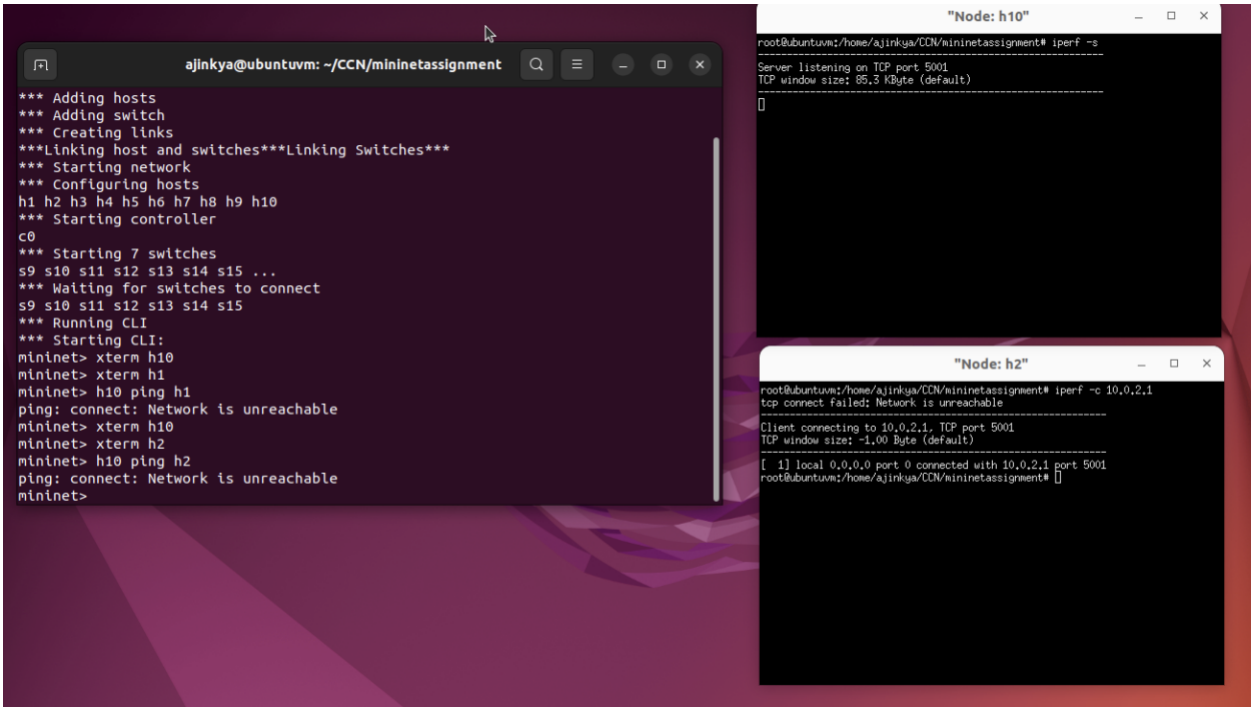

ajinkya@ubuntuvm: ~/CCN/mininetassignment
mininet> xterm h7
mininet> xterm h9
mininet> h9 ping h7
ping: connect: Network is unreachable
mininet> xterm h8
mininet> h9 ping h8
ping: connect: Network is unreachable
mininet> xterm h8
mininet> xterm h9
mininet> xterm h9
mininet> h9 ping h9
PING 10.0.1.1 (10.0.1.1) 56(84) bytes of data.
64 bytes from 10.0.1.1: icmp_seq=1 ttl=64 time=0.021 ms
64 bytes from 10.0.1.1: icmp_seq=2 ttl=64 time=0.032 ms
64 bytes from 10.0.1.1: icmp_seq=3 ttl=64 time=0.034 ms
^C
--- 10.0.1.1 ping statistics ---
3 packets transmitted, 3 received, 0% packet loss, time 2055ms
rtt min/avg/max/mdev = 0.021/0.029/0.034/0.005 ms
mininet> xterm h9
mininet> xterm h10
mininet> h9 ping h10
ping: connect: Network is unreachable
mininet>
"Node: h9"
root@ubuntuvm:/home/ajinkya/CCN/mininetassignment# iperf -s
Server listening on TCP port 5001
TCP window size: 85.3 KByte (default)
"Node: h10"
root@ubuntuvm:/home/ajinkya/CCN/mininetassignment# iperf -c 10.0.1.1
tcp connect failed: Network is unreachable
Client connecting to 10.0.1.1, TCP port 5001
TCP window size: -1.00 Byte (default)
[1] local 0.0.0.0 port 0 connected with 10.0.1.1 port 5001
root@ubuntuvm:/home/ajinkya/CCN/mininetassignment#

Scenario 2:

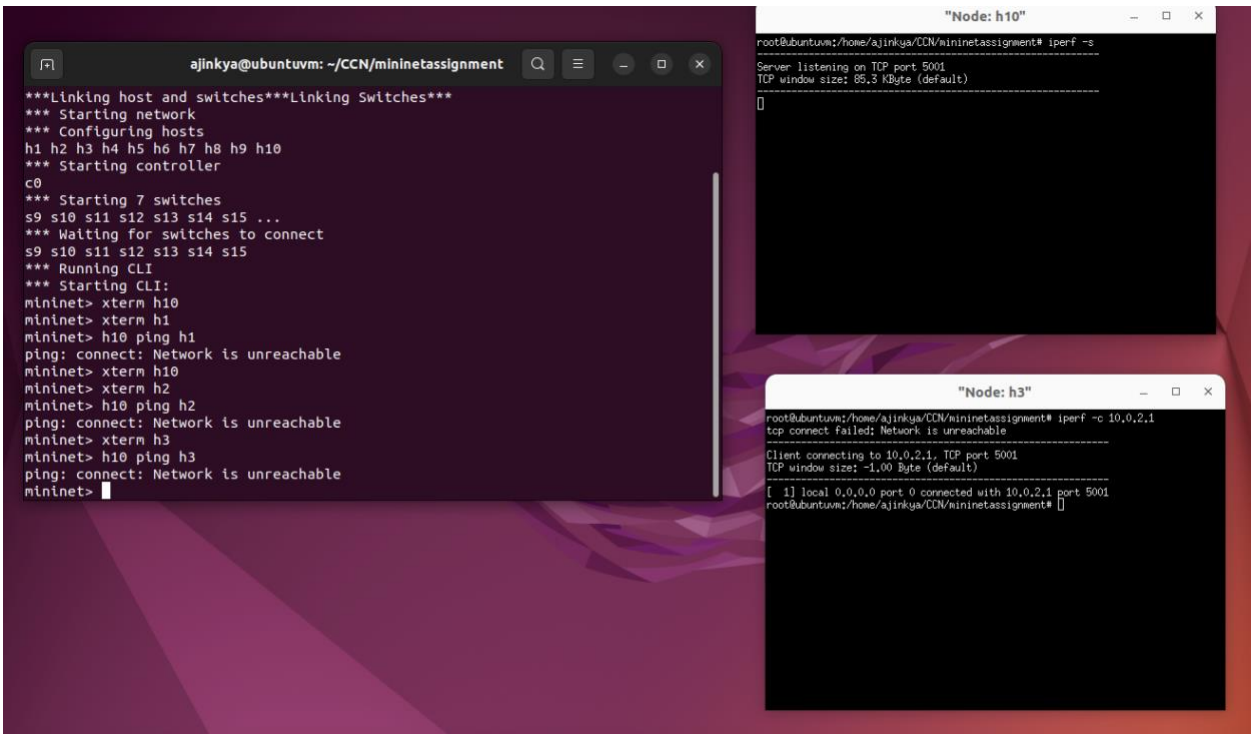
H10 -> H1



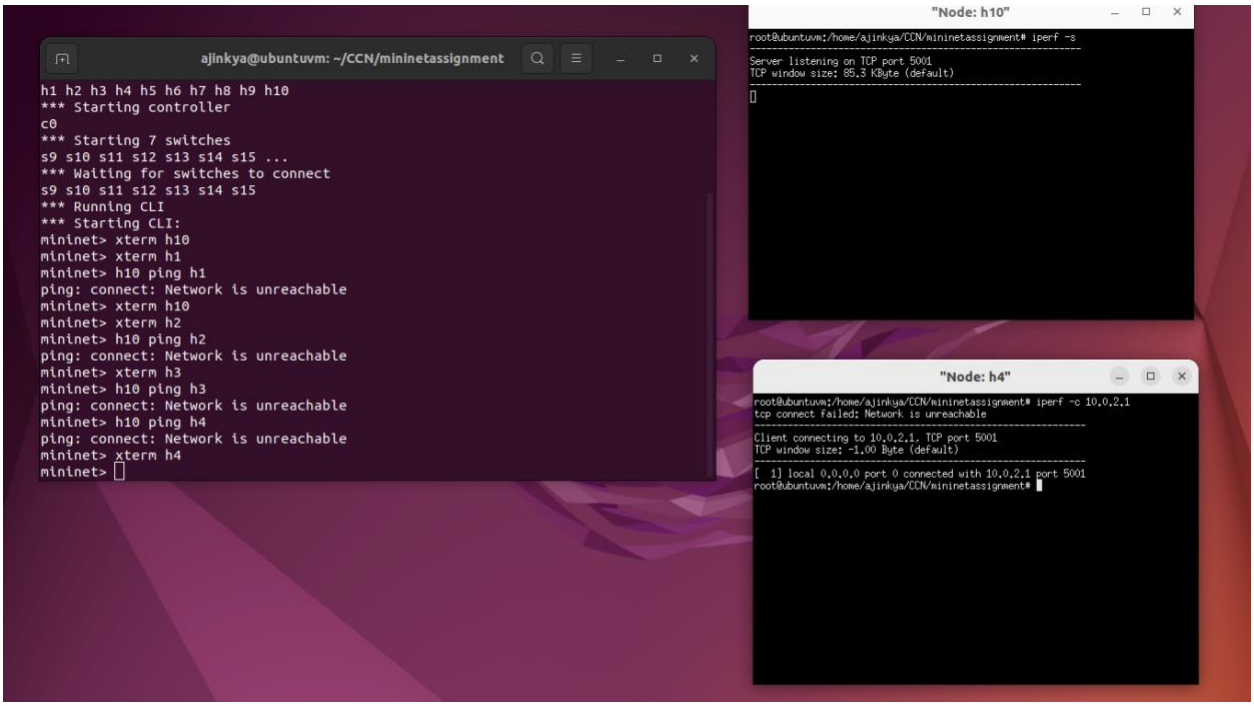
H10 -> H2:



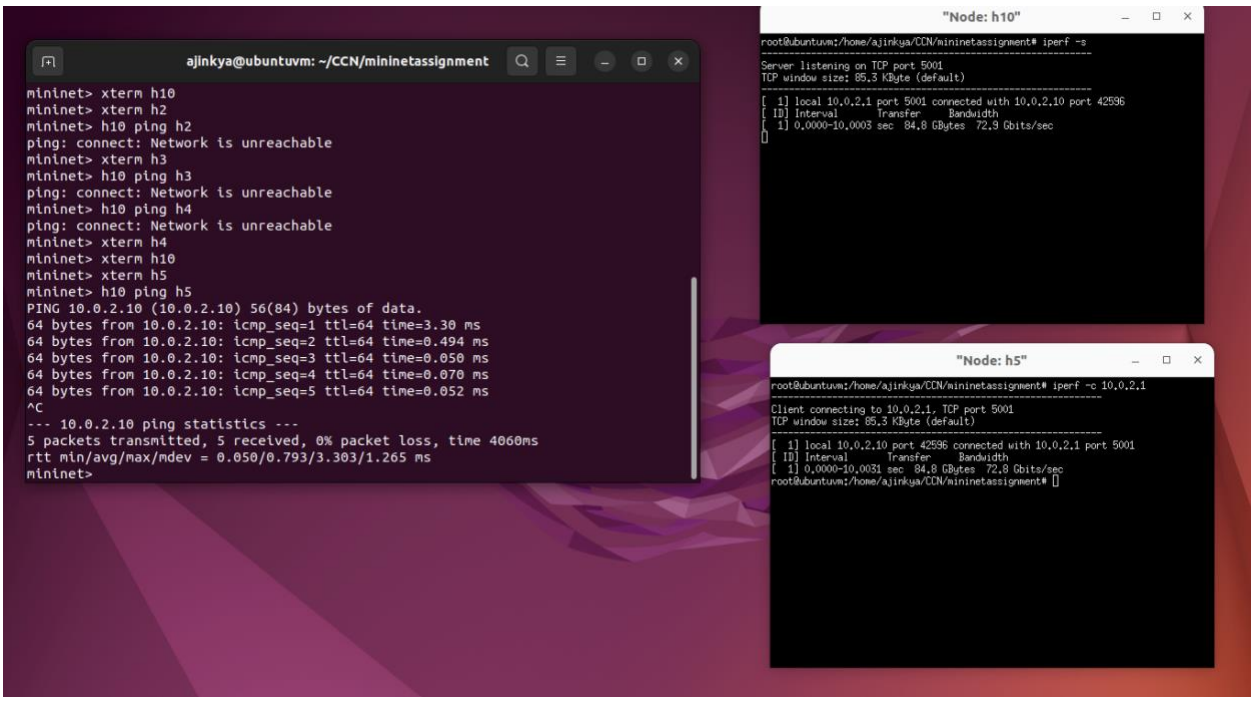
H10 -> H3


ajinkya@ubuntuvm: ~/CCN/mininetassignment
Linking host and switchesLinking Switches***
*** Starting network
*** Configuring hosts
h1 h2 h3 h4 h5 h6 h7 h8 h9 h10
*** Starting controller
c0
*** Starting 7 switches
s9 s10 s11 s12 s13 s14 s15 ...
*** Waiting for switches to connect
s9 s10 s11 s12 s13 s14 s15
*** Running CLI
*** Starting CLI:
mininet> xterm h10
mininet> xterm h1
mininet> h10 ping h1
ping: connect: Network is unreachable
mininet> xterm h10
mininet> xterm h2
mininet> h10 ping h2
ping: connect: Network is unreachable
mininet> xterm h3
mininet> h10 ping h3
ping: connect: Network is unreachable
mininet>
"Node: h10"
root@ubuntuvm:/home/ajinkya/CCN/mininetassignment# iperf -s
Server listening on TCP port 5001
TCP window size: 85.3 KByte (default)
"Node: h3"
root@ubuntuvm:/home/ajinkya/CCN/mininetassignment# iperf -c 10.0.2.1
tcp connect failed: Network is unreachable
Client connecting to 10.0.2.1, TCP port 5001
TCP window size: -1.00 Byte (default)
[1] local 0.0.0.0 port 0 connected with 10.0.2.1 port 5001
root@ubuntuvm:/home/ajinkya/CCN/mininetassignment#

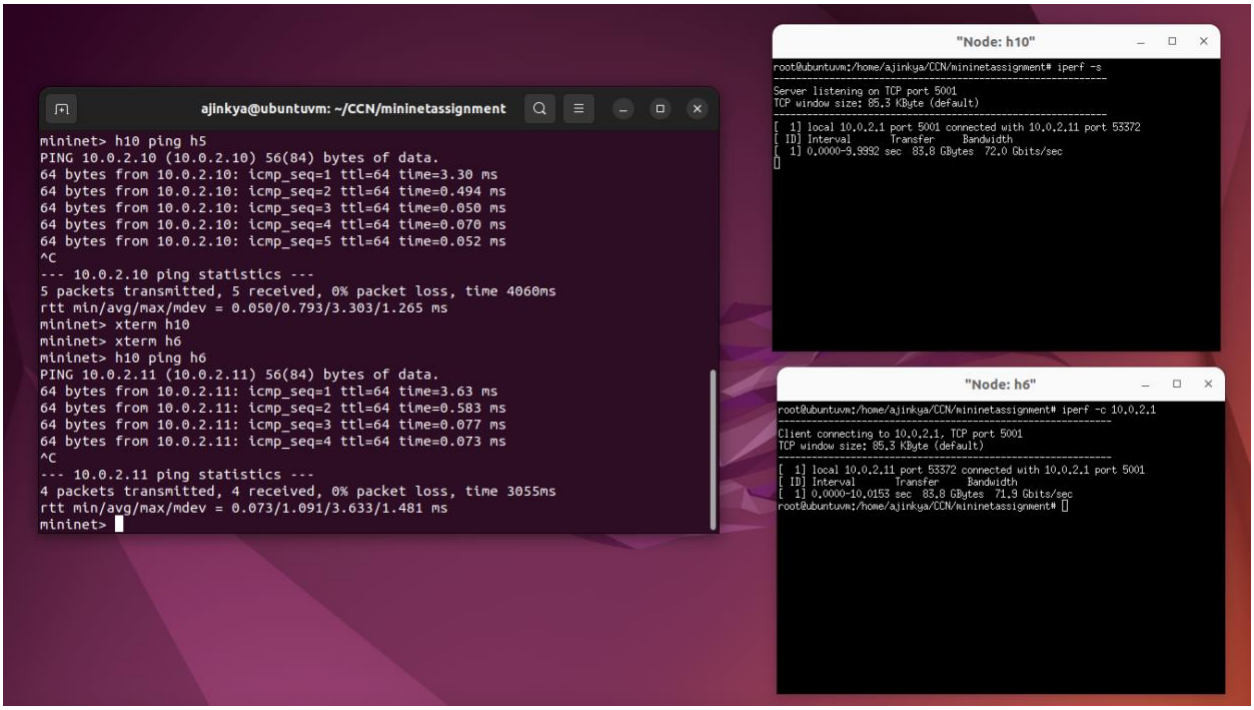
H10 -> H4


ajinkya@ubuntuvm: ~/CCN/mininetassignment
h1 h2 h3 h4 h5 h6 h7 h8 h9 h10
*** Starting controller
c0
*** Starting 7 switches
s9 s10 s11 s12 s13 s14 s15 ...
*** Waiting for switches to connect
s9 s10 s11 s12 s13 s14 s15
*** Running CLI
*** Starting CLI:
mininet> xterm h10
mininet> xterm h1
mininet> h10 ping h1
ping: connect: Network is unreachable
mininet> xterm h10
mininet> xterm h2
mininet> h10 ping h2
ping: connect: Network is unreachable
mininet> xterm h3
mininet> h10 ping h3
ping: connect: Network is unreachable
mininet> h10 ping h4
ping: connect: Network is unreachable
mininet> xterm h4
mininet>
"Node: h10"
root@ubuntuvm:/home/ajinkya/CCN/mininetassignment# iperf -s
Server listening on TCP port 5001
TCP window size: 85.3 KByte (default)
"Node: h4"
root@ubuntuvm:/home/ajinkya/CCN/mininetassignment# iperf -c 10.0.2.1
tcp connect failed: Network is unreachable
Client connecting to 10.0.2.1, TCP port 5001
TCP window size: -1.00 Byte (default)
[1] local 0.0.0.0 port 0 connected with 10.0.2.1 port 5001
root@ubuntuvm:/home/ajinkya/CCN/mininetassignment#

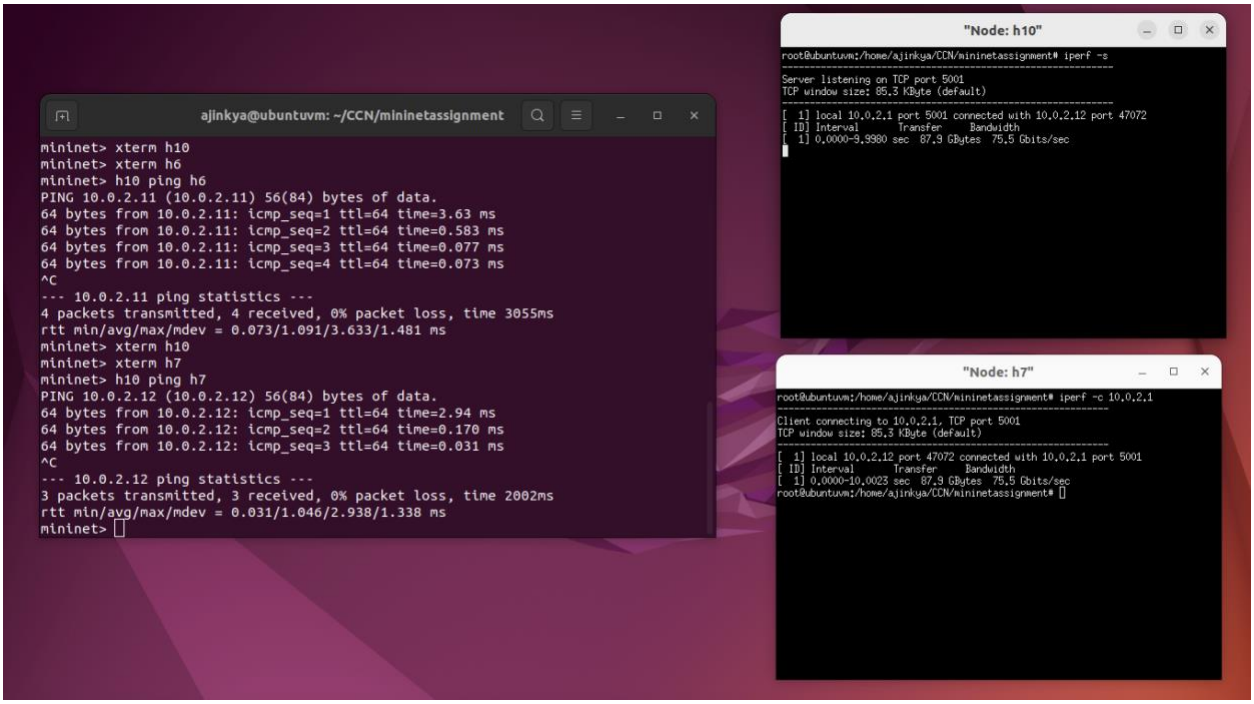
H10 -> H5


ajinkya@ubuntuvm: ~/CCN/mininetassignment
mininet> xterm h10
mininet> xterm h2
mininet> h10 ping h2
ping: connect: Network is unreachable
mininet> xterm h3
mininet> h10 ping h3
ping: connect: Network is unreachable
mininet> h10 ping h4
ping: connect: Network is unreachable
mininet> xterm h4
mininet> xterm h10
mininet> xterm h5
mininet> h10 ping h5
PING 10.0.2.10 (10.0.2.10) 56(84) bytes of data.
64 bytes from 10.0.2.10: icmp_seq=1 ttl=64 time=3.30 ms
64 bytes from 10.0.2.10: icmp_seq=2 ttl=64 time=0.494 ms
64 bytes from 10.0.2.10: icmp_seq=3 ttl=64 time=0.050 ms
64 bytes from 10.0.2.10: icmp_seq=4 ttl=64 time=0.070 ms
64 bytes from 10.0.2.10: icmp_seq=5 ttl=64 time=0.052 ms
^C
--- 10.0.2.10 ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 4060ms
rtt min/avg/max/mdev = 0.050/0.793/3.303/1.265 ms
mininet>
"Node: h10"
root@ubuntuvm:/home/ajinkya/CCN/mininetassignment# iperf -s
Server listening on TCP port 5001
TCP window size: 85.3 KByte (default)
[1] local 10.0.2.1 port 5001 connected with 10.0.2.10 port 42596
[ID] Interval Transfer Bandwidth
[1] 0.0000-10.0003 sec 84.8 GBytes 72.9 Gbits/sec
"Node: h5"
root@ubuntuvm:/home/ajinkya/CCN/mininetassignment# iperf -c 10.0.2.1
Client connecting to 10.0.2.1, TCP port 5001
TCP window size: 85.3 KByte (default)
[1] local 10.0.2.10 port 42596 connected with 10.0.2.1 port 5001
[ID] Interval Transfer Bandwidth
[1] 0.0000-10.0031 sec 84.8 GBytes 72.8 Gbits/sec
root@ubuntuvm:/home/ajinkya/CCN/mininetassignment#

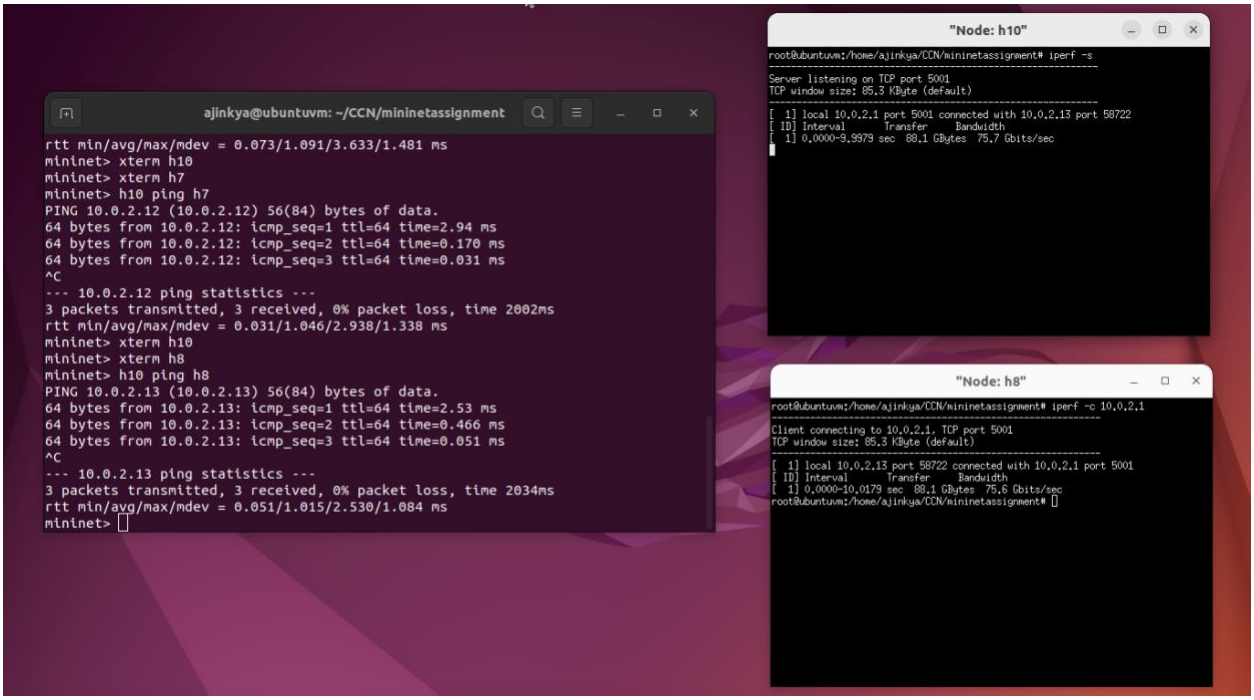
H10->H6


ajinkya@ubuntuvm: ~/CCN/mininetassignment
mininet> h10 ping h5
PING 10.0.2.10 (10.0.2.10) 56(84) bytes of data.
64 bytes from 10.0.2.10: icmp_seq=1 ttl=64 time=3.30 ms
64 bytes from 10.0.2.10: icmp_seq=2 ttl=64 time=0.494 ms
64 bytes from 10.0.2.10: icmp_seq=3 ttl=64 time=0.050 ms
64 bytes from 10.0.2.10: icmp_seq=4 ttl=64 time=0.070 ms
64 bytes from 10.0.2.10: icmp_seq=5 ttl=64 time=0.052 ms
^C
--- 10.0.2.10 ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 4060ms
rtt min/avg/max/mdev = 0.050/0.793/3.303/1.265 ms
mininet> xterm h10
mininet> xterm h6
mininet> h10 ping h6
PING 10.0.2.11 (10.0.2.11) 56(84) bytes of data.
64 bytes from 10.0.2.11: icmp_seq=1 ttl=64 time=3.63 ms
64 bytes from 10.0.2.11: icmp_seq=2 ttl=64 time=0.583 ms
64 bytes from 10.0.2.11: icmp_seq=3 ttl=64 time=0.077 ms
64 bytes from 10.0.2.11: icmp_seq=4 ttl=64 time=0.073 ms
^C
--- 10.0.2.11 ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 3055ms
rtt min/avg/max/mdev = 0.073/1.091/3.633/1.481 ms
mininet>
"Node: h10"
root@ubuntuvm:/home/ajinkya/CCN/mininetassignment# iperf -s
Server listening on TCP port 5001
TCP window size: 85.3 KByte (default)
[1] local 10.0.2.1 port 5001 connected with 10.0.2.11 port 53372
[ID] Interval Transfer Bandwidth
[1] 0.0000-9.9992 sec 83.8 GBytes 72.0 Gbits/sec
"Node: h6"
root@ubuntuvm:/home/ajinkya/CCN/mininetassignment# iperf -c 10.0.2.1
Client connecting to 10.0.2.1, TCP port 5001
TCP window size: 85.3 KByte (default)
[1] local 10.0.2.11 port 53372 connected with 10.0.2.1 port 5001
[ID] Interval Transfer Bandwidth
[1] 0.0000-10.0153 sec 83.8 GBytes 71.9 Gbits/sec
root@ubuntuvm:/home/ajinkya/CCN/mininetassignment#

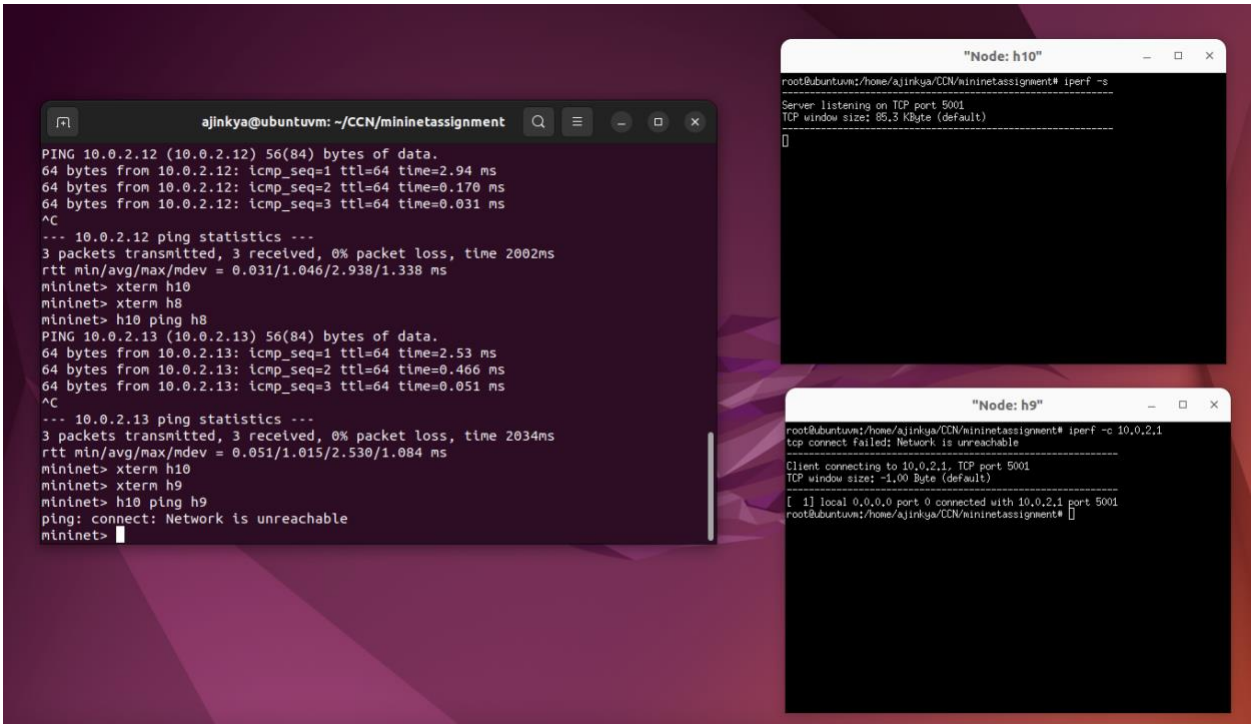
H10 -> H7


ajinkya@ubuntuvm: ~/CCN/mininetassignment
mininet> xterm h10
mininet> xterm h6
mininet> h10 ping h6
PING 10.0.2.11 (10.0.2.11) 56(84) bytes of data.
64 bytes from 10.0.2.11: icmp_seq=1 ttl=64 time=3.63 ms
64 bytes from 10.0.2.11: icmp_seq=2 ttl=64 time=0.583 ms
64 bytes from 10.0.2.11: icmp_seq=3 ttl=64 time=0.077 ms
64 bytes from 10.0.2.11: icmp_seq=4 ttl=64 time=0.073 ms
^C
--- 10.0.2.11 ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 3055ms
rtt min/avg/max/mdev = 0.073/1.091/3.633/1.481 ms
mininet> xterm h10
mininet> xterm h7
mininet> h10 ping h7
PING 10.0.2.12 (10.0.2.12) 56(84) bytes of data.
64 bytes from 10.0.2.12: icmp_seq=1 ttl=64 time=2.94 ms
64 bytes from 10.0.2.12: icmp_seq=2 ttl=64 time=0.170 ms
64 bytes from 10.0.2.12: icmp_seq=3 ttl=64 time=0.031 ms
^C
--- 10.0.2.12 ping statistics ---
3 packets transmitted, 3 received, 0% packet loss, time 2002ms
rtt min/avg/max/mdev = 0.031/1.046/2.938/1.338 ms
mininet>
"Node: h10"
root@ubuntuvm:/home/ajinkya/CCN/mininetassignment# iperf -s
Server listening on TCP port 5001
TCP window size: 85.3 KByte (default)
[1] local 10.0.2.1 port 5001 connected with 10.0.2.12 port 47072
[ID] Interval Transfer Bandwidth
[1] 0.0000-9.9980 sec 87.9 GBytes 75.5 Gbits/sec
"Node: h7"
root@ubuntuvm:/home/ajinkya/CCN/mininetassignment# iperf -c 10.0.2.1
Client connecting to 10.0.2.1, TCP port 5001
TCP window size: 85.3 KByte (default)
[1] local 10.0.2.12 port 47072 connected with 10.0.2.1 port 5001
[ID] Interval Transfer Bandwidth
[1] 0.0000-10.0023 sec 87.9 GBytes 75.5 Gbits/sec
root@ubuntuvm:/home/ajinkya/CCN/mininetassignment#

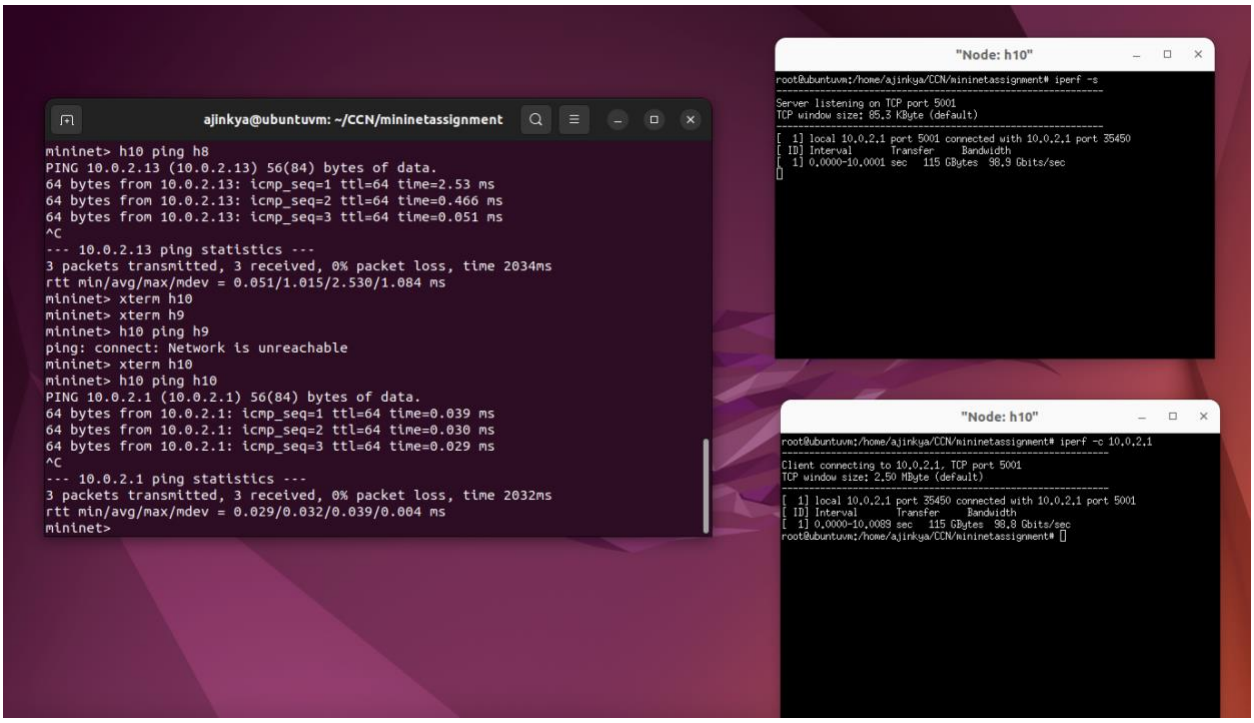
H10 -> H8


ajinkya@ubuntuvm: ~/CCN/mininetassignment
rtt min/avg/max/mdev = 0.073/1.091/3.633/1.481 ms
mininet> xterm h10
mininet> xterm h7
mininet> h10 ping h7
PING 10.0.2.12 (10.0.2.12) 56(84) bytes of data.
64 bytes from 10.0.2.12: icmp_seq=1 ttl=64 time=2.94 ms
64 bytes from 10.0.2.12: icmp_seq=2 ttl=64 time=0.170 ms
64 bytes from 10.0.2.12: icmp_seq=3 ttl=64 time=0.031 ms
^C
--- 10.0.2.12 ping statistics ---
3 packets transmitted, 3 received, 0% packet loss, time 2002ms
rtt min/avg/max/mdev = 0.031/1.046/2.938/1.338 ms
mininet> xterm h10
mininet> xterm h8
mininet> h10 ping h8
PING 10.0.2.13 (10.0.2.13) 56(84) bytes of data.
64 bytes from 10.0.2.13: icmp_seq=1 ttl=64 time=2.53 ms
64 bytes from 10.0.2.13: icmp_seq=2 ttl=64 time=0.466 ms
64 bytes from 10.0.2.13: icmp_seq=3 ttl=64 time=0.051 ms
^C
--- 10.0.2.13 ping statistics ---
3 packets transmitted, 3 received, 0% packet loss, time 2034ms
rtt min/avg/max/mdev = 0.051/1.015/2.530/1.084 ms
mininet>
"Node: h10"
root@ubuntuvm:/home/ajinkya/CCN/mininetassignment# iperf -s
Server listening on TCP port 5001
TCP window size: 85.3 KByte (default)
[1] local 10.0.2.1 port 5001 connected with 10.0.2.13 port 58722
[ID] Interval Transfer Bandwidth
[1] 0.0000-9.9979 sec 88.1 GBytes 75.7 Gbits/sec
"Node: h8"
root@ubuntuvm:/home/ajinkya/CCN/mininetassignment# iperf -c 10.0.2.1
Client connecting to 10.0.2.1, TCP port 5001
TCP window size: 85.3 KByte (default)
[1] local 10.0.2.13 port 58722 connected with 10.0.2.1 port 5001
[ID] Interval Transfer Bandwidth
[1] 0.0000-10.0179 sec 88.1 GBytes 75.6 Gbits/sec
root@ubuntuvm:/home/ajinkya/CCN/mininetassignment#

H10 -> H9



H10 -> H10



Host	IP address	Is this host pingable from h9?	Is this host pingable from h10?	Scenario: 1 Measure bw and delay using iperf on H9	Scenario: 2 Measure bw and delay using iperf on H10
H1	10.0.1.10	Yes	No	Bandwidth: 72.8Gbits/sec Delay: 3.56ms	Unreachable
H2	10.0.1.11	Yes	No	Bandwidth: 76.9Gbits/sec Delay: 5.82ms	Unreachable
H3	10.0.1.12	Yes	No	Bandwidth: 74.2Gbits/sec Delay: 3.95ms	Unreachable
H4	10.0.1.13	Yes	No	Bandwidth: 73.2Gbits/sec Delay: 3.25ms	Unreachable
H5	10.0.2.10	No	Yes	Unreachable	Bandwidth: 72.9Gbits/sec Delay: 3.30ms
H6	10.0.2.11	No	Yes	Unreachable	Bandwidth: 72.0Gbits/sec Delay: 3.63ms
H7	10.0.2.12	No	Yes	Unreachable	Bandwidth: 75.5Gbits/sec Delay: 2.94ms
H8	10.0.2.13	No	Yes	Unreachable	Bandwidth: 75.7Gbits/sec Delay: 2.53ms
H9	10.0.1.1	Yes	No	Bandwidth: 101Gbits/sec Delay: 0.021ms	Unreachable
H10	10.0.2.1	No	-	Unreachable	Bandwidth: 98.9Gbits/sec

					Delay: 0.039ms

5. H9 is in subnet1 and H10 is in subnet 2 hence H1 cannot reach H10 or H6 cannot reach H9. It is similar to many other nodes. This is marked as unreachable in the above table.