Testing ping all- this shows host 1,2,3, and 5 able to ping each other but fails when for host 4 because traffic sent from host 4 is dropped

mininet@mininet-vm: ~

File Edit Tabs Help

'v': 4}

IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIPPPPPPPPPPPPPPPPPP
'AHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH'
65531
{'csum': 55567,
 'dstip': IPAddr('123.45.67.89'),
 'flags': 2,
 'frag': 0,
 'hl': 5,
 'id': 37852,
 'iplen': 84,
 'next': <pox.lib.packet.icmp.icmp object at 0xb5c433cc>,
 'parsed': True,
 'prev': <pox.lib.packet.ethernet.ethernet object at 0xb5c43bcc>,
 'protocol': 1,
 'raw': 'E\x00\x00T\x93\xdc@\x00@\x01\xd9\x0f\n\x05\x052{-CY\x08\x00\x85\x9f\x10
P\x00\x018&\xeb]Q\x88\x02\x00\x08\t\n\x0b\x0c\r\x0e\x0f\x10\x11\x12\x13\x14\x15\
x16\x17\x18\x19\x1a\x1b\x1c\x1d\x1e\x1f !"#$%&\'()*+,-./01234567',
 'srcip': IPAddr('10.5.5.50'),
 'tos': 0,
 'ttl': 64,
 'v': 4}

File Edit Tabs Help

mininet@mininet-vm:~$ sudo python ~/final_skel.py
mininet> pingall
*** Ping: testing ping reachability
h1 -> h2 h3 X h5
h2 -> h1 h3 X h5
h3 -> h1 h2 X h5
h4 -> X X X X
h5 -> h1 h2 h3 X
*** Results: 40% dropped (12/20 received)
mininet>

This section will show that all hosts of the company can send and receive information from each other(h1,h2,h3,h5)

Testing ping from h1 to h5 – shows IP and ICMP packets go through

```
IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIPPPPPPPPPPPPPPPPP
ICCCCCCCCCCCCCCCMMMMMMMMMMMMMMMMMMMMMMMMMMMP
'AHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH'
65531
{'csum': 29292,
 'dstip': IPAddr('10.1.1.10'),
 'flags': 0,
 'frag': 0,
 'hl': 5,
 'id': 60923,
 'iplen': 84,
 'next': <pox.lib.packet.icmp.icmp object at 0xb5ac43cc>,
 'parsed': True,
 'prev': <pox.lib.packet.ethernet.ethernet object at 0xb5c7c98c>,
 'protocol': 1,
 'raw': 'E\x00\x00T\xed\xfb\x00\x00@\x01rl\n\x05\x052\n\x01\x01\nV
0\x15\x81\x00\x01\xa8*\xeb]Nr\x04\x00\x08\t\n\x0b\x0c\r\x0e\x0f\x1
x14\x15\x16\x17\x18\x19\x1a\x1b\x1c\x1d\x1e\x1f !"#$%&\'()*+,-./01
 'srcip': IPAddr('10.5.5.50'),
 'tos': 0,
 'ttl': 64,
```

```
mininet> h1 ping -c 5 h5
PING 10.5.5.50 (10.5.5.50) 56(84) bytes of data.
64 bytes from 10.5.5.50: icmp_seq=1 ttl=64 time=66.3 ms
64 bytes from 10.5.5.50: icmp_seq=2 ttl=64 time=0.505 ms
64 bytes from 10.5.5.50: icmp_seq=3 ttl=64 time=0.050 ms
64 bytes from 10.5.5.50: icmp_seq=4 ttl=64 time=0.056 ms
64 bytes from 10.5.5.50: icmp_seq=5 ttl=64 time=0.068 ms

--- 10.5.5.50 ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 4001ms
rtt min/avg/max/mdev = 0.050/13.413/66.389/26.488 ms
mininet>
```

Testing ping from h2 to h3 - shows IP and ICMP packets go through

IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIPPPPPPPPPPPPPPPPPP
ICCCCCCCCCCCCCCCMMMMMMMMMMMMMMMMMMMMMMMMMMMP
'AHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH'
65531
{'csum': 17170,
 'dstip': IPAddr('10.2.2.20'),
 'flags': 0,
 'frag': 0,
 'hl': 5,
 'id': 7777,
 'iplen': 84,
 'next': <pox.lib.packet.icmp.icmp object at 0xb5c4724c>,
 'parsed': True,
 'prev': <pox.lib.packet.ethernet.ethernet object at 0xb5cb1dac>,
 'protocol': 1,
 'raw': 'E\x00\x00T\x1ea\x00\x00@\x01C\x12\n\x03\x03\x1e\n\x02\x02\x14
a0\xa9\x151\x00\x01\xe4)\xeb]\x8c\x99\x03\x00\x08\t\n\x0b\x0c\r\x0e\x0
x12\x13\x14\x15\x16\x17\x18\x19\x1a\x1b\x1c\x1d\x1e\x1f !"#$%&\'()*+,-
',
 'srcip': IPAddr('10.3.3.30'),
```
mininet@mininet-vm:~$ sudo python ~/final_skel.py
mininet> h2 ping -c 5 h3
PING 10.3.3.30 (10.3.3.30) 56(84) bytes of data.
64 bytes from 10.3.3.30: icmp_seq=1 ttl=64 time=124 ms
64 bytes from 10.3.3.30: icmp_seq=2 ttl=64 time=0.429 ms
64 bytes from 10.3.3.30: icmp_seq=3 ttl=64 time=0.064 ms
64 bytes from 10.3.3.30: icmp_seq=4 ttl=64 time=0.060 ms
64 bytes from 10.3.3.30: icmp_seq=5 ttl=64 time=0.055 ms

--- 10.3.3.30 ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 4000ms
rtt min/avg/max/mdev = 0.055/24.933/124.057/49.562 ms
mininet>
```

Testing iperf h1 to h5 - shows IP and TCP packets go through

```
IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIPPPPPPPPPPPPPPPPP
TCCCCCCCCCCCCPPPPPPPPPPPPPPPPPPPP
'AHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH'
65531
{'csum': 62910,
 'dstip': IPAddr('10.1.1.10'),
 'flags': 2,
 'frag': 0,
 'hl': 5,
 'id': 10948,
 'iplen': 52,
 'next': <pox.lib.packet.tcp.tcp object at 0xb56e72cc>,
 'parsed': True,
 'prev': <pox.lib.packet.ethernet.ethernet object at 0xb56
 'protocol': 6,
 'raw': 'E\x00\x004*\xc4@\x00@\x06\xf5\xbe\n\x05\x052\n\x
t\xb5s+P\xcd\x80\x10,\x9f\xff\x96\x00\x00\x01\x01\x08\n\x
 'srcip': IPAddr('10.5.5.50'),
 'tos': 0,
 'ttl': 64,
 'v': 4}

mininet> iperf
*** Iperf: testing TCP bandwidth between h1 and h5
*** Results: ['3.79 Gbits/sec', '3.79 Gbits/sec']
mininet>
```

Testing iperf h2 to h3- shows IP and TCP packets go through from h3 to h2

IIIIIIIIIIIIIIIIIIIIIIIIIIIIIPPPPPPPPPPPPPPPPPP
TCCCCCCCCCCCPPPPPPPPPPPPPPPPPPPP
'AHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH'
65531
{'csum': 8582,
 'dstip': IPAddr('10.2.2.20'),
 'flags': 2,
 'frag': 0,
 'hl': 5,
 'id': 0,
 'iplen': 60,
 'next': <pox.lib.packet.tcp.tcp object at 0xb5ac5b4c>,
 'parsed': True,
 'prev': <pox.lib.packet.ethernet.ethernet object at 0xl
 'protocol': 6,
 'raw': 'E\x00\x00<\x00\x00@\x00@\x06!\x86\n\x03\x03\x1
bd\xe8\xb2\xe6o0\xbd5\xd6\xec\xa0\x12q \xd0J\x00\x00\x0
\n\x00\x07\xb2\xbd\x00\x07\xb2\xb6\x01\x03\x03\t',
 'srcip': IPAddr('10.3.3.30'),
 'tos': 0,
 'ttl': 64,
 'v': 4}

```
 ncsuccs.    j   J.rJ  ouics/sec ,    J.rJ  ouics/sec j
mininet> iperf h2 h3
*** Iperf: testing TCP bandwidth between h2 and h3
*** Results: ['6.09 Gbits/sec', '6.10 Gbits/sec']
mininet>
```

Testing iperf h3 to h5- shows IP and TCP packets go through from h5 to h3

```
IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIPPPPPPPPPPPPPPPPP
TCCCCCCCCCCCCPPPPPPPPPPPPPPPPPPPPP
'AHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH'
65531
{'csum': 44699,
 'dstip': IPAddr('10.3.3.30'),
 'flags': 2,
 'frag': 0,
 'hl': 5,
 'id': 28625,
 'iplen': 52,
 'next': <pox.lib.packet.tcp.tcp object at 0xb5ac4e4c>,
 'parsed': True,
 'prev': <pox.lib.packet.ethernet.ethernet object at 0x
 'protocol': 6,
 'raw': 'E\x00\x004o\xd1@\x00@\x06\xae\x9b\n\x05\x052\r
\xdfN\x8e\x85\xcb\xcc\x1c\x89\x80\x10\x03\\za\x00\x00\x
xbe\x00\x07\xe1\xbd',
 'srcip': IPAddr('10.5.5.50'),
 'tos': 0,
 'ttl': 64,
 'v': 4}

          ᴿᵉˢᵘˡᵗˢ: [ ⁰·⁰⁹ ᵍᵇⁱᵗˢ/ˢᵉᶜ ,   ⁰·¹⁰ ᵍᵇⁱᵗˢ/ˢᵉᶜ ]
mininet> iperf h3 h5
*** Iperf: testing TCP bandwidth between h3 and h5
*** Results: ['5.91 Gbits/sec', '5.91 Gbits/sec']
mininet>
```

Testing ping from h1 to h5 – shows IP and ICMP from h5 to h1 does not succeed

```
mininet> iperf h5 h4
*** Iperf: testing TCP bandwidth between h5 and h4
^C
Interrupt
mininet>
```

Dpctl dump-flows – continues but unable to screen shoot all

```
mininet> dpctl dump-flows
*** s1 ------------------------------------------------------------------------
NXST_FLOW reply (xid=0x4):
 cookie=0x0, duration=60.11s, table=0, n_packets=1, n_bytes=98, idle_timeout=100, hard_timeout=600, idle_age=60, priority=65535,icmp,in_port=11,vlan_tci=0x0000,dl_src=00:00:00:00:00:02,dl_dst=00:00:00:00:00:01,nw_src=10.2.2.20,nw_dst=10.
1.1.10,nw_tos=0,icmp_type=8,icmp_code=0 actions=FLOOD
 cookie=0x0, duration=53.598s, table=0, n_packets=1, n_bytes=98, idle_timeout=100, hard_timeout=600, idle_age=53, priority=65535,icmp,in_port=11,vlan_tci=0x0000,dl_src=00:00:00:00:00:05,dl_dst=00:00:00:00:00:02,nw_src=10.5.5.50,nw_dst=10
.2.2.20,nw_tos=0,icmp_type=8,icmp_code=0 actions=FLOOD
 cookie=0x0, duration=56.793s, table=0, n_packets=1, n_bytes=98, idle_timeout=100, hard_timeout=600, idle_age=56, priority=65535,icmp,in_port=1,vlan_tci=0x0000,dl_src=00:00:00:00:00:01,dl_dst=00:00:00:00:00:03,nw_src=10.1.1.10,nw_dst=10.
3.3.30,nw_tos=0,icmp_type=0,icmp_code=0 actions=FLOOD
 cookie=0x0, duration=63.287s, table=0, n_packets=1, n_bytes=98, idle_timeout=100, hard_timeout=600, idle_age=63, priority=65535,icmp,in_port=11,vlan_tci=0x0000,dl_src=00:00:00:00:00:03,dl_dst=00:00:00:00:00:01,nw_src=10.3.3.30,nw_dst=10
.1.1.10,nw_tos=0,icmp_type=0,icmp_code=0 actions=FLOOD
 cookie=0x0, duration=59.974s, table=0, n_packets=1, n_bytes=98, idle_timeout=100, hard_timeout=600, idle_age=59, priority=65535,icmp,in_port=11,vlan_tci=0x0000,dl_src=00:00:00:00:00:02,dl_dst=00:00:00:00:00:03,nw_src=10.2.2.20,nw_dst=10
.3.3.30,nw_tos=0,icmp_type=0,icmp_code=0 actions=FLOOD
 cookie=0x0, duration=56.839s, table=0, n_packets=1, n_bytes=98, idle_timeout=100, hard_timeout=600, idle_age=56, priority=65535,icmp,in_port=11,vlan_tci=0x0000,dl_src=00:00:00:00:00:02,dl_dst=00:00:00:00:00:05,nw_src=10.2.2.20,nw_dst=10
.5.5.50,nw_tos=0,icmp_type=8,icmp_code=0 actions=FLOOD
 cookie=0x0, duration=63.305s, table=0, n_packets=1, n_bytes=98, idle_timeout=100, hard_timeout=600, idle_age=63, priority=65535,icmp,in_port=1,vlan_tci=0x0000,dl_src=00:00:00:00:00:01,dl_dst=00:00:00:00:00:03,nw_src=10.1.1.10,nw_dst=10.
3.3.30,nw_tos=0,icmp_type=8,icmp_code=0 actions=FLOOD
 cookie=0x0, duration=60.088s, table=0, n_packets=1, n_bytes=98, idle_timeout=100, hard_timeout=600, idle_age=60, priority=65535,icmp,in_port=1,vlan_tci=0x0000,dl_src=00:00:00:00:00:01,dl_dst=00:00:00:00:00:02,nw_src=10.1.1.10,nw_dst=10.
2.2.20,nw_tos=0,icmp_type=0,icmp_code=0 actions=FLOOD
 cookie=0x0, duration=53.666s, table=0, n_packets=1, n_bytes=98, idle_timeout=100, hard_timeout=600, idle_age=53, priority=65535,icmp,in_port=11,vlan_tci=0x0000,dl_src=00:00:00:00:00:03,dl_dst=00:00:00:00:00:05,nw_src=10.3.3.30,nw_dst=10
.5.5.50,nw_tos=0,icmp_type=8,icmp_code=0 actions=FLOOD
 cookie=0x0, duration=108.354s, table=0, n_packets=2, n_bytes=196, idle_timeout=100, hard_timeout=600, idle_age=63, priority=65535,icmp,in_port=1,vlan_tci=0x0000,dl_src=00:00:00:00:00:01,dl_dst=00:00:00:00:00:02,nw_src=10.1.1.10,nw_dst=1
0.2.2.20,nw_tos=0,icmp_type=8,icmp_code=0 actions=FLOOD
 cookie=0x0, duration=53.564s, table=0, n_packets=1, n_bytes=98, idle_timeout=100, hard_timeout=600, idle_age=53, priority=65535,icmp,in_port=11,vlan_tci=0x0000,dl_src=00:00:00:00:00:03,dl_dst=00:00:00:00:00:05,nw_src=10.3.3.30,nw_dst=10
.5.5.50,nw_tos=0,icmp_type=0,icmp_code=0 actions=FLOOD
 cookie=0x0, duration=53.572s, table=0, n_packets=1, n_bytes=98, idle_timeout=100, hard_timeout=600, idle_age=53, priority=65535,icmp,in_port=11,vlan_tci=0x0000,dl_src=00:00:00:00:00:05,dl_dst=00:00:00:00:00:03,nw_src=10.5.5.50,nw_dst=10
.3.3.30,nw_tos=0,icmp_type=0,icmp_code=0 actions=FLOOD
 cookie=0x0, duration=53.617s, table=0, n_packets=1, n_bytes=98, idle_timeout=100, hard_timeout=600, idle_age=53, priority=65535,icmp,in_port=1,vlan_tci=0x0000,dl_src=00:00:00:00:00:01,dl_dst=00:00:00:00:00:05,nw_src=10.1.1.10,nw_dst=10.
5.5.50,nw_tos=0,icmp_type=0,icmp_code=0 actions=FLOOD
 cookie=0x0, duration=56.76s, table=0, n_packets=1, n_bytes=98, idle_timeout=100, hard_timeout=600, idle_age=56, priority=65535,icmp,in_port=11,vlan_tci=0x0000,dl_src=00:00:00:00:00:02,dl_dst=00:00:00:00:00:03,nw_src=10.2.2.20,nw_dst=10.
3.3.30,nw_tos=0,icmp_type=0,icmp_code=0 actions=FLOOD
 cookie=0x0, duration=59.956s, table=0, n_packets=1, n_bytes=98, idle_timeout=100, hard_timeout=600, idle_age=59, priority=65535,icmp,in_port=11,vlan_tci=0x0000,dl_src=00:00:00:00:00:03,dl_dst=00:00:00:00:00:02,nw_src=10.3.3.30,nw_dst=10
.2.2.20,nw_tos=0,icmp_type=0,icmp_code=0 actions=FLOOD
 cookie=0x0, duration=53.621s, table=0, n_packets=1, n_bytes=98, idle_timeout=100, hard_timeout=600, idle_age=53, priority=65535,icmp,in_port=11,vlan_tci=0x0000,dl_src=00:00:00:00:00:05,dl_dst=00:00:00:00:00:01,nw_src=10.5.5.50,nw_dst=10
.1.1.10,nw_tos=0,icmp_type=8,icmp_code=0 actions=FLOOD
 cookie=0x0, duration=53.642s, table=0, n_packets=1, n_bytes=98, idle_timeout=100, hard_timeout=600, idle_age=53, priority=65535,icmp,in_port=11,vlan_tci=0x0000,dl_src=00:00:00:00:00:05,dl_dst=00:00:00:00:00:03,nw_src=10.5.5.50,nw_dst=10
.3.3.30,nw_tos=0,icmp_type=0,icmp_code=0 actions=FLOOD
 cookie=0x0, duration=56.801s, table=0, n_packets=1, n_bytes=98, idle_timeout=100, hard_timeout=600, idle_age=56, priority=65535,icmp,in_port=11,vlan_tci=0x0000,dl_src=00:00:00:00:00:03,dl_dst=00:00:00:00:00:01,nw_src=10.3.3.30,nw_dst=10
.1.1.10,nw_tos=0,icmp_type=0,icmp_code=0 actions=FLOOD
 cookie=0x0, duration=56.818s, table=0, n_packets=1, n_bytes=98, idle_timeout=100, hard_timeout=600, idle_age=56, priority=65535,icmp,in_port=11,vlan_tci=0x0000,dl_src=00:00:00:00:00:05,dl_dst=00:00:00:00:00:02,nw_src=10.5.5.50,nw_dst=10
.2.2.20,nw_tos=0,icmp_type=0,icmp_code=0 actions=FLOOD
 cookie=0x0, duration=108.321s, table=0, n_packets=2, n_bytes=196, idle_timeout=100, hard_timeout=600, idle_age=63, priority=65535,icmp,in_port=11,vlan_tci=0x0000,dl_src=00:00:00:00:00:02,dl_dst=00:00:00:00:00:01,nw_src=10.2.2.20,nw_dst=
10.1.1.10,nw_tos=0,icmp_type=0,icmp_code=0 actions=FLOOD
 cookie=0x0, duration=60.193s, table=0, n_packets=1, n_bytes=98, idle_timeout=100, hard_timeout=600, idle_age=60, priority=65535,icmp,in_port=11,vlan_tci=0x0000,dl_src=00:00:00:00:00:05,dl_dst=00:00:00:00:00:01,nw_src=10.5.5.50,nw_dst=10
.1.1.10,nw_tos=0,icmp_type=0,icmp_code=0 actions=FLOOD
 cookie=0x0, duration=104.318s, table=0, n_packets=73939, n_bytes=4904374, idle_timeout=100, hard_timeout=600, idle_age=99, priority=65535,tcp,in_port=11,vlan_tci=0x0000,dl_src=00:00:00:00:00:05,dl_dst=00:00:00:00:00:01,nw_src=10.5.5.50,
```