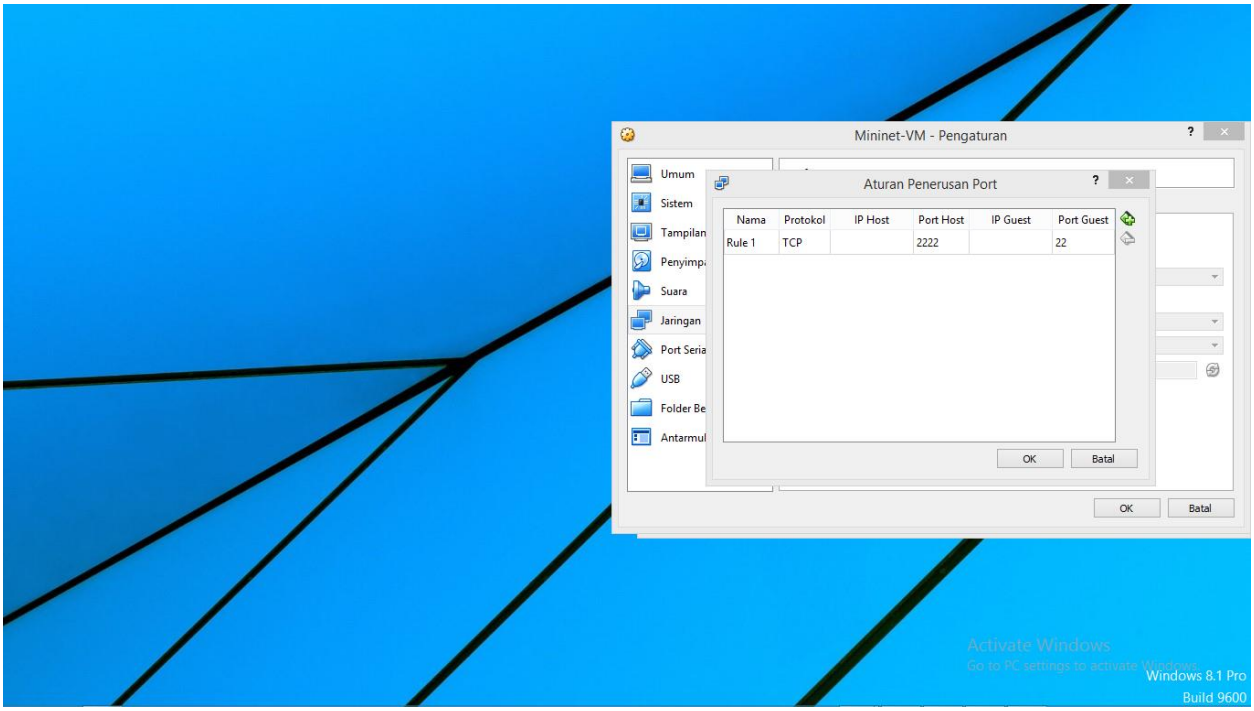
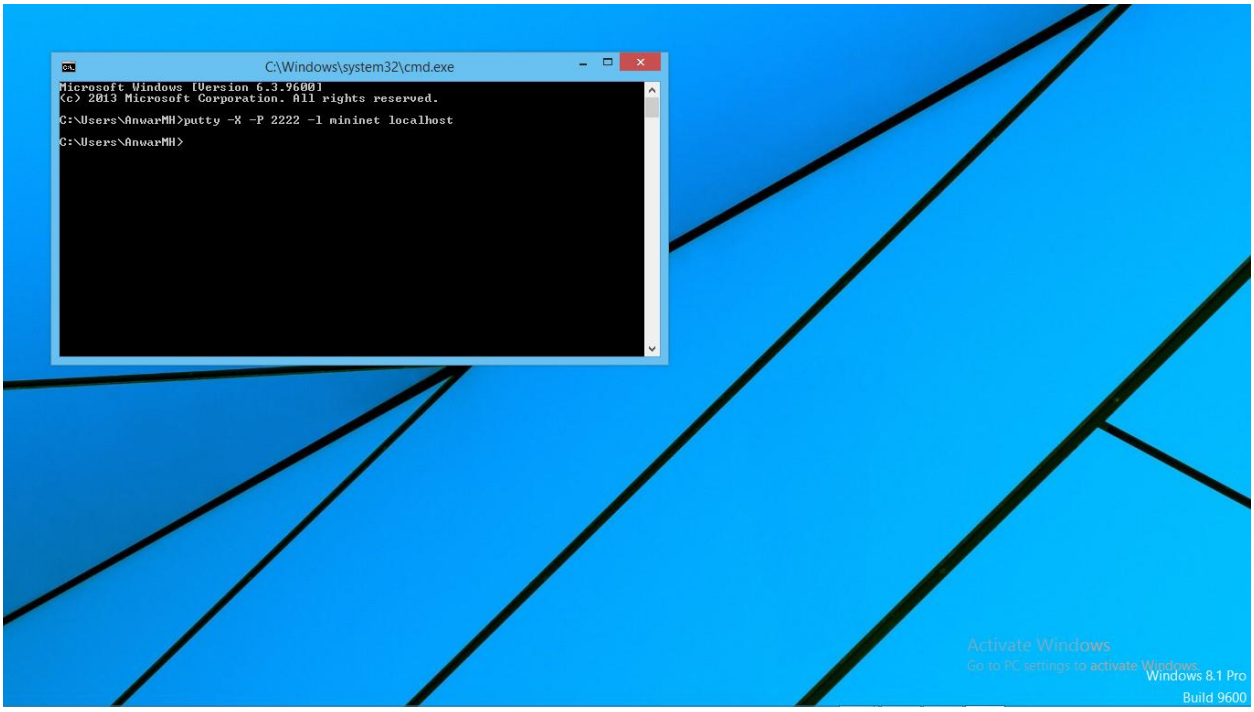
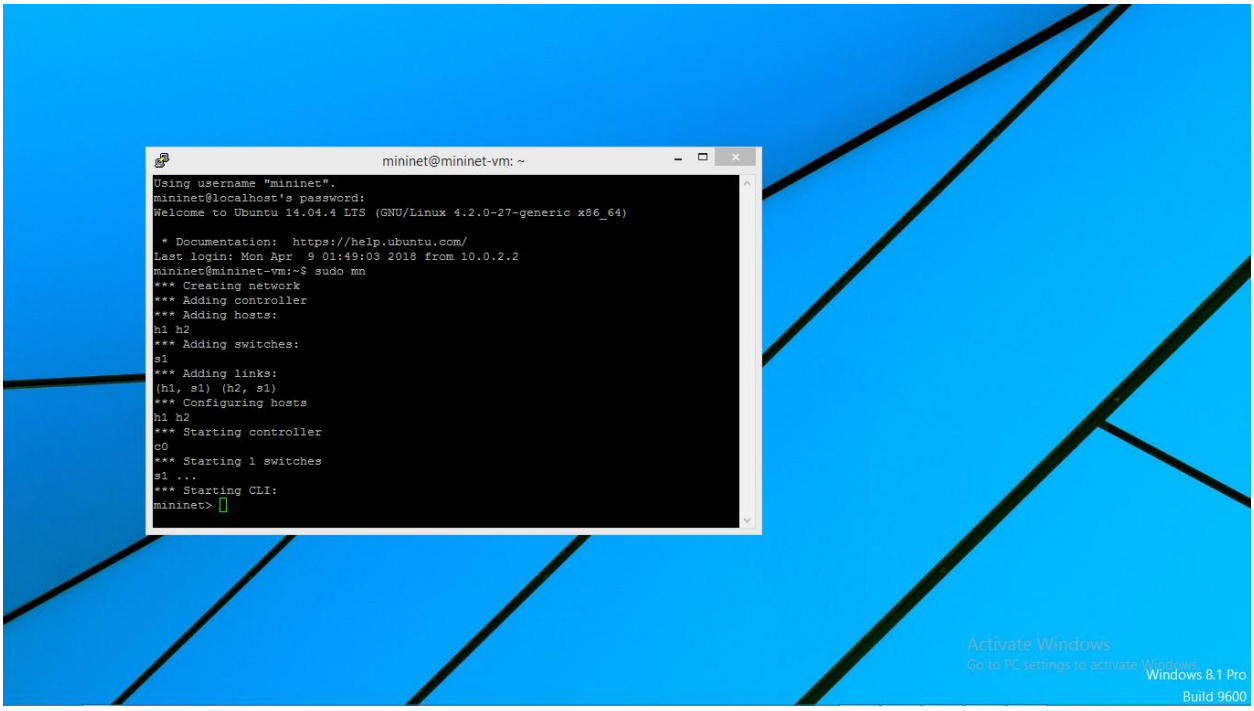
Mininet

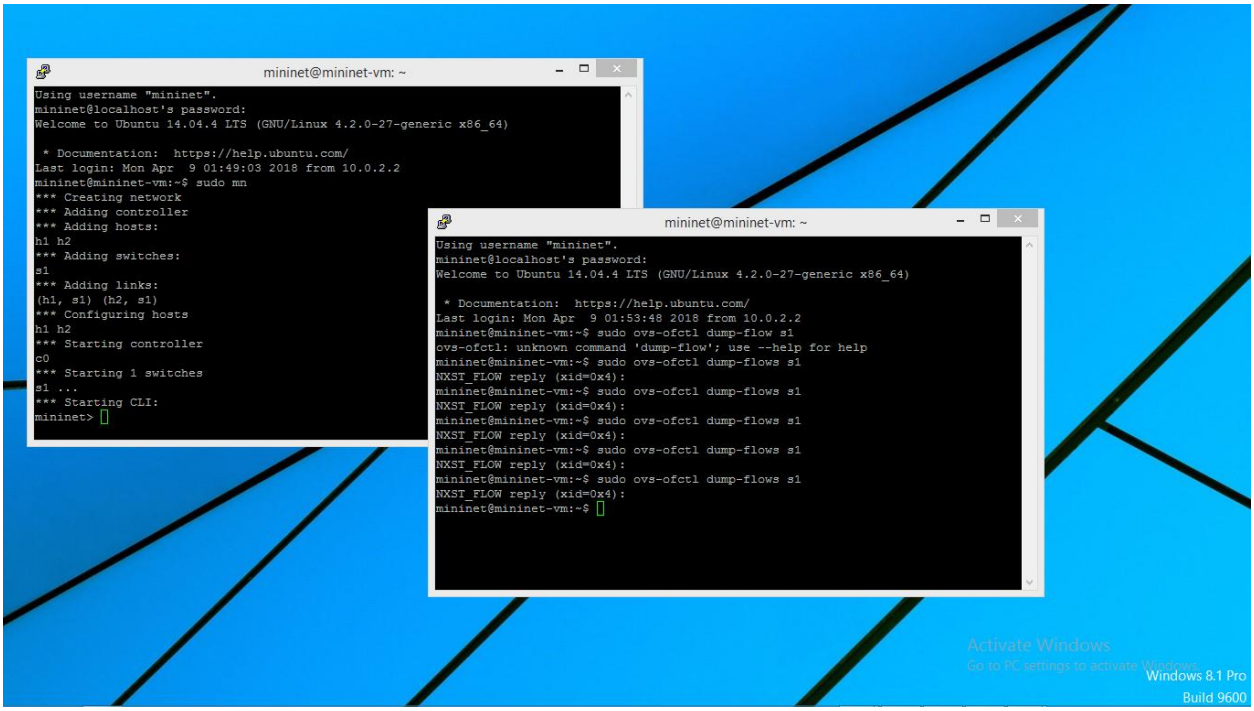
Configure Access



Access via SSH




mininet@mininet-vm: ~
Using username "mininet".
mininet@localhost's password:
Welcome to Ubuntu 14.04.4 LTS (GNU/Linux 4.2.0-27-generic x86_64)
* Documentation: https://help.ubuntu.com/
Last login: Mon Apr 9 01:49:03 2018 from 10.0.2.2
mininet@mininet-vm:~$ sudo mn
*** Creating network
*** Adding controller
*** Adding hosts:
h1 h2
*** Adding switches:
s1
*** Adding links:
(h1, s1) (h2, s1)
*** Configuring hosts
h1 h2
*** Starting controller
c0
*** Starting 1 switches
s1 ...
*** Starting CLI:
mininet>
Activate Windows
Go to PC settings to activate Windows.
Windows 8.1 Pro
Build 9600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*** Configuring hosts
h1 h2
*** Starting controller
c0
*** Starting 1 switches
s1 ...
*** Starting CLI:
mininet>
mininet@mininet-vm: ~
Using username "mininet".
mininet@localhost's password:
Welcome to Ubuntu 14.04.4 LTS (GNU/Linux 4.2.0-27-generic x86_64)
* Documentation: https://help.ubuntu.com/
Last login: Mon Apr 9 01:53:48 2018 from 10.0.2.2
mininet@mininet-vm:~$ sudo ovs-ofctl dump-flow s1
ovs-ofctl: unknown command 'dump-flow'; use --help for help
mininet@mininet-vm:~$ sudo ovs-ofctl dump-flows s1
NXST_FLOW reply (xid=0x4):
mininet@mininet-vm:~$ sudo ovs-ofctl dump-flows s1
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mininet@mininet-vm:~$ sudo ovs-ofctl dump-flows s1
NXST_FLOW reply (xid=0x4):
mininet@mininet-vm:~$
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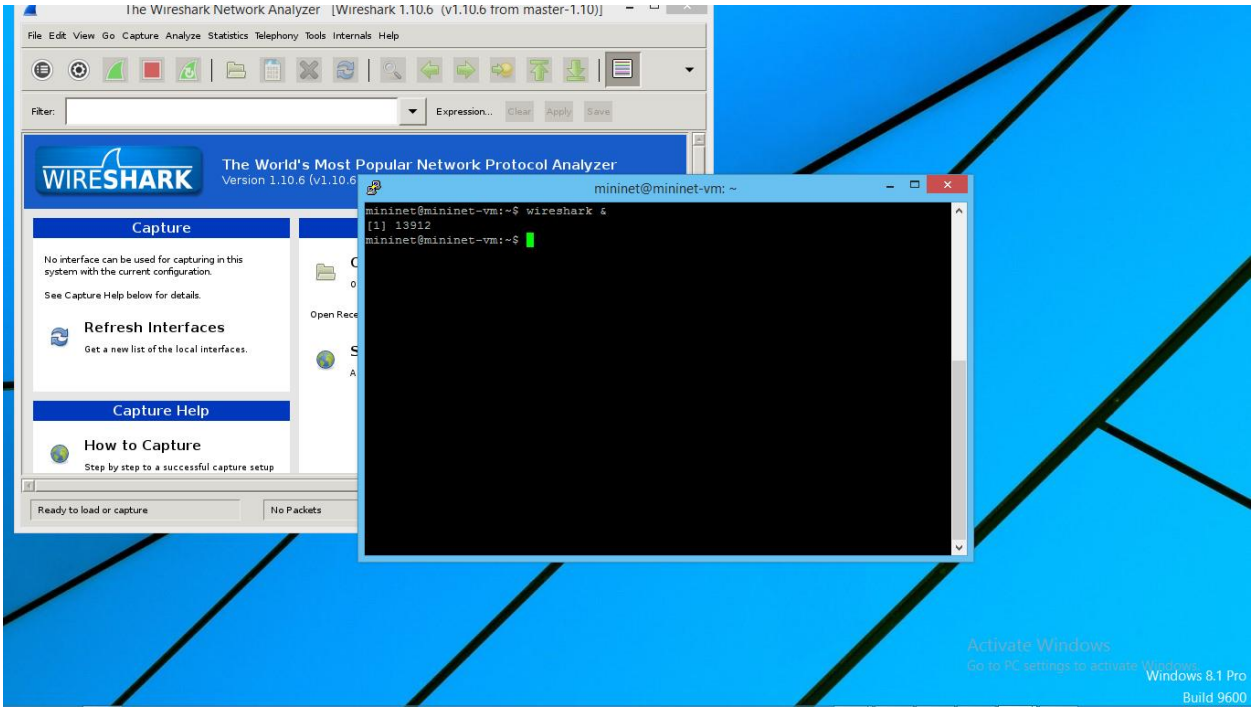
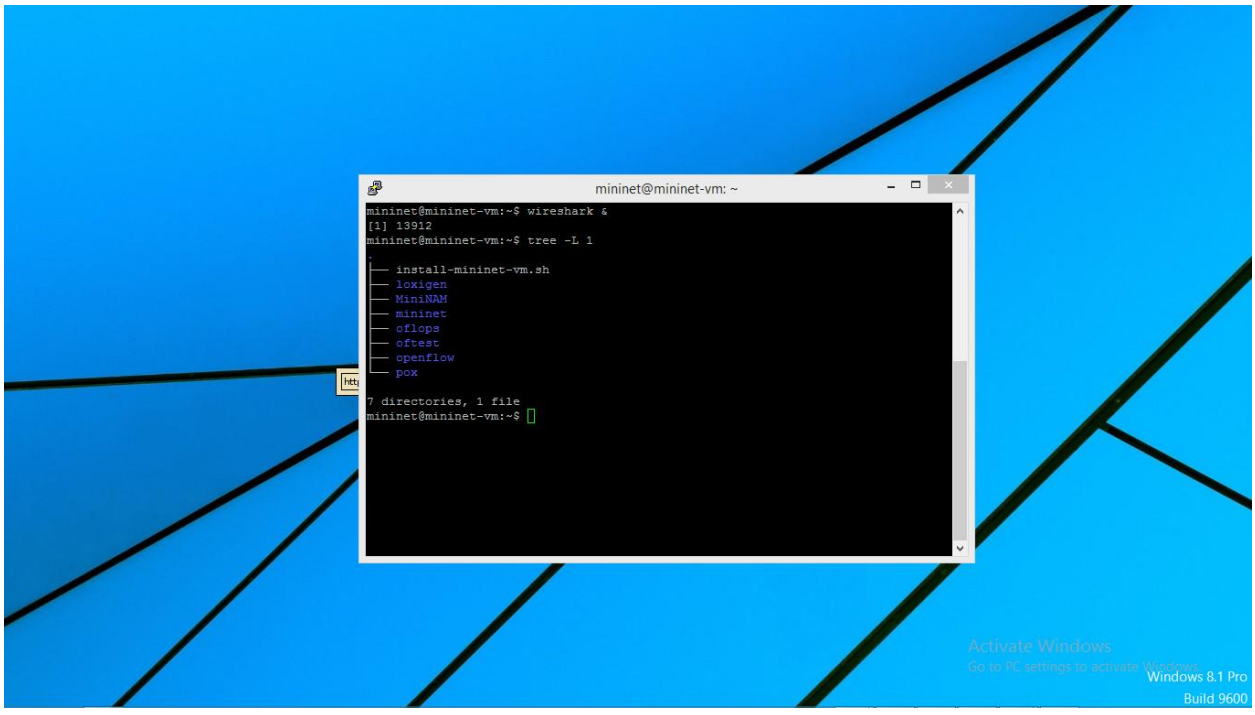
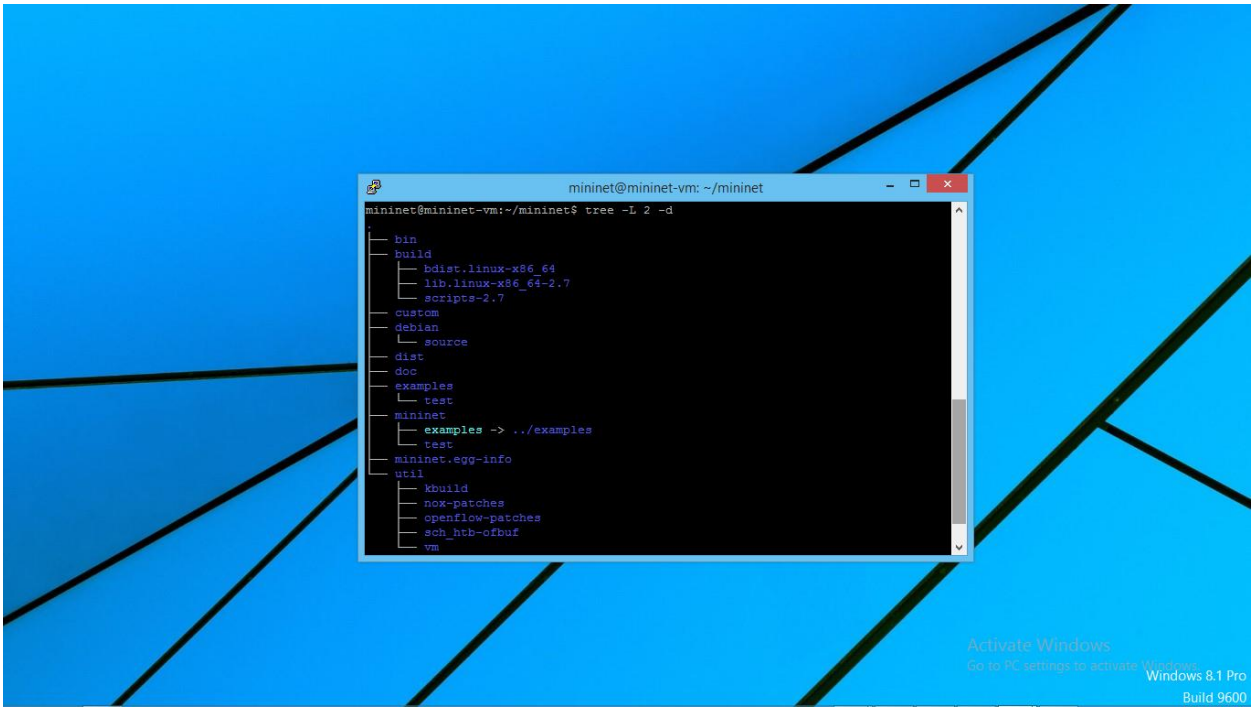
Test Wireshark



Check




mininet@mininet-vm: ~/mininet
mininet@mininet-vm:~/mininet$ tree -L 2 -d
.
├── bin
├── build
│   ├── bdist.linux-x86_64
│   ├── lib.linux-x86_64-2.7
│   └── scripts-2.7
├── custom
├── debian
│   └── source
├── dist
├── doc
├── examples
│   └── test
├── mininet
│   ├── examples -> ../examples
│   └── test
├── mininet.egg-info
└── util
    ├── kbuild
    ├── nox-patches
    ├── openflow-patches
    ├── sch_htb-ofbuf
    └── vm
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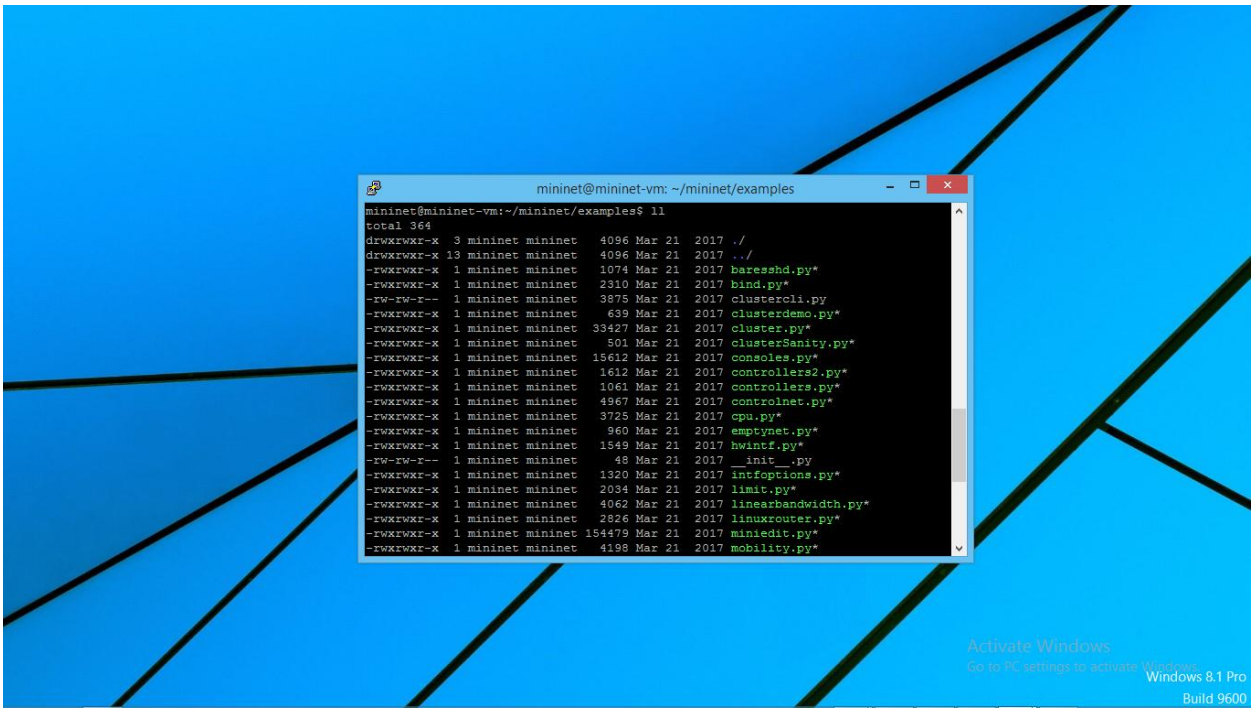
Build 9600


mininet@mininet-vm: ~/mininet/examples
mininet@mininet-vm:~/mininet/examples$ ll
total 364
drwxrwxr-x 3 mininet mininet   4096 Mar 21 2017 ./
drwxrwxr-x 13 mininet mininet   4096 Mar 21 2017 ../
-rwxrwxr-x 1 mininet mininet   1074 Mar 21 2017 baresshd.py*
-rwxrwxr-x 1 mininet mininet   2310 Mar 21 2017 bind.py*
-rw-rw-r-- 1 mininet mininet   3875 Mar 21 2017 clustercli.py
-rwxrwxr-x 1 mininet mininet   639 Mar 21 2017 clusterdemo.py*
-rwxrwxr-x 1 mininet mininet 33427 Mar 21 2017 cluster.py*
-rwxrwxr-x 1 mininet mininet   501 Mar 21 2017 clusterSanity.py*
-rwxrwxr-x 1 mininet mininet 15612 Mar 21 2017 consoles.py*
-rwxrwxr-x 1 mininet mininet   1612 Mar 21 2017 controllers2.py*
-rwxrwxr-x 1 mininet mininet   1061 Mar 21 2017 controllers.py*
-rwxrwxr-x 1 mininet mininet   4967 Mar 21 2017 controlnet.py*
-rwxrwxr-x 1 mininet mininet   3725 Mar 21 2017 cpu.py*
-rwxrwxr-x 1 mininet mininet   960 Mar 21 2017 emptynet.py*
-rwxrwxr-x 1 mininet mininet   1549 Mar 21 2017 hwintf.py*
-rw-rw-r-- 1 mininet mininet   48 Mar 21 2017 __init__.py
-rwxrwxr-x 1 mininet mininet   1320 Mar 21 2017 intfoptions.py*
-rwxrwxr-x 1 mininet mininet   2034 Mar 21 2017 limit.py*
-rwxrwxr-x 1 mininet mininet   4062 Mar 21 2017 linearbandwidth.py*
-rwxrwxr-x 1 mininet mininet   2826 Mar 21 2017 linuxrouter.py*
-rwxrwxr-x 1 mininet mininet 154479 Mar 21 2017 miniedit.py*
-rwxrwxr-x 1 mininet mininet   4198 Mar 21 2017 mobility.py*
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Go to PC settings to activate Windows.
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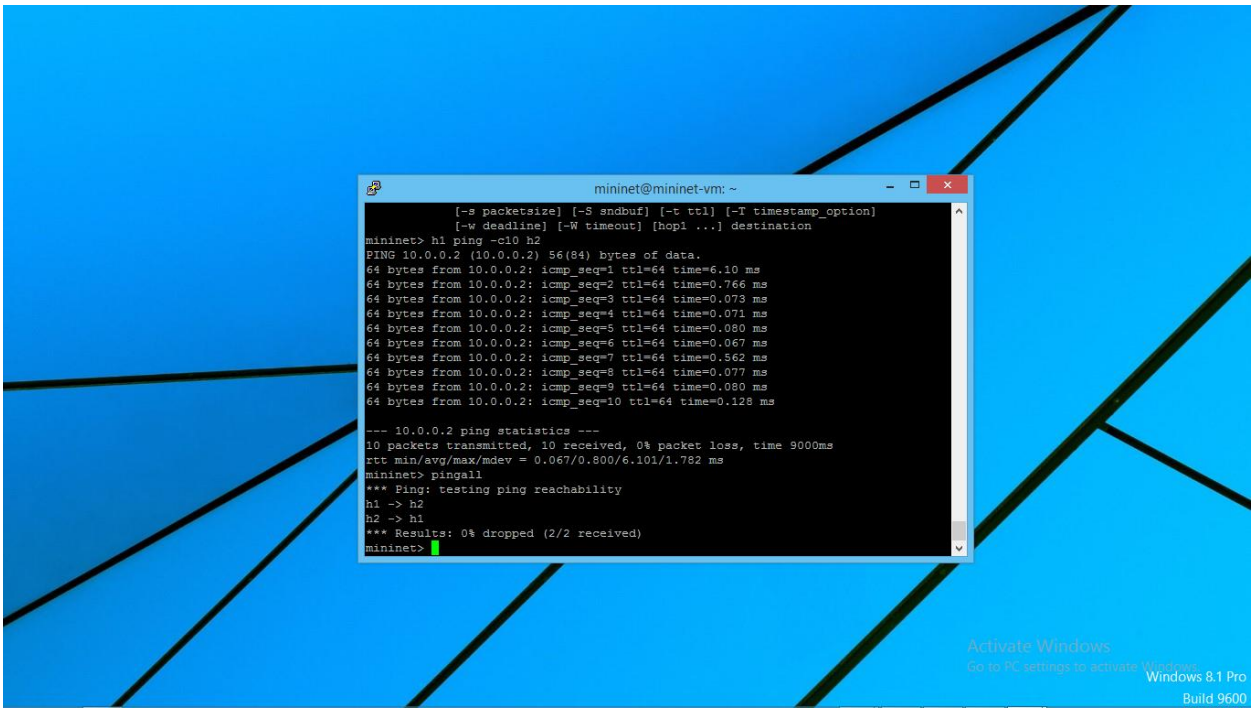
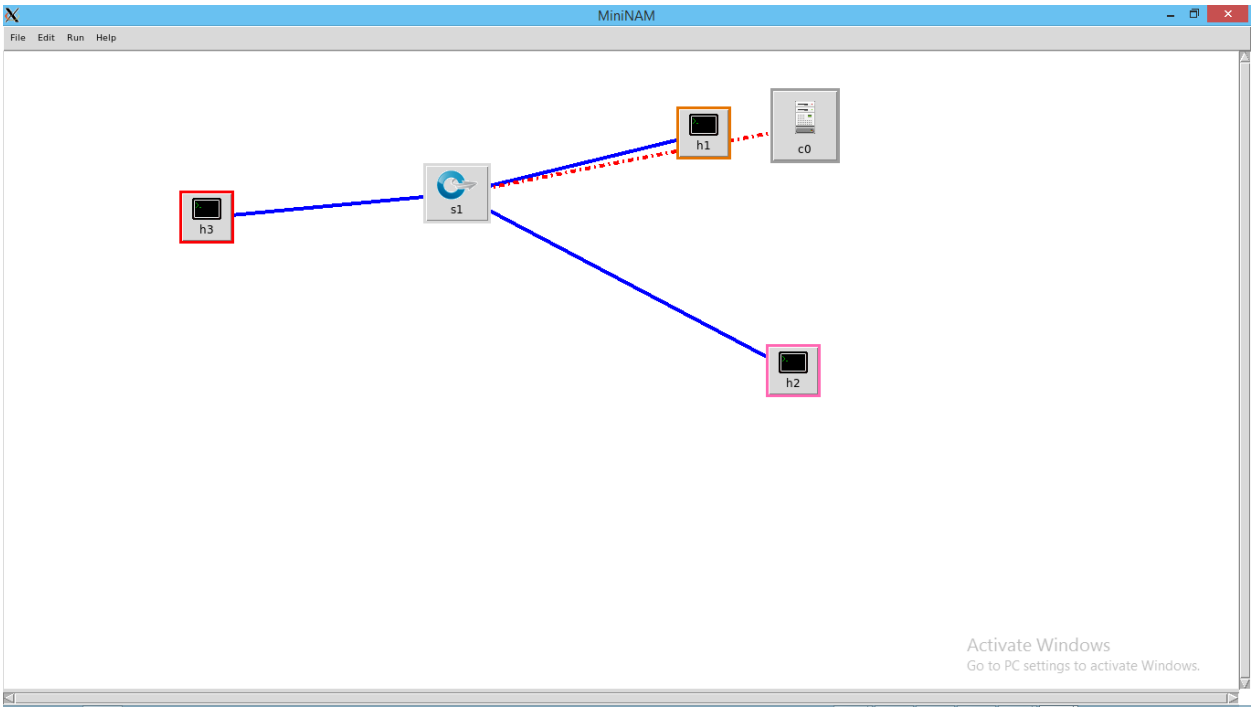
Notes – Mininet Walkthrough



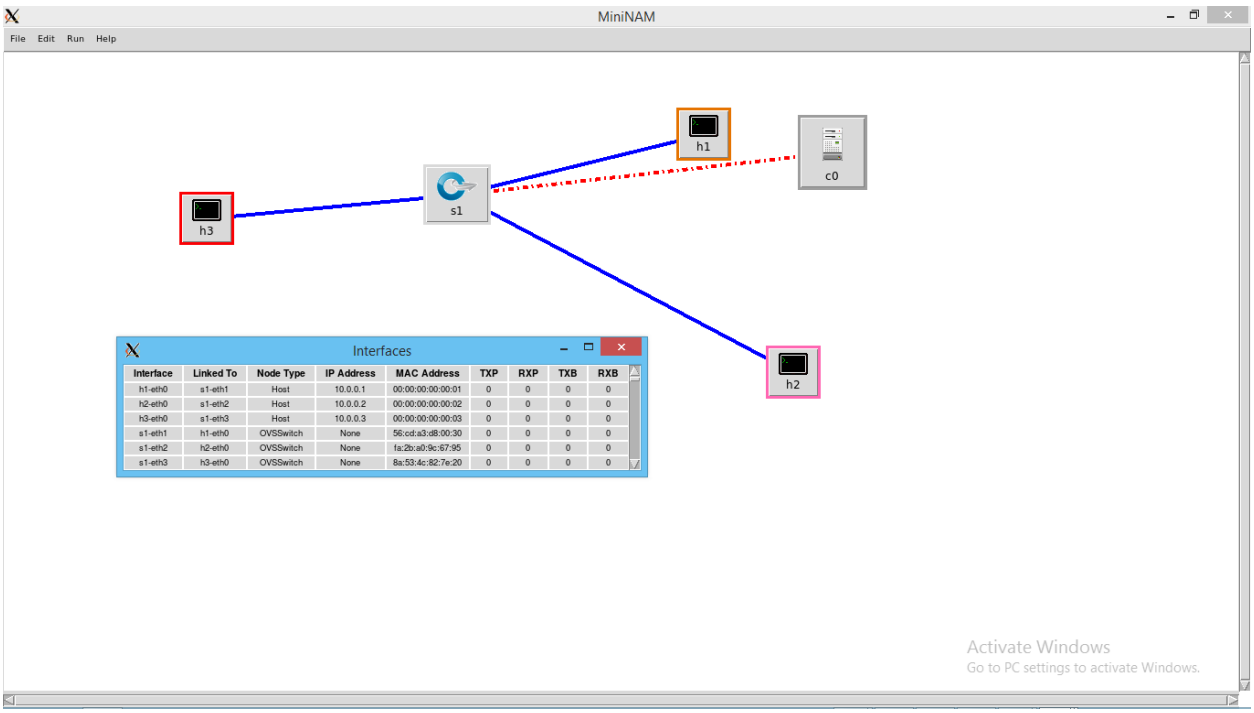
MiniNAM

Setup

mininet@mininet-vm: ~/MiniNAM$ sudo python MiniNAM.py

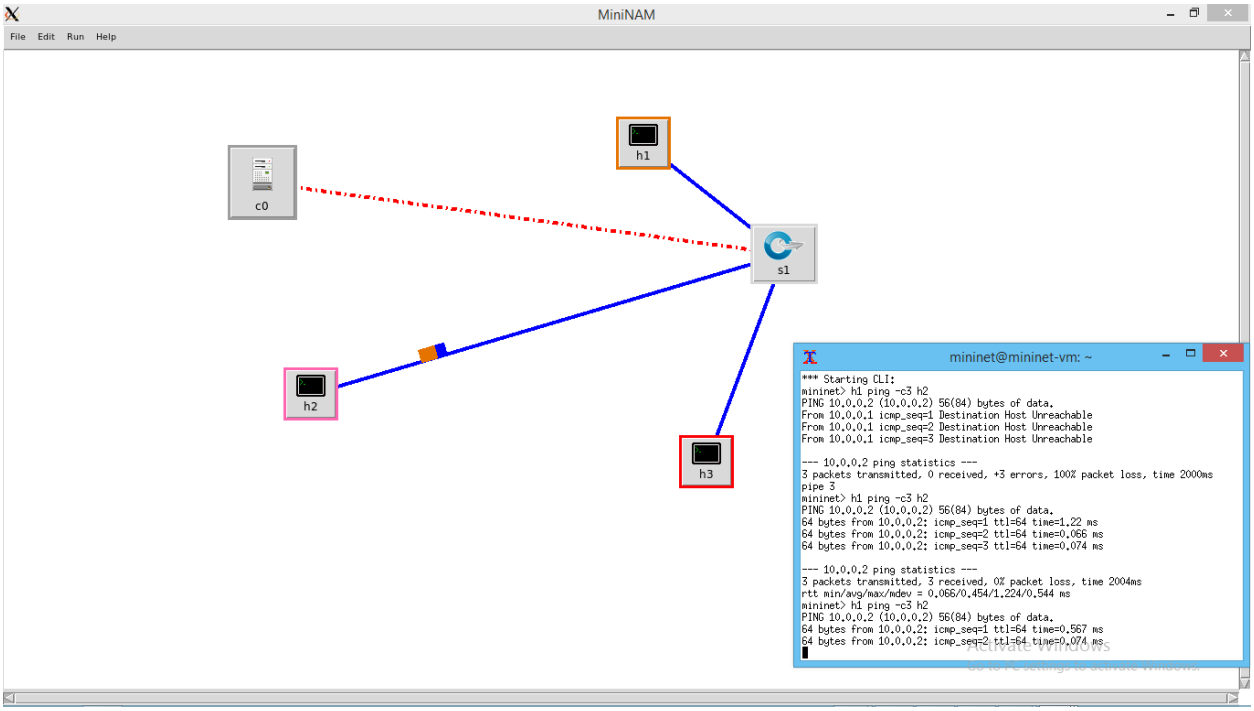


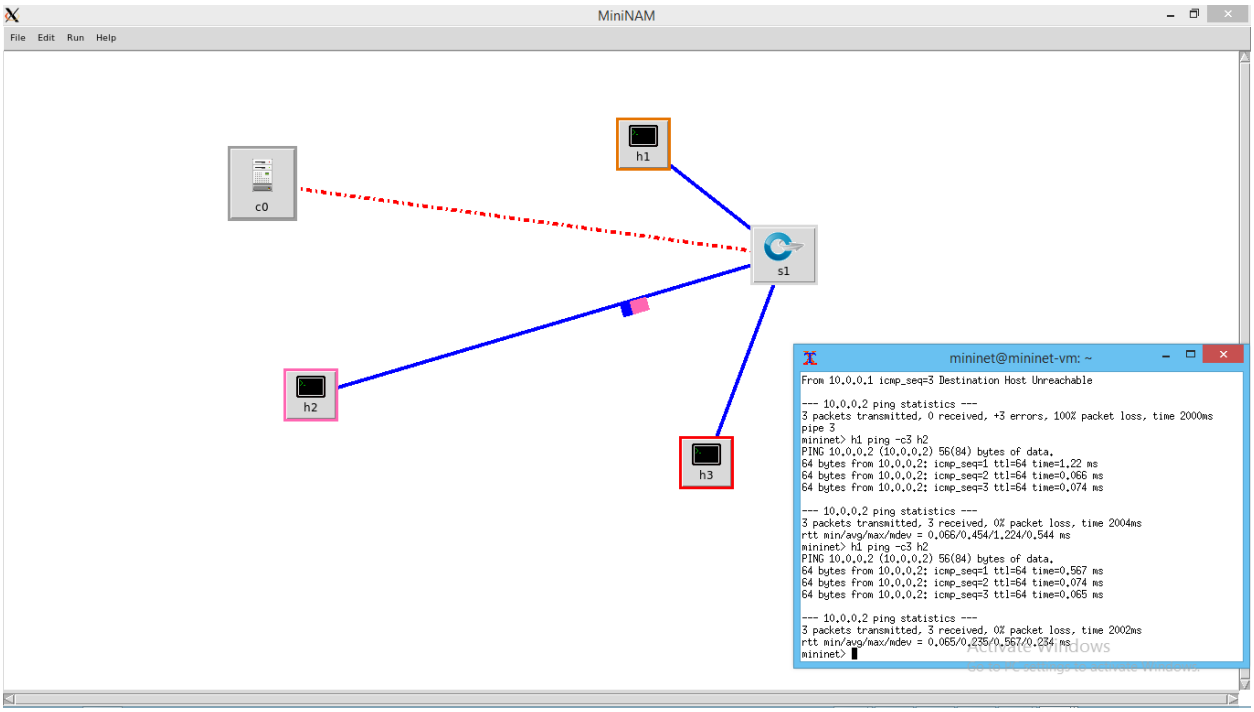
h1 ping –c2 h2



OpenFlow

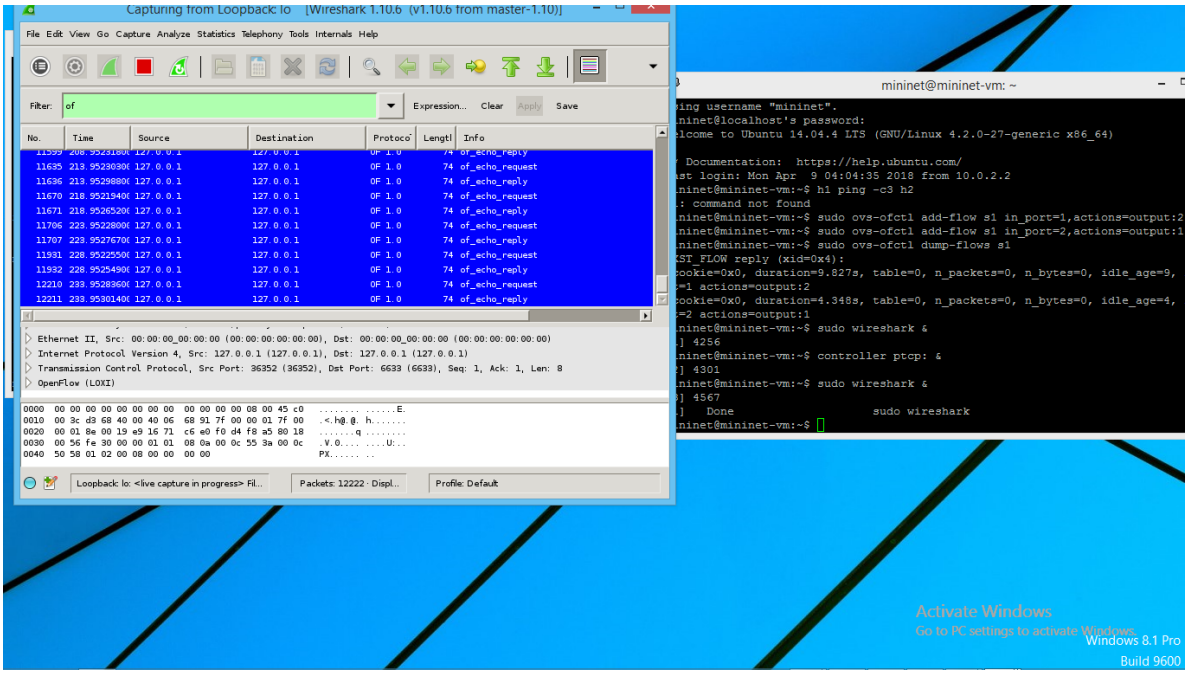
Manual Flow Entry



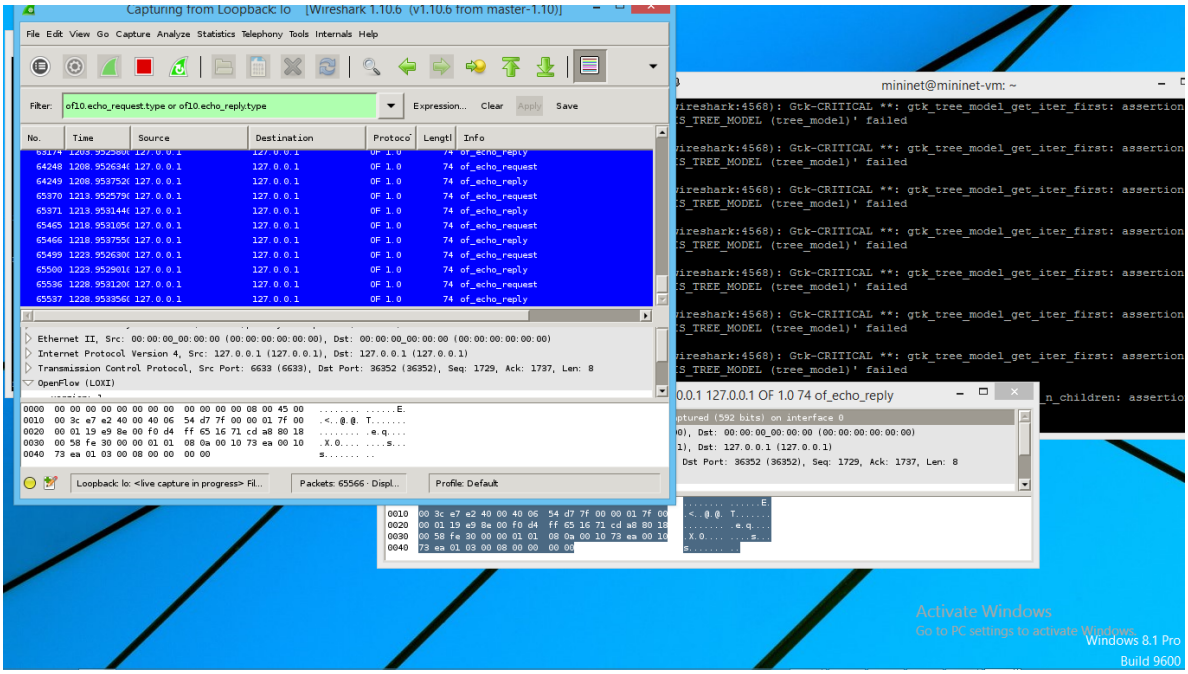


Starting Controller – OF Reference Controller at wireshark

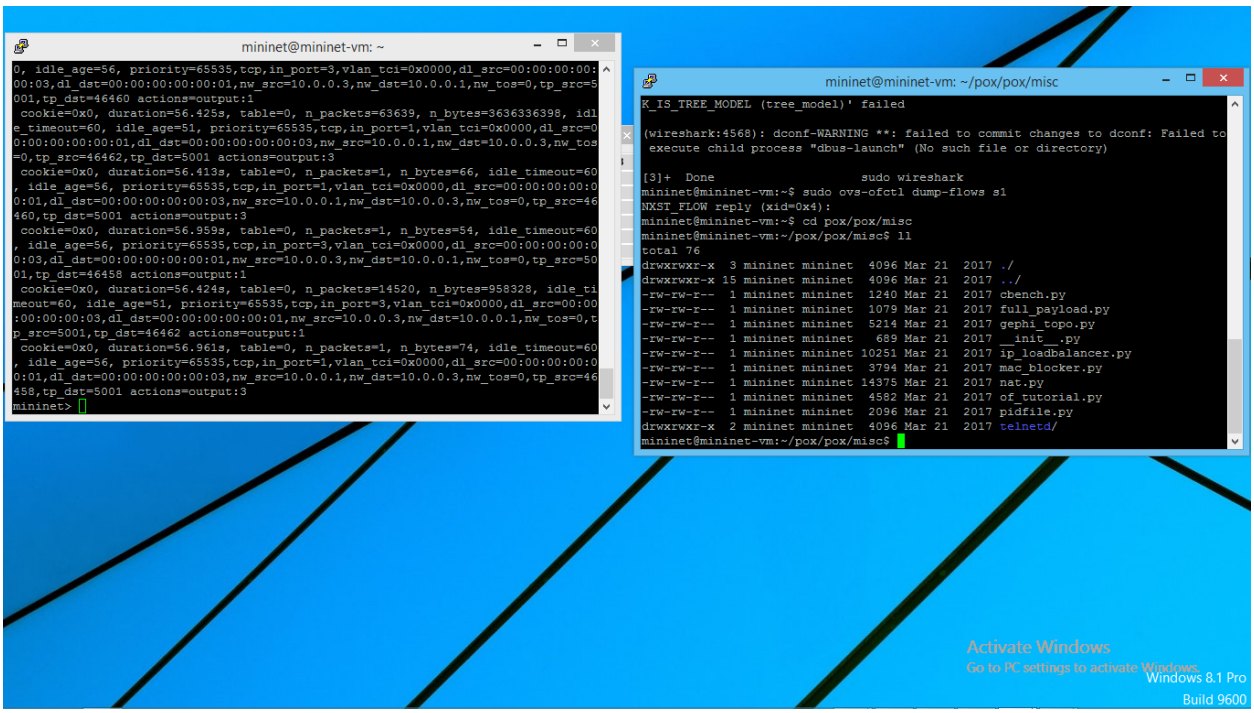
Filter - of



Of and not (of10.echo_request.type or of10.echo_reply.type)

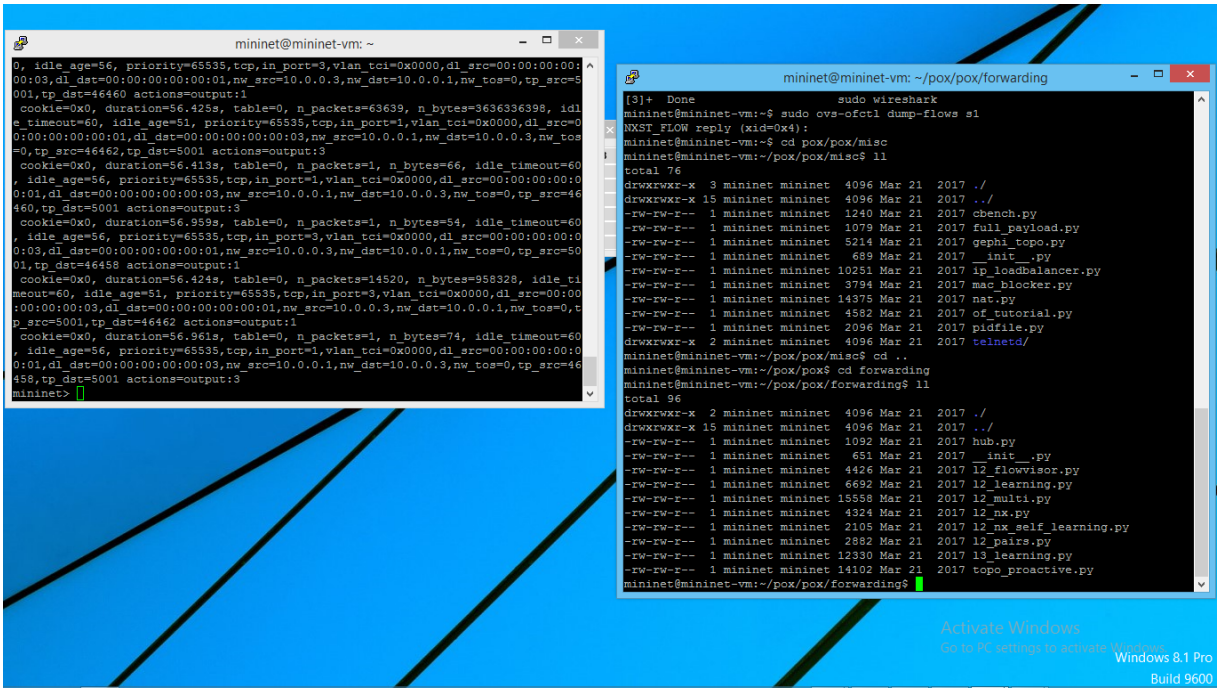


Flow Entries

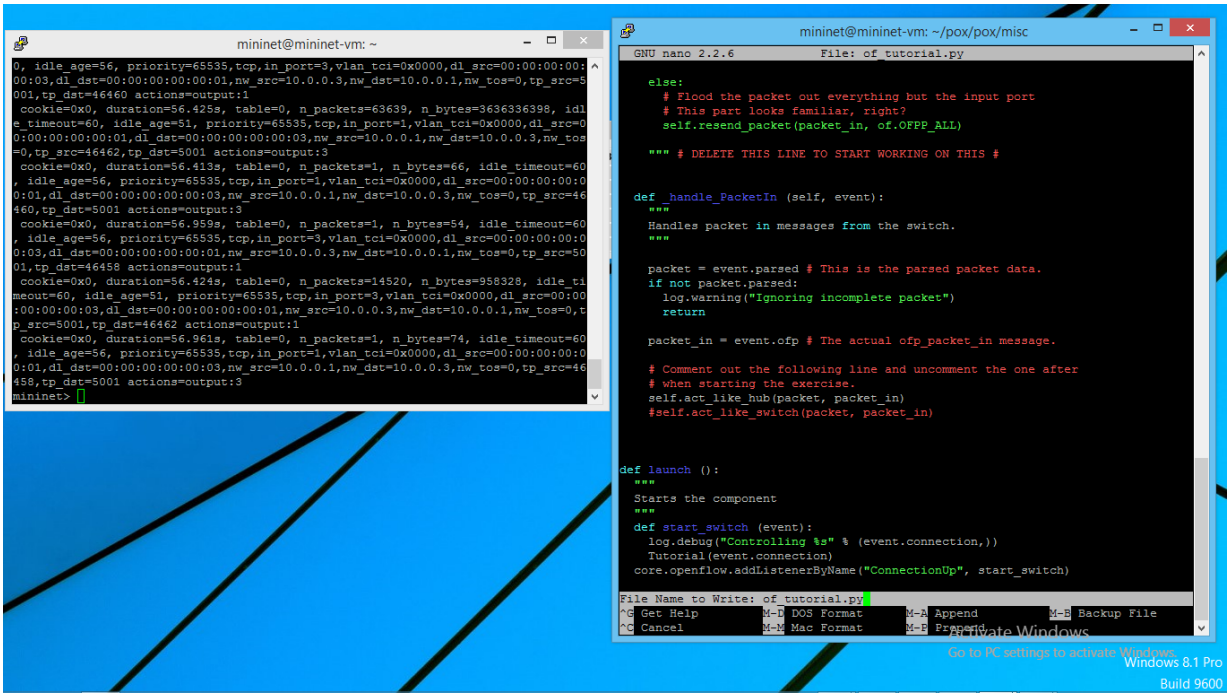


POX Controller

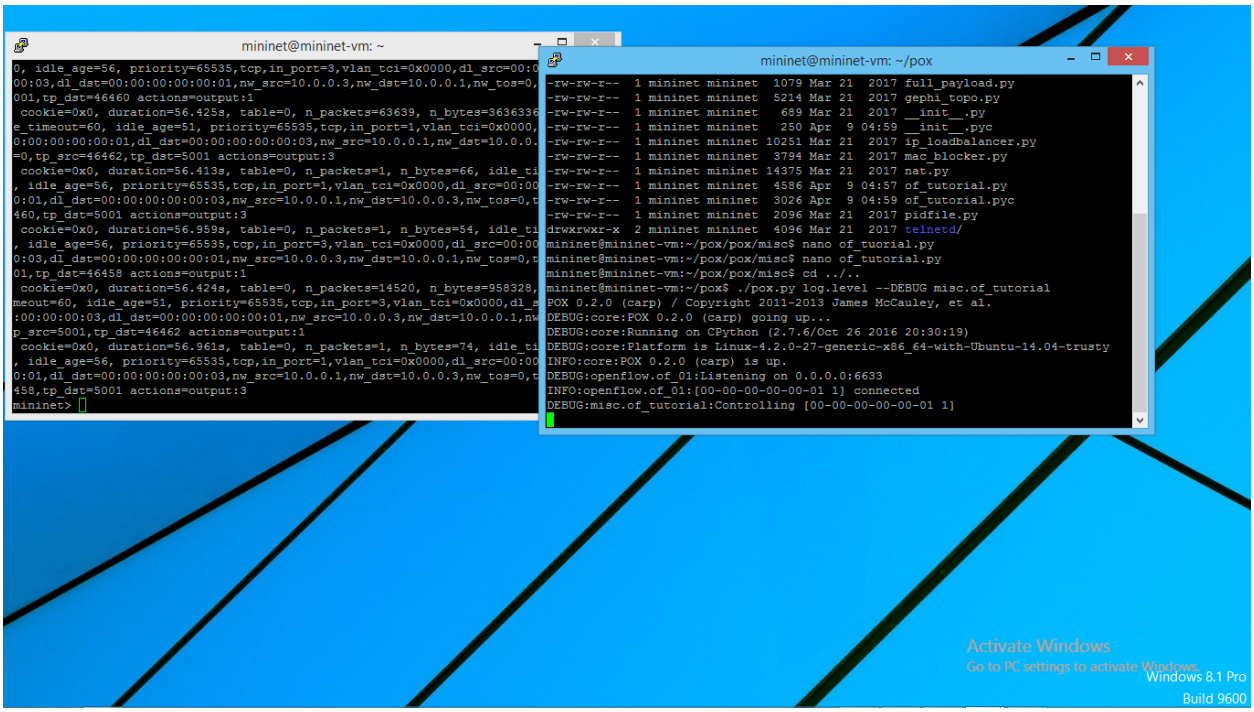
Files

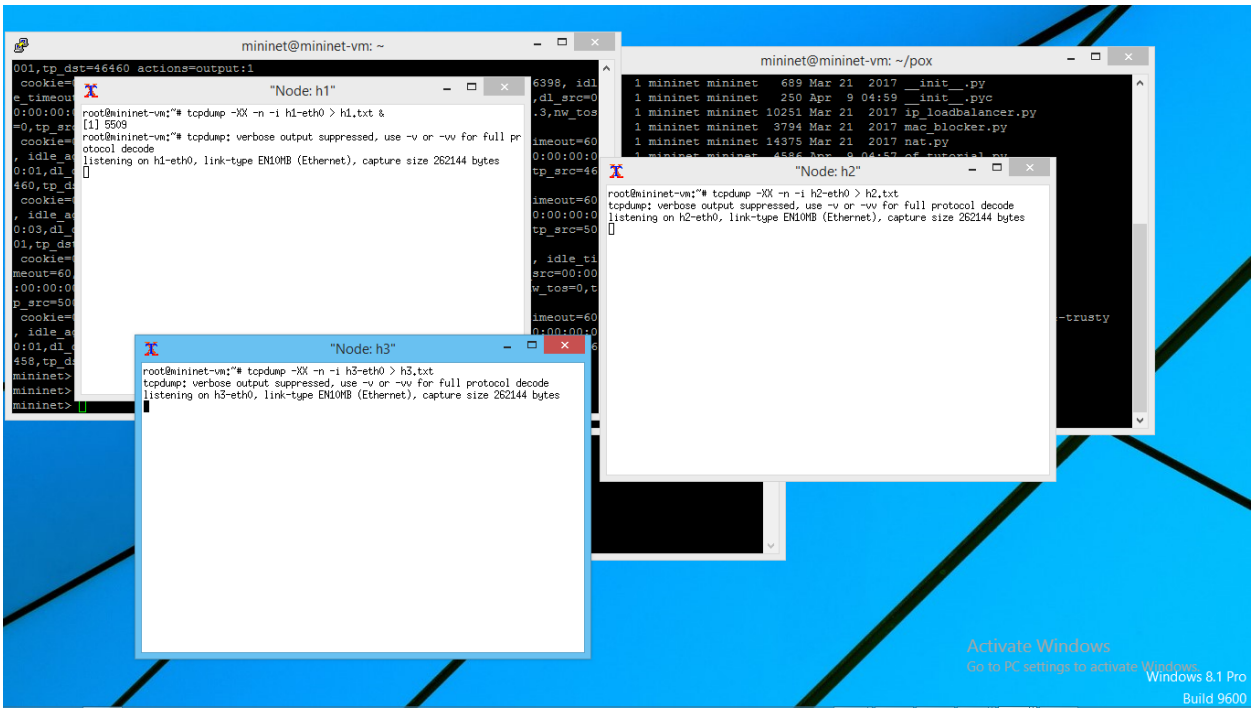


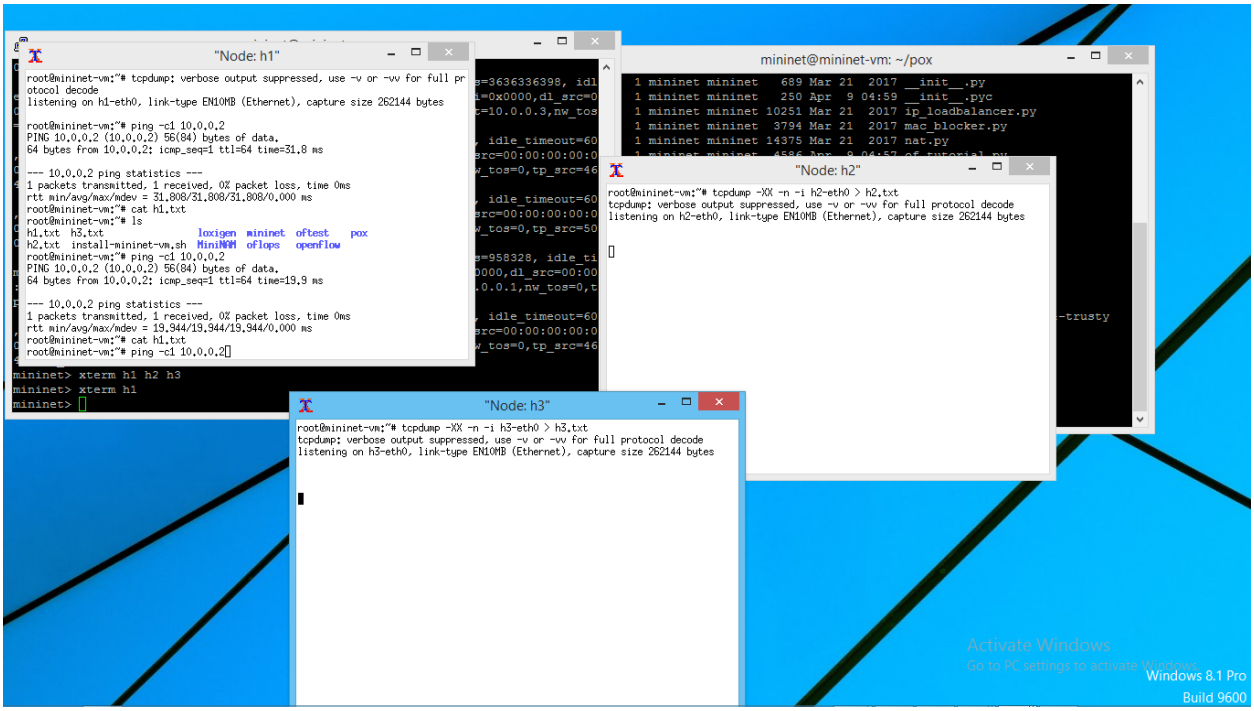
mininet@mininet-vm:~/pox/pox/misc nano of_tutorial.py



Hub Behavior

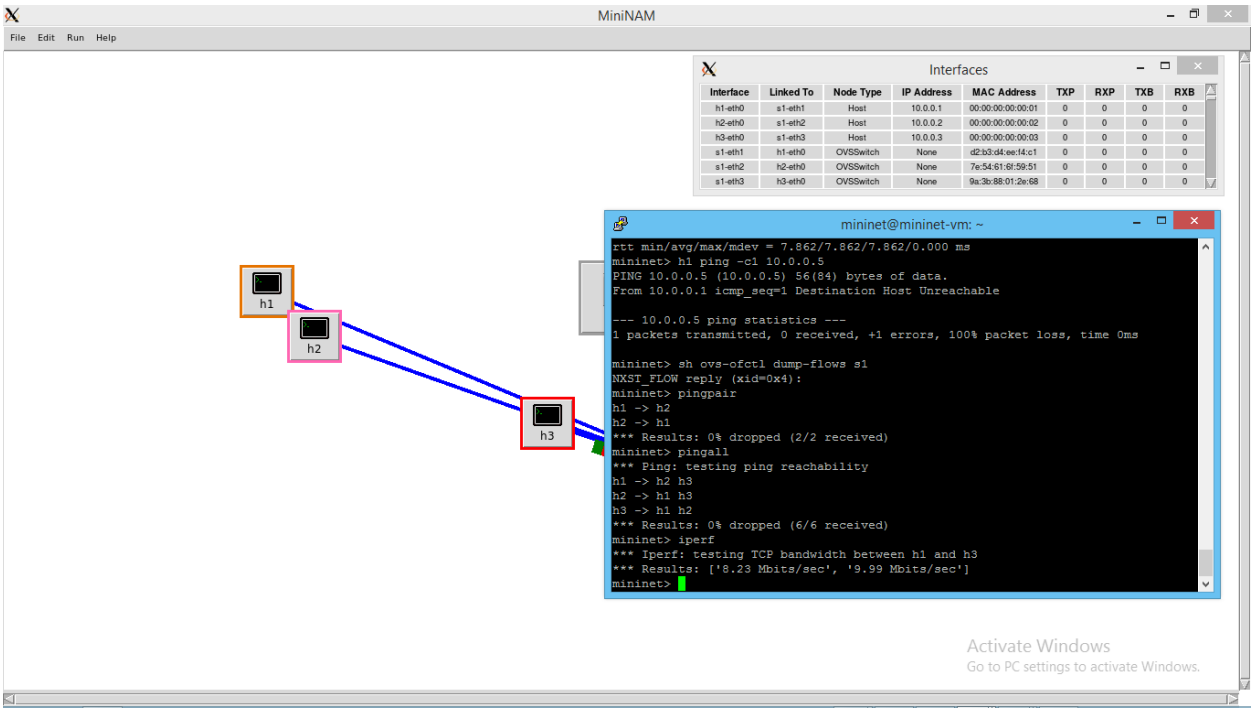






"Node: h1"

```
        0x0060:  3637                                           67
05:12:33.620804 IP 10.0.0.2 > 10.0.0.1: ICMP echo reply, id 5538, seq 1, length
64
        0x0000:  0000 0000 0001 0000 0000 0002 0800 4500  ..............E.
        0x0010:  0054 6c48 0000 4001 fa5e 0a00 0002 0a00  .TlH..@..^......
        0x0020:  0001 0000 e1d9 15a2 0001 b158 cb5a 0000  ...........X.Z..
        0x0030:  0000 c4fc 0800 0000 0000 1011 1213 1415  ................
        0x0040:  1617 1819 1a1b 1c1d 1e1f 2021 2223 2425  .............!"#$%
        0x0050:  2627 2829 2a2b 2c2d 2e2f 3031 3233 3435  &'()*+,-./012345
        0x0060:  3637                                           67
05:12:38.600675 ARP, Request who-has 10.0.0.2 tell 10.0.0.1, length 28
        0x0000:  0000 0000 0002 0000 0000 0001 0806 0001  ................
        0x0010:  0800 0604 0001 0000 0000 0001 0a00 0001  ................
        0x0020:  0000 0000 0000 0a00 0002                 ..........
05:12:38.614031 ARP, Reply 10.0.0.2 is-at 00:00:00:00:00:02, length 28
        0x0000:  0000 0000 0001 0000 0000 0002 0806 0001  ................
        0x0010:  0800 0604 0002 0000 0000 0002 0a00 0002  ................
        0x0020:  0000 0000 0001 0a00 0001                 ..........
05:15:26.550211 IP 10.0.0.1 > 10.0.0.2: ICMP echo request, id 5582, seq 1, lengt
h 64
        0x0000:  0000 0000 0002 0000 0000 0001 0800 4500  ..............E.
        0x0010:  0054 b779 4000 4001 6f2d 0a00 0001 0a00  .T.y@.@.o-......
        0x0020:  0002 0800 c544 15ce 0001 5e59 cb5a 0000  .....D....^Y.Z..
        0x0030:  0000 2c65 0800 0000 0000 1011 1213 1415  ..,e............
        0x0040:  1617 1819 1a1b 1c1d 1e1f 2021 2223 2425  .............!"#$%
        0x0050:  2627 2829 2a2b 2c2d 2e2f 3031 3233 3435  &'()*+,-./012345
        0x0060:  3637                                           67
05:15:26.570132 IP 10.0.0.2 > 10.0.0.1: ICMP echo reply, id 5582, seq 1, length
64
        0x0000:  0000 0000 0001 0000 0000 0002 0800 4500  ..............E.
        0x0010:  0054 bff5 0000 4001 a6b1 0a00 0002 0a00  .T....@.........
        0x0020:  0001 0000 cd44 15ce 0001 5e59 cb5a 0000  .....D....^Y.Z..
        0x0030:  0000 2c65 0800 0000 0000 1011 1213 1415  ..,e............
        0x0040:  1617 1819 1a1b 1c1d 1e1f 2021 2223 2425  .............!"#$%
        0x0050:  2627 2829 2a2b 2c2d 2e2f 3031 3233 3435  &'()*+,-./012345
        0x0060:  3637                                           67
05:15:31.560660 ARP, Request who-has 10.0.0.2 tell 10.0.0.1, length 28
        0x0000:  0000 0000 0002 0000 0000 0001 0806 0001  ................
        0x0010:  0800 0604 0001 0000 0000 0001 0a00 0001  ................
        0x0020:  0000 0000 0000 0a00 0002                 ..........
05:15:31.612273 ARP, Request who-has 10.0.0.1 tell 10.0.0.2, length 28
        0x0000:  0000 0000 0001 0000 0000 0002 0806 0001  ................
        0x0010:  0800 0604 0001 0000 0000 0002 0a00 0002  ................
        0x0020:  0000 0000 0000 0a00 0001                 ..........
05:15:31.612298 ARP, Reply 10.0.0.1 is-at 00:00:00:00:00:01, length 28
        0x0000:  0000 0000 0002 0000 0000 0001 0806 0001  ................
        0x0010:  0800 0604 0002 0000 0000 0001 0a00 0001  ................
        0x0020:  0000 0000 0002 0a00 0002                 ..........
05:15:31.614041 ARP, Reply 10.0.0.2 is-at 00:00:00:00:00:02, length 28
        0x0000:  0000 0000 0001 0000 0000 0002 0806 0001  ................
        0x0010:  0800 0604 0002 0000 0000 0002 0a00 0002  ................
        0x0020:  0000 0000 0001 0a00 0001                 ..........
05:16:26.724322 ARP, Request who-has 10.0.0.5 tell 10.0.0.1, length 28
        0x0000:  ffff ffff ffff 0000 0000 0001 0806 0001  ................
        0x0010:  0800 0604 0001 0000 0000 0001 0a00 0001  ................
        0x0020:  0000 0000 0000 0a00 0005                 ..........
05:16:27.720704 ARP, Request root@mininet-vm:~#
```


MiniNAM
File Edit Run Help
Interfaces
Interface Linked To Node Type IP Address MAC Address TXP RXP TXB RXB
h1-eth0 s1-eth1 Host 10.0.0.1 00:00:00:00:00:01 0 0 0 0
h2-eth0 s1-eth2 Host 10.0.0.2 00:00:00:00:00:02 0 0 0 0
h3-eth0 s1-eth3 Host 10.0.0.3 00:00:00:00:00:03 0 0 0 0
s1-eth1 h1-eth0 OVSSwitch None d2:b3:d4:ee:f4:c1 0 0 0 0
s1-eth2 h2-eth0 OVSSwitch None 7e:54:61:6f:59:51 0 0 0 0
s1-eth3 h3-eth0 OVSSwitch None 9a:3b:88:01:2e:68 0 0 0 0
h1
h2
h3
mininet@mininet-vm: ~
rtt min/avg/max/mdev = 7.862/7.862/7.862/0.000 ms
mininet> h1 ping -c1 10.0.0.5
PING 10.0.0.5 (10.0.0.5) 56(84) bytes of data.
From 10.0.0.1 icmp_seq=1 Destination Host Unreachable
--- 10.0.0.5 ping statistics ---
1 packets transmitted, 0 received, +1 errors, 100% packet loss, time 0ms
mininet> sh ovs-ofctl dump-flows s1
NXST_FLOW reply (xid=0x4):
mininet> pingpair
h1 -> h2
h2 -> h1
*** Results: 0% dropped (2/2 received)
mininet> pingall
*** Ping: testing ping reachability
h1 -> h2 h3
h2 -> h1 h3
h3 -> h1 h2
*** Results: 0% dropped (6/6 received)
mininet> iperf
*** Iperf: testing TCP bandwidth between h1 and h3
*** Results: ['8.23 Mbits/sec', '9.99 Mbits/sec']
mininet>
Activate Windows
Go to PC settings to activate Windows.