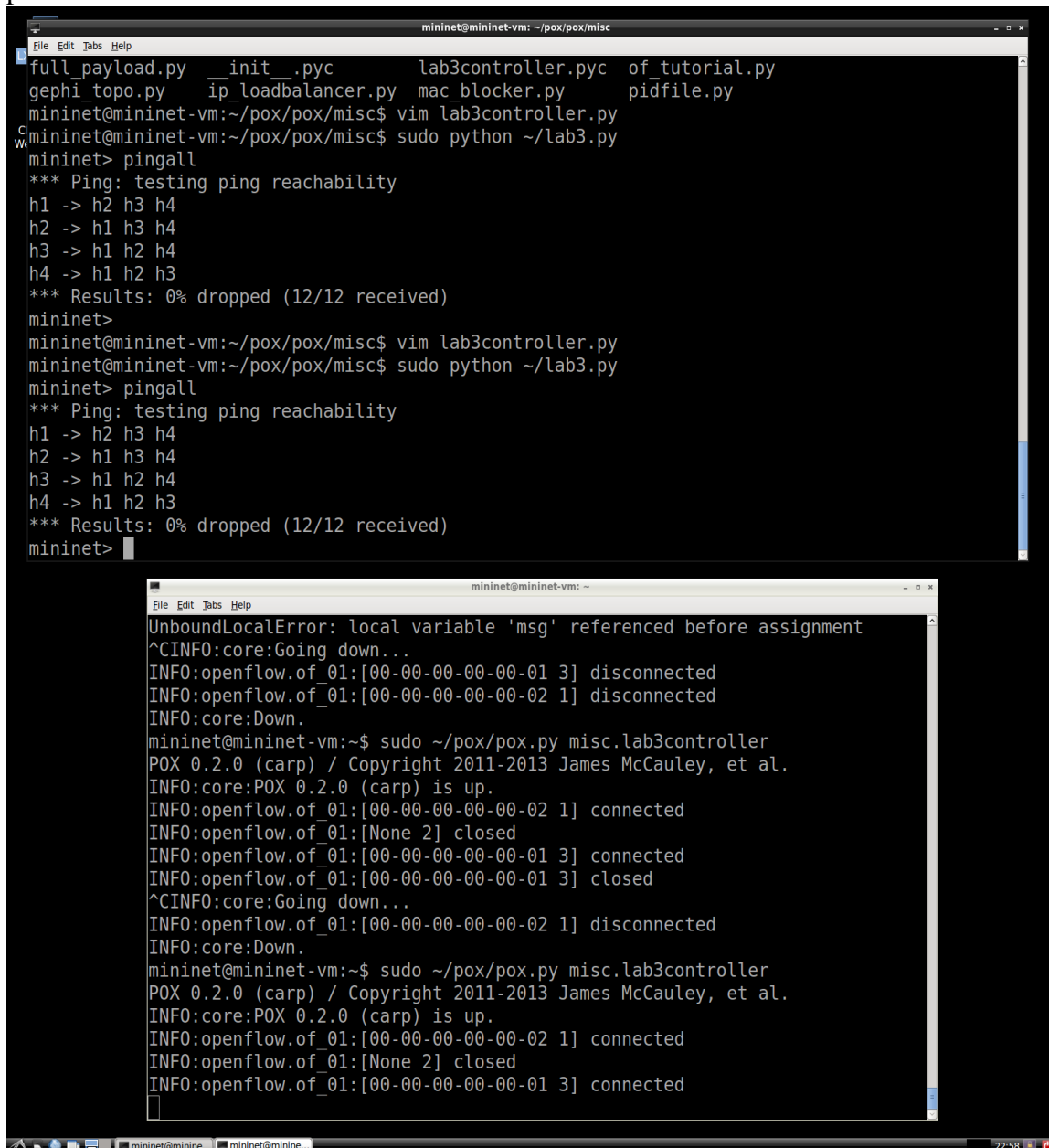


Lab 3

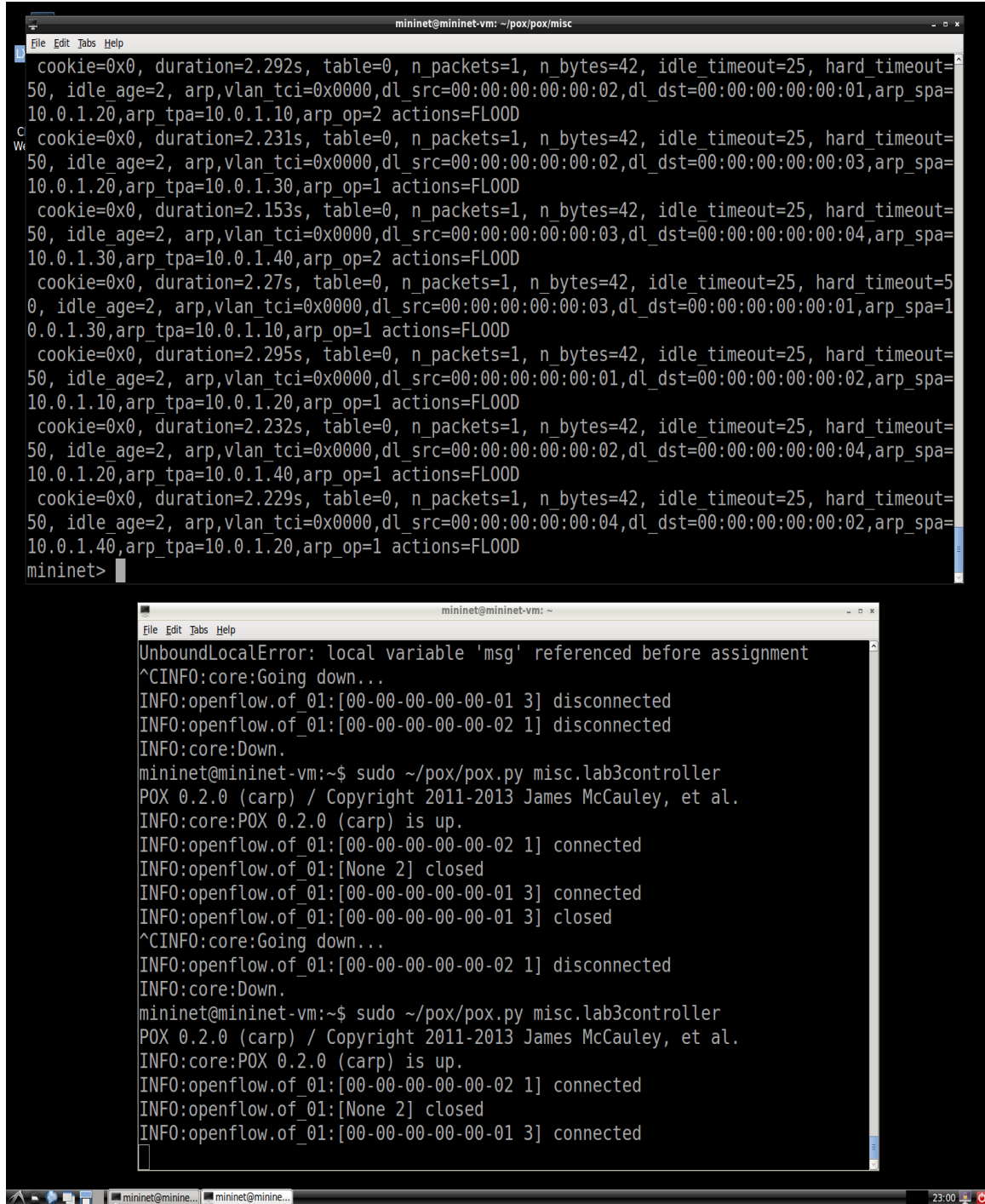
1. pingall: this command is testing the connection between all the different hosts to make sure there is a valid and stable connection between the 4 different hosts, in this case. You will notice below that there were 12 packets sent and 12 packets received, indicating 0% packet loss.



```
mininet@mininet-vm: ~/pox/pox/misc
File Edit Tabs Help
full_payload.py  __init__.pyc  lab3controller.pyc  of_tutorial.py
gephi_topo.py    ip_loadbalancer.py  mac_blocker.py     pidfile.py
mininet@mininet-vm:~/pox/pox/misc$ vim lab3controller.py
mininet@mininet-vm:~/pox/pox/misc$ sudo python ~/lab3.py
mininet> pingall
*** Ping: testing ping reachability
h1 -> h2 h3 h4
h2 -> h1 h3 h4
h3 -> h1 h2 h4
h4 -> h1 h2 h3
*** Results: 0% dropped (12/12 received)
mininet>
mininet@mininet-vm:~/pox/pox/misc$ vim lab3controller.py
mininet@mininet-vm:~/pox/pox/misc$ sudo python ~/lab3.py
mininet> pingall
*** Ping: testing ping reachability
h1 -> h2 h3 h4
h2 -> h1 h3 h4
h3 -> h1 h2 h4
h4 -> h1 h2 h3
*** Results: 0% dropped (12/12 received)
mininet>

mininet@mininet-vm: ~
File Edit Tabs Help
UnboundLocalError: local variable 'msg' referenced before assignment
^CINFO:core:Going down...
INFO:openflow.of_01:[00-00-00-00-00-01 3] disconnected
INFO:openflow.of_01:[00-00-00-00-00-02 1] disconnected
INFO:core:Down.
mininet@mininet-vm:~$ sudo ~/pox/pox.py misc.lab3controller
POX 0.2.0 (carp) / Copyright 2011-2013 James McCauley, et al.
INFO:core:POX 0.2.0 (carp) is up.
INFO:openflow.of_01:[00-00-00-00-00-02 1] connected
INFO:openflow.of_01:[None 2] closed
INFO:openflow.of_01:[00-00-00-00-00-01 3] connected
INFO:openflow.of_01:[00-00-00-00-00-01 3] closed
^CINFO:core:Going down...
INFO:openflow.of_01:[00-00-00-00-00-02 1] disconnected
INFO:core:Down.
mininet@mininet-vm:~$ sudo ~/pox/pox.py misc.lab3controller
POX 0.2.0 (carp) / Copyright 2011-2013 James McCauley, et al.
INFO:core:POX 0.2.0 (carp) is up.
INFO:openflow.of_01:[00-00-00-00-00-02 1] connected
INFO:openflow.of_01:[None 2] closed
INFO:openflow.of_01:[00-00-00-00-00-01 3] connected
```

2. `dpctl dump-flows`: this command returns a couple entries which refer to the rules and matches you've set for the packets. You'll notice in my picture below, that I have quite a few and that is because in my code, I set packet matching and rules for each individual packet, thus why so many entries are returned. You can see below all the conditions set for each packet along with the action, which in this case is FLOODING.

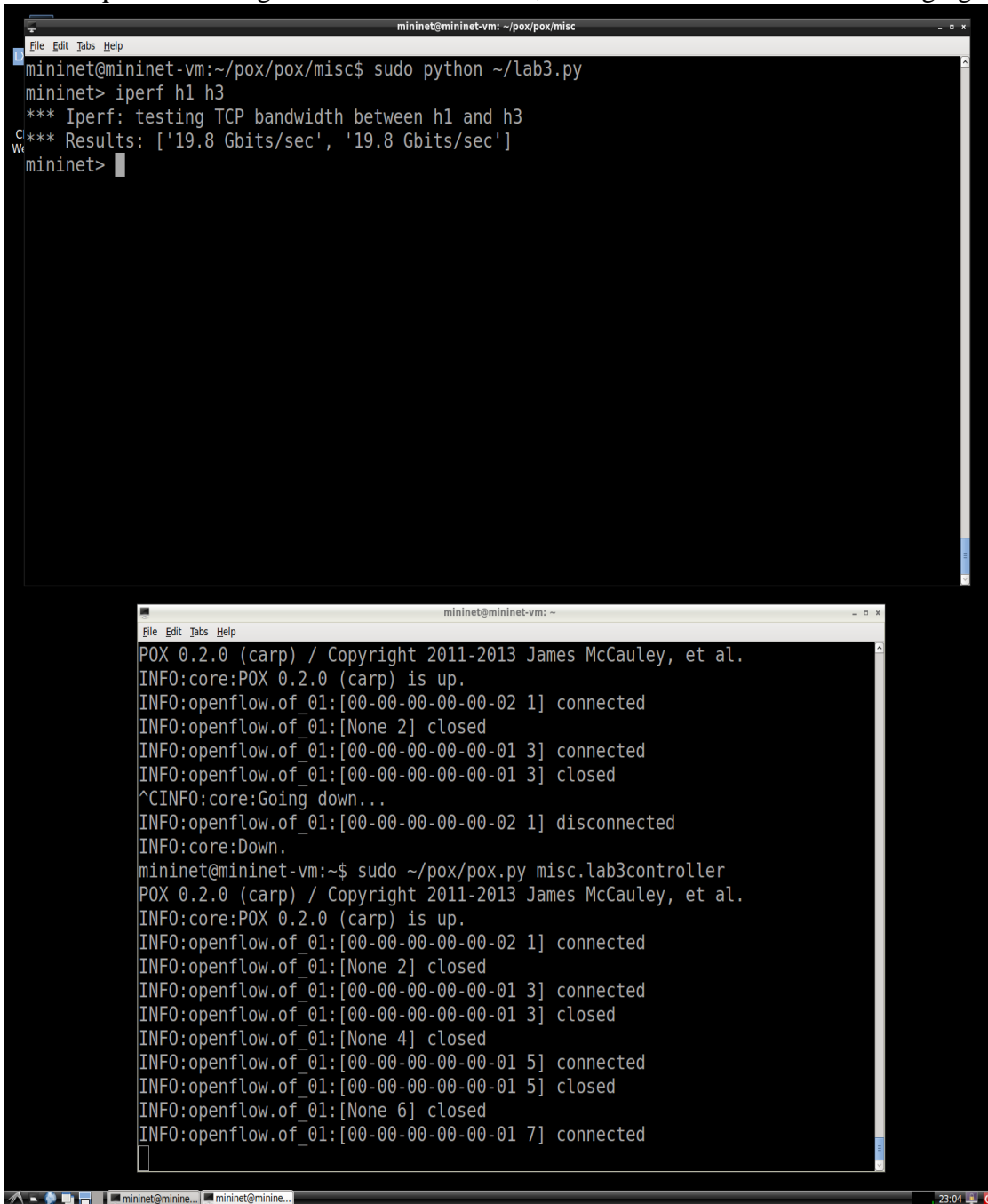


The image contains two terminal screenshots. The top screenshot shows the output of the `dpctl dump-flows` command, displaying multiple flow entries with details like duration, table, packets, bytes, timeouts, and actions (all set to FLOOD). The bottom screenshot shows a series of log messages from a Mininet controller, including connection status updates and error messages like 'UnboundLocalError: local variable 'msg' referenced before assignment'.

```
mininet@mininet-vm: ~/pox/pox/misc
File Edit Tabs Help
cookie=0x0, duration=2.292s, table=0, n_packets=1, n_bytes=42, idle_timeout=25, hard_timeout=50, idle_age=2, arp,vlan_tci=0x0000,d_l_src=00:00:00:00:00:02,d_l_dst=00:00:00:00:00:01,arp_spa=10.0.1.20,arp_tpa=10.0.1.10,arp_op=2 actions=FLOOD
cookie=0x0, duration=2.231s, table=0, n_packets=1, n_bytes=42, idle_timeout=25, hard_timeout=50, idle_age=2, arp,vlan_tci=0x0000,d_l_src=00:00:00:00:00:02,d_l_dst=00:00:00:00:00:03,arp_spa=10.0.1.20,arp_tpa=10.0.1.30,arp_op=1 actions=FLOOD
cookie=0x0, duration=2.153s, table=0, n_packets=1, n_bytes=42, idle_timeout=25, hard_timeout=50, idle_age=2, arp,vlan_tci=0x0000,d_l_src=00:00:00:00:00:03,d_l_dst=00:00:00:00:00:04,arp_spa=10.0.1.30,arp_tpa=10.0.1.40,arp_op=2 actions=FLOOD
cookie=0x0, duration=2.27s, table=0, n_packets=1, n_bytes=42, idle_timeout=25, hard_timeout=50, idle_age=2, arp,vlan_tci=0x0000,d_l_src=00:00:00:00:00:03,d_l_dst=00:00:00:00:00:01,arp_spa=10.0.1.30,arp_tpa=10.0.1.10,arp_op=1 actions=FLOOD
cookie=0x0, duration=2.295s, table=0, n_packets=1, n_bytes=42, idle_timeout=25, hard_timeout=50, idle_age=2, arp,vlan_tci=0x0000,d_l_src=00:00:00:00:00:01,d_l_dst=00:00:00:00:00:02,arp_spa=10.0.1.10,arp_tpa=10.0.1.20,arp_op=1 actions=FLOOD
cookie=0x0, duration=2.232s, table=0, n_packets=1, n_bytes=42, idle_timeout=25, hard_timeout=50, idle_age=2, arp,vlan_tci=0x0000,d_l_src=00:00:00:00:00:02,d_l_dst=00:00:00:00:00:04,arp_spa=10.0.1.20,arp_tpa=10.0.1.40,arp_op=1 actions=FLOOD
cookie=0x0, duration=2.229s, table=0, n_packets=1, n_bytes=42, idle_timeout=25, hard_timeout=50, idle_age=2, arp,vlan_tci=0x0000,d_l_src=00:00:00:00:00:04,d_l_dst=00:00:00:00:00:02,arp_spa=10.0.1.40,arp_tpa=10.0.1.20,arp_op=1 actions=FLOOD
mininet>

mininet@mininet-vm: ~
File Edit Tabs Help
UnboundLocalError: local variable 'msg' referenced before assignment
^CINFO:core:Going down...
INFO:openflow.of_01:[00-00-00-00-00-01 3] disconnected
INFO:openflow.of_01:[00-00-00-00-00-02 1] disconnected
INFO:core:Down.
mininet@mininet-vm:~$ sudo ~/pox/pox.py misc.lab3controller
POX 0.2.0 (carp) / Copyright 2011-2013 James McCauley, et al.
INFO:core:POX 0.2.0 (carp) is up.
INFO:openflow.of_01:[00-00-00-00-00-02 1] connected
INFO:openflow.of_01:[None 2] closed
INFO:openflow.of_01:[00-00-00-00-00-01 3] connected
INFO:openflow.of_01:[00-00-00-00-00-01 3] closed
^CINFO:core:Going down...
INFO:openflow.of_01:[00-00-00-00-00-02 1] disconnected
INFO:core:Down.
mininet@mininet-vm:~$ sudo ~/pox/pox.py misc.lab3controller
POX 0.2.0 (carp) / Copyright 2011-2013 James McCauley, et al.
INFO:core:POX 0.2.0 (carp) is up.
INFO:openflow.of_01:[00-00-00-00-00-02 1] connected
INFO:openflow.of_01:[None 2] closed
INFO:openflow.of_01:[00-00-00-00-00-01 3] connected
```

3. iperf h1 h3: this command tested the TCP bandwidth between h1 and h3 which we specified in our rules and matching, allowing only h1 and h3 to proceed with a FLOOD action given a TCP protocol. All the other hosts hang when using iperf because we blocked packet sending between the other host, which results in the terminal hanging.



```
mininet@mininet-vm: ~/pox/pox/misc
File Edit Tabs Help
mininet@mininet-vm:~/pox/pox/misc$ sudo python ~/lab3.py
mininet> iperf h1 h3
*** Iperf: testing TCP bandwidth between h1 and h3
C*** Results: ['19.8 Gbits/sec', '19.8 Gbits/sec']
Wmininet>
```

```
mininet@mininet-vm: ~
File Edit Tabs Help
POX 0.2.0 (carp) / Copyright 2011-2013 James McCauley, et al.
INFO:core:POX 0.2.0 (carp) is up.
INFO:openflow.of_01:[00-00-00-00-00-02 1] connected
INFO:openflow.of_01:[None 2] closed
INFO:openflow.of_01:[00-00-00-00-00-01 3] connected
INFO:openflow.of_01:[00-00-00-00-00-01 3] closed
^CINFO:core:Going down...
INFO:openflow.of_01:[00-00-00-00-00-02 1] disconnected
INFO:core:Down.
mininet@mininet-vm:~$ sudo ~/pox/pox.py misc.lab3controller
POX 0.2.0 (carp) / Copyright 2011-2013 James McCauley, et al.
INFO:core:POX 0.2.0 (carp) is up.
INFO:openflow.of_01:[00-00-00-00-00-02 1] connected
INFO:openflow.of_01:[None 2] closed
INFO:openflow.of_01:[00-00-00-00-00-01 3] connected
INFO:openflow.of_01:[00-00-00-00-00-01 3] closed
INFO:openflow.of_01:[None 4] closed
INFO:openflow.of_01:[00-00-00-00-00-01 5] connected
INFO:openflow.of_01:[00-00-00-00-00-01 5] closed
INFO:openflow.of_01:[None 6] closed
INFO:openflow.of_01:[00-00-00-00-00-01 7] connected
```