CLASS BASED QUEUING
Packet Configuration File

```
ext_if= "em0"
set skip on lo
# filter rules and anchor for ftp-proxy(8)
#anchor "ftp-proxy/*"
#pass in quick inet proto tcp to port ftp divert-to 127.0.0.1 port 8021
# anchor for relayd(8)
#anchor "relayd/*"
altq on $ext_if cbq bandwidth 2Mb queue { test_queue1_out, test_queue2_out }
queue test_queue1_out bandwidth 1.0Mb cbq(default)
queue test_queue2_out bandwidth 100Kb cbq
pass out keep state queue test_queue1_out
pass out proto tcp to any port 5002 keep state queue test_queue2_out
pass in inet proto icmp all keep state
pass in on $ext_if proto tcp keep state
pass in on $ext_if proto udp keep state
```

Mininet as Server and OpenBSD as client

```
mininet@mininet-vm:~$ iperf -s -p 5001
------------------------------------------------------------
Server listening on TCP port 5001
TCP window size: 85.3 KByte (default)
------------------------------------------------------------
[  4] local 192.168.106.101 port 5001 connected with 192.168.106.1 port 38859
[ ID] Interval       Transfer     Bandwidth
[  4]  0.0-10.7 sec  1.25 MBytes   976 Kbits/sec
```

```
# iperf -c "192.168.106.101" -p 5001
------------------------------------------------------------
Client connecting to 192.168.106.101, TCP port 5001
TCP window size: 17.1 KByte (default)
------------------------------------------------------------
[  3] local 10.0.2.15 port 7870 connected with 192.168.106.101 port 5001
[ ID] Interval       Transfer     Bandwidth
[  3]  0.0-10.1 sec  1.25 MBytes  1.04 Mbits/sec
```

Mininet as Client and OpenBSD as Server

```
mininet@mininet-vm:~$ iperf -c 192.168.116.101 -p 5001
------------------------------------------------------------
Client connecting to 192.168.116.101, TCP port 5001
TCP window size: 21.6 KByte (default)
------------------------------------------------------------
[  3] local 10.0.2.15 port 49041 connected with 192.168.116.101 port 5001
[ ID] Interval       Transfer     Bandwidth
[  3]  0.0-10.0 sec   187 MBytes   157 Mbits/sec
```

```
# iperf -s -p 5001
------------------------------------------------------------
Server listening on TCP port 5001
TCP window size: 16.0 KByte (default)
------------------------------------------------------------
[  4] local 192.168.116.101 port 5001 connected with 192.168.116.1 port 55029
[ ID] Interval       Transfer     Bandwidth
[  4]  0.0-10.0 sec   187 MBytes   157 Mbits/sec
```

Priority Based Queing

```
ext_if="em0"
set skip on lo
# filter rules and anchor for ftp-proxy(8)
#anchor "ftp-proxy/*"
#pass in quick inet proto tcp to port ftp divert-to 127.0.0.1 port 8021
# anchor for relayd(8)
#anchor "relayd/*"
altq on $ext_if priq bandwidth 2Mb queue { test_queue1_out, test_queue2_out }
queue test_queue1_out priority 2
queue test_queue2_out priq(default)
pass out keep state queue test_queue1_out
pass out proto tcp to any port 5002 keep state queue test_queue2_out
pass in inet proto icmp all keep state
```

pass in on $ext_if proto tcp keep state
pass in on $ext_if proto udp keep state

Mininet as Client and OpenBSD as Server

#iperf -s -p 5002

Server listening on TCP port 5002
TCP window size: 16.0 KByte (default)
---
[4] local 192.168.116.101 port 5002 connected with 192.168.116.1 port 52136
[ID] Interval Transfer Bandwidth
[4] 0.0-10.0 sec 188 MBytes 157 Mbits/sec

mininet@mininet-vm:~$ iperf -c 192.168.116.101 -p 5002

Client connecting to 192.168.116.101, TCP port 5002
TCP window size: 21.6 KByte (default)
---
[3] local 10.0.2.15 port 46611 connected with 192.168.116.101 port 5002
[ID] Interval Transfer Bandwidth
[3] 0.0-10.0 sec 188 MBytes 157 Mbits/sec

Mininet as Server and OpenBSD as client

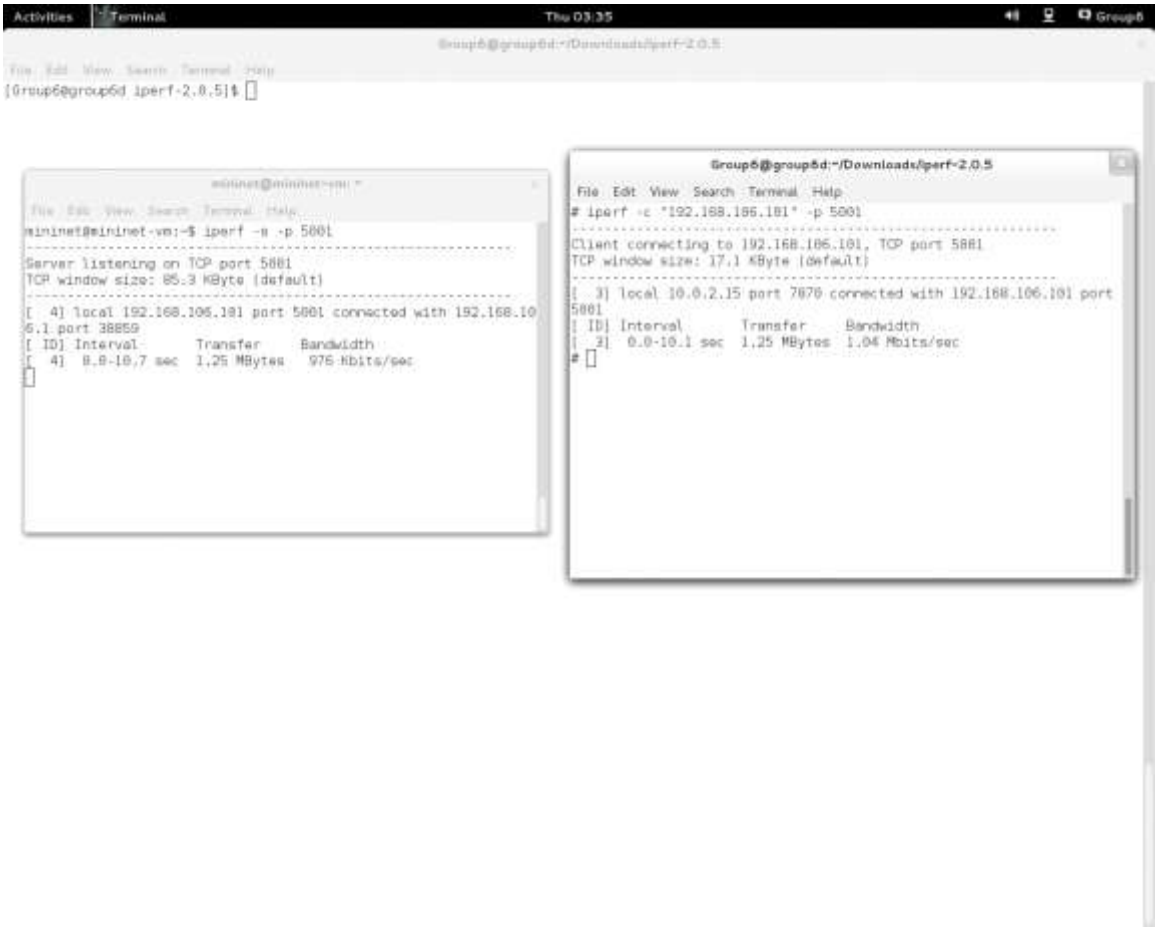
mininet@mininet-vm:~$ iperf -s -p 5002

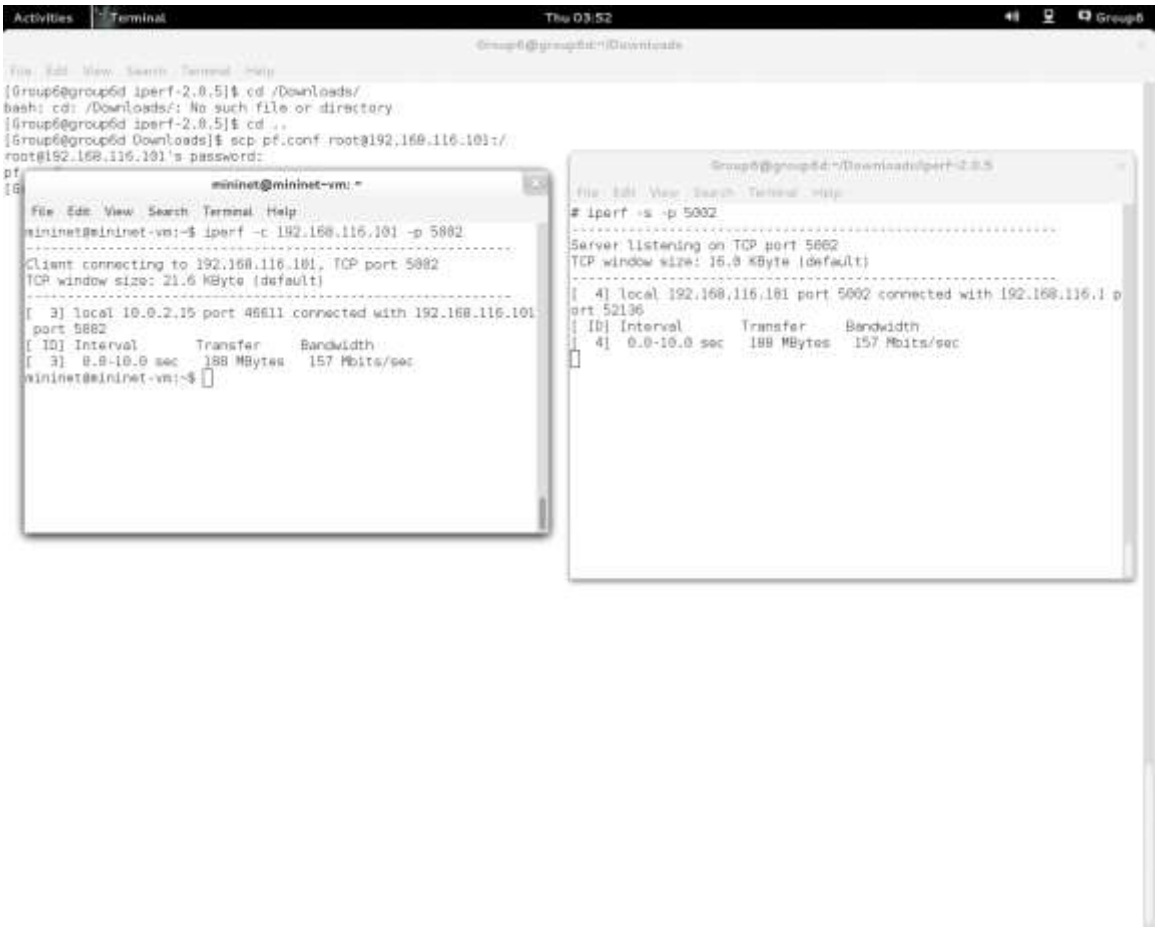
Server listening on TCP port 5002
TCP window size: 85.3 KByte (default)
---
[4] local 192.168.106.101 port 5002 connected with 192.168.106.1 port 58602
[ID] Interval Transfer Bandwidth
[4] 0.0-21.6 sec 256 KBytes 97.0 Kbits/sec

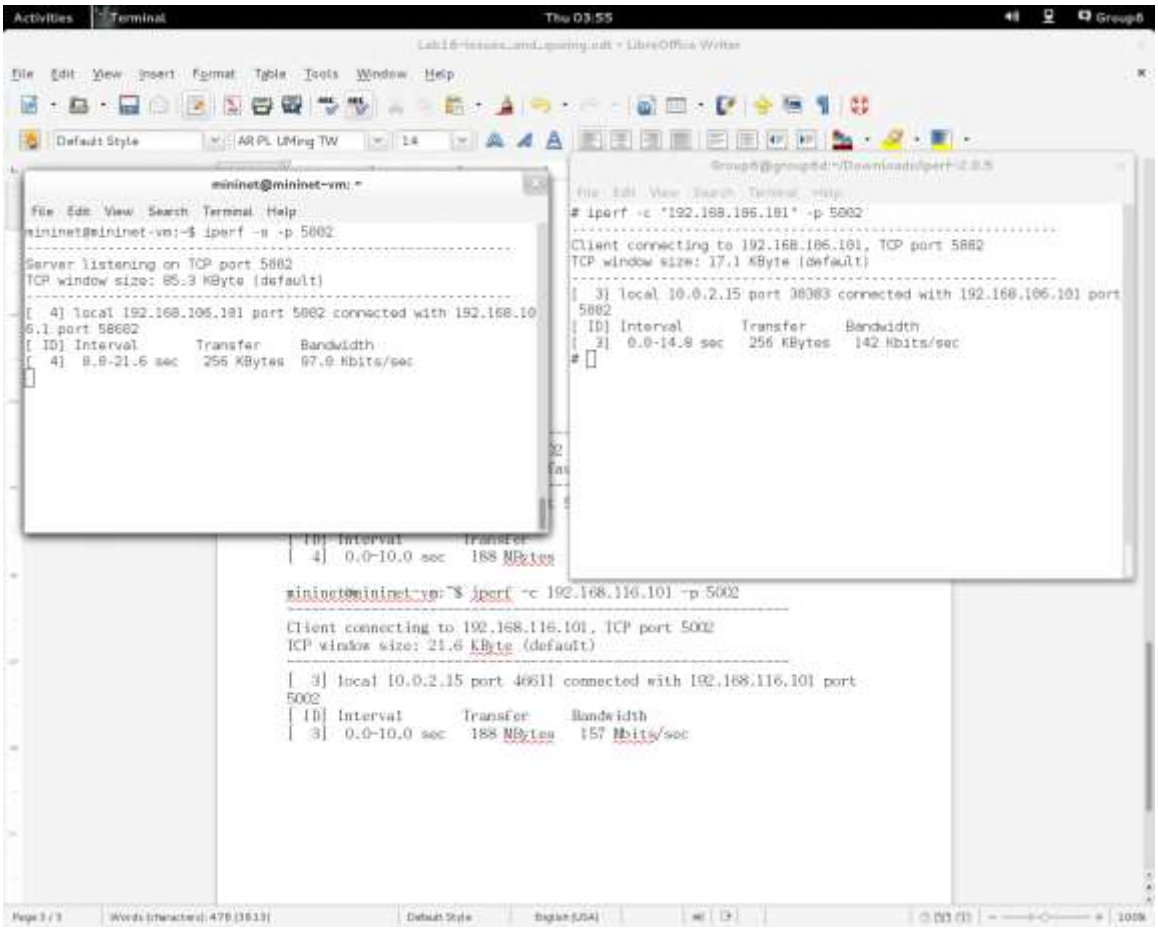
iperf -c "192.168.106.101" -p 5002

Client connecting to 192.168.106.101, TCP port 5002

TCP window size: 17.1 KByte (default)
---
[3] local 10.0.2.15 port 30383 connected with 192.168.106.101 port 5002
[ID] Interval   Transfer   Bandwidth
[3] 0.0-14.8 sec   256 KBytes   142 Kbits/sec




Activities
Terminal
Thu 03:52
Group6
[Group6@group6d iperf-2.0.5]$ cd /Downloads/
bash: cd: /Downloads/: No such file or directory
[Group6@group6d iperf-2.0.5]$ cd ..
[Group6@group6d Downloads]$ scp pf.conf root@192.168.116.101:/
root@192.168.116.101's password:
mininet@mininet-vm: ~
File Edit View Search Terminal Help
mininet@mininet-vm:~$ iperf -c 192.168.116.101 -p 5002
Client connecting to 192.168.116.101, TCP port 5002
TCP window size: 21.6 KByte (default)
[3] local 10.0.2.15 port 46611 connected with 192.168.116.101
port 5002
[ID] Interval Transfer Bandwidth
[3] 0.0-10.0 sec 188 MBytes 157 Mbits/sec
mininet@mininet-vm:~$
iperf -s -p 5002
Server listening on TCP port 5002
TCP window size: 85.3 KByte (default)
[4] local 192.168.116.101 port 5002 connected with 192.168.116.1 p
ort 52136
[ID] Interval Transfer Bandwidth
[4] 0.0-10.0 sec 188 MBytes 157 Mbits/sec


Activities
Terminal
Thu 03:55
Group6
File Edit View Insert Format Table Tools Window Help
mininet@mininet-vm: ~
File Edit View Search Terminal Help
mininet@mininet-vm:~$ iperf -s -p 5002
Server listening on TCP port 5002
TCP window size: 85.3 KByte (default)
[4] local 192.168.106.101 port 5002 connected with 192.168.106.1 port 58662
[ID] Interval Transfer Bandwidth
[4] 0.0-21.6 sec 256 KBytes 97.0 Kbits/sec
iperf -c "192.168.106.101" -p 5002
Client connecting to 192.168.106.101, TCP port 5002
TCP window size: 17.1 KByte (default)
[3] local 10.0.2.15 port 38383 connected with 192.168.106.101 port 5002
[ID] Interval Transfer Bandwidth
[3] 0.0-14.8 sec 256 KBytes 142 Kbits/sec
[4] 0.0-10.0 sec 188 MBytes
mininet@mininet-vm:~$ iperf -c 192.168.116.101 -p 5002
Client connecting to 192.168.116.101, TCP port 5002
TCP window size: 21.6 KByte (default)
[3] local 10.0.2.15 port 40611 connected with 192.168.116.101 port 5002
[ID] Interval Transfer Bandwidth
[3] 0.0-10.0 sec 188 MBytes 157 Mbits/sec