Trabalho Mininet Conceitos Iniciais

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Criando topologia considerando endereço MAC padronizado, bw de 25Mbps e controlador do Mininet.

```
mininet@mininet-vm:~$ sudo mn --topo tree,depth=4,fanout=2 --link tc,bw=25 --mac
*** Creating network
*** Adding controller
*** Adding hosts:
h1 h2 h3 h4 h5 h6 h7 h8 h9 h10 h11 h12 h13 h14 h15 h16
*** Adding switches:
s1 s2 s3 s4 s5 s6 s7 s8 s9 s10 s11 s12 s13 s14 s15
*** Adding links:
(25.00Mbit) (25.00Mbit) (s1, s2) (25.00Mbit) (25.00Mbit) (s1, s9) (25.00Mbit) (2
5.00Mbit) (s2, s3) (25.00Mbit) (25.00Mbit) (s2, s6) (25.00Mbit) (25.00Mbit) (s3,
 s4) (25.00Mbit) (25.00Mbit) (s3, s5) (25.00Mbit) (25.00Mbit) (s4, h1) (25.00Mbi
t) (25.00Mbit) (s4, h2) (25.00Mbit) (25.00Mbit) (s5, h3) (25.00Mbit) (25.00Mbit)
 (s5, h4) (25.00Mbit) (25.00Mbit) (s6, s7) (25.00Mbit) (25.00Mbit) (s6, s8) (25.
00Mbit) (25.00Mbit) (s7, h5) (25.00Mbit) (25.00Mbit) (s7, h6) (25.00Mbit) (25.00
Mbit) (s8, h7) (25.00Mbit) (25.00Mbit) (s8, h8) (25.00Mbit) (25.00Mbit) (s9, s10
) (25.00Mbit) (25.00Mbit) (s9, s13) (25.00Mbit) (25.00Mbit) (s10, s11) (25.00Mbi
t) (25.00Mbit) (s10, s12) (25.00Mbit) (25.00Mbit) (s11, h9) (25.00Mbit) (25.00Mb
it) (s11, h10) (25.00Mbit) (25.00Mbit) (s12, h11) (25.00Mbit) (25.00Mbit) (s12,
h12) (25.00Mbit) (25.00Mbit) (s13, s14) (25.00Mbit) (25.00Mbit) (s13, s15) (25.0
0Mbit) (25.00Mbit) (s14, h13) (25.00Mbit) (25.00Mbit) (s14, h14) (25.00Mbit) (25
.00Mbit) (s15, h15) (25.00Mbit) (25.00Mbit) (s15, h16)
*** Configuring hosts
h1 h2 h3 h4 h5 h6 h7 h8 h9 h10 h11 h12 h13 h14 h15 h16
*** Starting controller
c0
*** Starting 15 switches
s1 s2 s3 s4 s5 s6 s7 s8 s9 s10 s11 s12 s13 s14 s15 ...(25.00Mbit) (25.00Mbit) (2
5.00Mbit) (25.00Mbit) (25.00Mbit) (25.00Mbit) (25.00Mbit) (25.00Mbit) (25.00Mbit
) (25.00Mbit) (25.00Mbit) (25.00Mbit) (25.00Mbit) (25.00Mbit) (25.00Mbit) (25.00
Mbit) (25.00Mbit) (25.00Mbit) (25.00Mbit) (25.00Mbit) (25.00Mbit) (25.00Mbit) (2
5.00Mbit) (25.00Mbit) (25.00Mbit) (25.00Mbit) (25.00Mbit) (25.00Mbit) (25.00Mbit
) (25.00Mbit) (25.00Mbit) (25.00Mbit) (25.00Mbit) (25.00Mbit) (25.00Mbit) (25.00
Mbit) (25.00Mbit) (25.00Mbit) (25.00Mbit) (25.00Mbit) (25.00Mbit) (25.00Mbit) (2
5.00Mbit) (25.00Mbit)
*** Starting CLI:
mininet>
```

Inspecionando informações das interfaces, endereços MAC, IP e portas.

```
mininet> dump
<Host h1: h1-eth0:10.0.0.1 pid=1505>
<Host h2: h2-eth0:10.0.0.2 pid=1507>
<Host h3: h3-eth0:10.0.0.3 pid=1509>
<Host h4: h4-eth0:10.0.0.4 pid=1511>
<Host h5: h5-eth0:10.0.0.5 pid=1513>
<Host h6: h6-eth0:10.0.0.6 pid=1515>
<Host h7: h7-eth0:10.0.0.7 pid=1517>
<Host h8: h8-eth0:10.0.0.8 pid=1519>
<Host h9: h9-eth0:10.0.0.9 pid=1521>
<Host h10: h10-eth0:10.0.0.10 pid=1523>
<Host h11: h11-eth0:10.0.0.11 pid=1525>
<Host h12: h12-eth0:10.0.0.12 pid=1527>
<Host h13: h13-eth0:10.0.0.13 pid=1529>
<Host h14: h14-eth0:10.0.0.14 pid=1531>
<Host h15: h15-eth0:10.0.0.15 pid=1533>
<Host h16: h16-eth0:10.0.0.16 pid=1535>
<OVSSwitch s1: lo:127.0.0.1,s1-eth1:None,s1-eth2:None pid=1540>
<OVSSwitch s2: lo:127.0.0.1,s2-eth1:None,s2-eth2:None,s2-eth3:None pid=1543>
<OVSSwitch s3: lo:127.0.0.1,s3-eth1:None,s3-eth2:None,s3-eth3:None pid=1546>
<OVSSwitch s4: lo:127.0.0.1,s4-eth1:None,s4-eth2:None,s4-eth3:None pid=1549>
<OVSSwitch s5: lo:127.0.0.1,s5-eth1:None,s5-eth2:None,s5-eth3:None pid=1552>
<OVSSwitch s6: lo:127.0.0.1,s6-eth1:None,s6-eth2:None,s6-eth3:None pid=1555>
<OVSSwitch s7: lo:127.0.0.1,s7-eth1:None,s7-eth2:None,s7-eth3:None pid=1558>
<OVSSwitch s8: lo:127.0.0.1,s8-eth1:None,s8-eth2:None,s8-eth3:None pid=1561>
<OVSSwitch s9: lo:127.0.0.1,s9-eth1:None,s9-eth2:None,s9-eth3:None pid=1564>
<OVSSwitch s10: lo:127.0.0.1,s10-eth1:None,s10-eth2:None,s10-eth3:None pid=1567>
<OVSSwitch s11: lo:127.0.0.1,s11-eth1:None,s11-eth2:None,s11-eth3:None pid=1570>
<OVSSwitch s12: lo:127.0.0.1,s12-eth1:None,s12-eth2:None,s12-eth3:None pid=1573>
<OVSSwitch s13: lo:127.0.0.1,s13-eth1:None,s13-eth2:None,s13-eth3:None pid=1576>
<OVSSwitch s14: lo:127.0.0.1,s14-eth1:None,s14-eth2:None,s14-eth3:None pid=1579>
<OVSSwitch s15: lo:127.0.0.1,s15-eth1:None,s15-eth2:None,s15-eth3:None pid=1582>
<Controller c0: 127.0.0.1:6653 pid=1498>
```

Inspecionando informações das interfaces, endereços MAC, IP e portas.

```
mininet> net
h1 h1-eth0:s4-eth1
h2 h2-eth0:s4-eth2
h3 h3-eth0:s5-eth1
h4 h4-eth0:s5-eth2
h5 h5-eth0:s7-eth1
h6 h6-eth0:s7-eth2
h7 h7-eth0:s8-eth1
h8 h8-eth0:s8-eth2
h9 h9-eth0:s11-eth1
h10 h10-eth0:s11-eth2
h11 h11-eth0:s12-eth1
h12 h12-eth0:s12-eth2
h13 h13-eth0:s14-eth1
h14 h14-eth0:s14-eth2
h15 h15-eth0:s15-eth1
h16 h16-eth0:s15-eth2
s1 lo:  s1-eth1:s2-eth3 s1-eth2:s9-eth3
s2 lo:  s2-eth1:s3-eth3 s2-eth2:s6-eth3 s2-eth3:s1-eth1
s3 lo:  s3-eth1:s4-eth3 s3-eth2:s5-eth3 s3-eth3:s2-eth1
s4 lo:  s4-eth1:h1-eth0 s4-eth2:h2-eth0 s4-eth3:s3-eth1
s5 lo:  s5-eth1:h3-eth0 s5-eth2:h4-eth0 s5-eth3:s3-eth2
s6 lo:  s6-eth1:s7-eth3 s6-eth2:s8-eth3 s6-eth3:s2-eth2
s7 lo:  s7-eth1:h5-eth0 s7-eth2:h6-eth0 s7-eth3:s6-eth1
s8 lo:  s8-eth1:h7-eth0 s8-eth2:h8-eth0 s8-eth3:s6-eth2
s9 lo:  s9-eth1:s10-eth3 s9-eth2:s13-eth3 s9-eth3:s1-eth2
s10 lo:  s10-eth1:s11-eth3 s10-eth2:s12-eth3 s10-eth3:s9-eth1
s11 lo:  s11-eth1:h9-eth0 s11-eth2:h10-eth0 s11-eth3:s10-eth1
s12 lo:  s12-eth1:h11-eth0 s12-eth2:h12-eth0 s12-eth3:s10-eth2
s13 lo:  s13-eth1:s14-eth3 s13-eth2:s15-eth3 s13-eth3:s9-eth2
s14 lo:  s14-eth1:h13-eth0 s14-eth2:h14-eth0 s14-eth3:s13-eth1
s15 lo:  s15-eth1:h15-eth0 s15-eth2:h16-eth0 s15-eth3:s13-eth2
c0
```

Inspecionando informações das interfaces, endereços MAC, IP e portas.

```
mininet> h1 ifconfig
h1-eth0   Link encap:Ethernet  HWaddr 00:00:00:00:00:01
          inet addr:10.0.0.1  Bcast:10.255.255.255  Mask:255.0.0.0
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:0 errors:0 dropped:0 overruns:0 frame:0
          TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:0 (0.0 B)  TX bytes:0 (0.0 B)

lo        Link encap:Local Loopback
          inet addr:127.0.0.1  Mask:255.0.0.0
          UP LOOPBACK RUNNING  MTU:65536  Metric:1
          RX packets:0 errors:0 dropped:0 overruns:0 frame:0
          TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:0
          RX bytes:0 (0.0 B)  TX bytes:0 (0.0 B)

mininet> h2 ifconfig
h2-eth0   Link encap:Ethernet  HWaddr 00:00:00:00:00:02
          inet addr:10.0.0.2  Bcast:10.255.255.255  Mask:255.0.0.0
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:0 errors:0 dropped:0 overruns:0 frame:0
          TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:0 (0.0 B)  TX bytes:0 (0.0 B)

lo        Link encap:Local Loopback
          inet addr:127.0.0.1  Mask:255.0.0.0
          UP LOOPBACK RUNNING  MTU:65536  Metric:1
          RX packets:0 errors:0 dropped:0 overruns:0 frame:0
          TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:0
          RX bytes:0 (0.0 B)  TX bytes:0 (0.0 B)
```

Inspecionando informações das interfaces, endereços MAC, IP e portas.

```
mininet> s1 ifconfig
eth0      Link encap:Ethernet  HWaddr 08:00:27:f3:26:ad
          inet addr:10.0.2.15  Bcast:10.0.2.255  Mask:255.255.255.0
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:341 errors:0 dropped:0 overruns:0 frame:0
          TX packets:344 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:38731 (38.7 KB)  TX bytes:30885 (30.8 KB)

eth1      Link encap:Ethernet  HWaddr 08:00:27:9e:d8:b1
          inet addr:192.168.56.101  Bcast:192.168.56.255  Mask:255.255.255.0
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:418 errors:0 dropped:0 overruns:0 frame:0
          TX packets:473 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:35338 (35.3 KB)  TX bytes:65093 (65.0 KB)

lo        Link encap:Local Loopback
          inet addr:127.0.0.1  Mask:255.0.0.0
          UP LOOPBACK RUNNING  MTU:65536  Metric:1
          RX packets:3215 errors:0 dropped:0 overruns:0 frame:0
          TX packets:3215 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:0
          RX bytes:189164 (189.1 KB)  TX bytes:189164 (189.1 KB)

s1        Link encap:Ethernet  HWaddr 0e:88:c5:3d:5e:42
          UP BROADCAST RUNNING  MTU:1500  Metric:1
          RX packets:0 errors:0 dropped:0 overruns:0 frame:0
          TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:0
          RX bytes:0 (0.0 B)  TX bytes:0 (0.0 B)

s2        Link encap:Ethernet  HWaddr 32:db:e1:c0:b2:45
          UP BROADCAST RUNNING  MTU:1500  Metric:1
          RX packets:0 errors:0 dropped:0 overruns:0 frame:0
          TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:0
          RX bytes:0 (0.0 B)  TX bytes:0 (0.0 B)
```

Executando testes de ping entre diferentes nós.

```
mininet> h1 ping h2
PING 10.0.0.2 (10.0.0.2) 56(84) bytes of data.
64 bytes from 10.0.0.2: icmp_seq=1 ttl=64 time=0.254 ms
64 bytes from 10.0.0.2: icmp_seq=2 ttl=64 time=0.269 ms
64 bytes from 10.0.0.2: icmp_seq=3 ttl=64 time=0.056 ms
64 bytes from 10.0.0.2: icmp_seq=4 ttl=64 time=0.037 ms
64 bytes from 10.0.0.2: icmp_seq=5 ttl=64 time=0.057 ms
64 bytes from 10.0.0.2: icmp_seq=6 ttl=64 time=0.067 ms
64 bytes from 10.0.0.2: icmp_seq=7 ttl=64 time=0.035 ms
64 bytes from 10.0.0.2: icmp_seq=8 ttl=64 time=0.053 ms
64 bytes from 10.0.0.2: icmp_seq=9 ttl=64 time=0.036 ms
64 bytes from 10.0.0.2: icmp_seq=10 ttl=64 time=0.046 ms
64 bytes from 10.0.0.2: icmp_seq=11 ttl=64 time=0.057 ms
c64 bytes from 10.0.0.2: icmp_seq=12 ttl=64 time=0.057 ms
64 bytes from 10.0.0.2: icmp_seq=13 ttl=64 time=0.045 ms
64 bytes from 10.0.0.2: icmp_seq=14 ttl=64 time=0.041 ms
^C
--- 10.0.0.2 ping statistics ---
14 packets transmitted, 14 received, 0% packet loss, time 12997ms
rtt min/avg/max/mdev = 0.035/0.079/0.269/0.075 ms
```

Executando testes de ping entre diferentes nós.

```
mininet> h6 ping h13
PING 10.0.0.13 (10.0.0.13) 56(84) bytes of data.
64 bytes from 10.0.0.13: icmp_seq=1 ttl=64 time=10.4 ms
64 bytes from 10.0.0.13: icmp_seq=2 ttl=64 time=4.18 ms
64 bytes from 10.0.0.13: icmp_seq=3 ttl=64 time=0.814 ms
64 bytes from 10.0.0.13: icmp_seq=4 ttl=64 time=0.080 ms
64 bytes from 10.0.0.13: icmp_seq=5 ttl=64 time=0.066 ms
64 bytes from 10.0.0.13: icmp_seq=6 ttl=64 time=0.065 ms
64 bytes from 10.0.0.13: icmp_seq=7 ttl=64 time=0.316 ms
^C
--- 10.0.0.13 ping statistics ---
7 packets transmitted, 7 received, 0% packet loss, time 6003ms
rtt min/avg/max/mdev = 0.065/2.275/10.408/3.592 ms
```

Criando topologia considerando endereço MAC padronizado, bw de 10Mbps e controlador do Mininet.

```
mininet@mininet-vm:~$ sudo mn --topo tree,depth=4,fanout=2 --link tc,bw=10 --mac
*** Creating network
*** Adding controller
*** Adding hosts:
h1 h2 h3 h4 h5 h6 h7 h8 h9 h10 h11 h12 h13 h14 h15 h16
*** Adding switches:
s1 s2 s3 s4 s5 s6 s7 s8 s9 s10 s11 s12 s13 s14 s15
*** Adding links:
(10.00Mbit) (10.00Mbit) (s1, s2) (10.00Mbit) (10.00Mbit) (s1, s9) (10.00Mbit) (1
0.00Mbit) (s2, s3) (10.00Mbit) (10.00Mbit) (s2, s6) (10.00Mbit) (10.00Mbit) (s3,
 s4) (10.00Mbit) (10.00Mbit) (s3, s5) (10.00Mbit) (10.00Mbit) (s4, h1) (10.00Mbi
t) (10.00Mbit) (s4, h2) (10.00Mbit) (10.00Mbit) (s5, h3) (10.00Mbit) (10.00Mbit)
 (s5, h4) (10.00Mbit) (10.00Mbit) (s6, s7) (10.00Mbit) (10.00Mbit) (s6, s8) (10.
00Mbit) (10.00Mbit) (s7, h5) (10.00Mbit) (10.00Mbit) (s7, h6) (10.00Mbit) (10.00
Mbit) (s8, h7) (10.00Mbit) (10.00Mbit) (s8, h8) (10.00Mbit) (10.00Mbit) (s9, s10
) (10.00Mbit) (10.00Mbit) (s9, s13) (10.00Mbit) (10.00Mbit) (s10, s11) (10.00Mbi
t) (10.00Mbit) (s10, s12) (10.00Mbit) (10.00Mbit) (s11, h9) (10.00Mbit) (10.00Mb
it) (s11, h10) (10.00Mbit) (10.00Mbit) (s12, h11) (10.00Mbit) (10.00Mbit) (s12,
h12) (10.00Mbit) (10.00Mbit) (s13, s14) (10.00Mbit) (10.00Mbit) (s13, s15) (10.0
0Mbit) (10.00Mbit) (s14, h13) (10.00Mbit) (10.00Mbit) (s14, h14) (10.00Mbit) (10
.00Mbit) (s15, h15) (10.00Mbit) (10.00Mbit) (s15, h16)
*** Configuring hosts
h1 h2 h3 h4 h5 h6 h7 h8 h9 h10 h11 h12 h13 h14 h15 h16
*** Starting controller
c0
*** Starting 15 switches
s1 s2 s3 s4 s5 s6 s7 s8 s9 s10 s11 s12 s13 s14 s15 ...(10.00Mbit) (10.00Mbit) (1
0.00Mbit) (10.00Mbit) (10.00Mbit) (10.00Mbit) (10.00Mbit) (10.00Mbit) (10.00Mbit
) (10.00Mbit) (10.00Mbit) (10.00Mbit) (10.00Mbit) (10.00Mbit) (10.00Mbit) (10.00
Mbit) (10.00Mbit) (10.00Mbit) (10.00Mbit) (10.00Mbit) (10.00Mbit) (10.00Mbit) (1
0.00Mbit) (10.00Mbit) (10.00Mbit) (10.00Mbit) (10.00Mbit) (10.00Mbit) (10.00Mbit
) (10.00Mbit) (10.00Mbit) (10.00Mbit) (10.00Mbit) (10.00Mbit) (10.00Mbit) (10.00
Mbit) (10.00Mbit) (10.00Mbit) (10.00Mbit) (10.00Mbit) (10.00Mbit) (10.00Mbit) (1
0.00Mbit) (10.00Mbit)
*** Starting CLI:
```

Especificando que o host 1 na porta 5555 é servidor TCP e o host 2 é cliente. Executando testes de iperf, considerando um relatório por segundo com teste de 25 segundos.

"Node: h1"

```
root@mininet-vm:~# iperf -s -p 5555 -i 1
------------------------------------------------------------
Server listening on TCP port 5555
TCP window size: 85.3 KByte (default)
------------------------------------------------------------
[ 70] local 10.0.0.1 port 5555 connected with 10.0.0.2 port 51666
[ ID] Interval       Transfer     Bandwidth
[ 70]  0.0- 1.0 sec  1.15 MBytes  9.61 Mbits/sec
[ 70]  1.0- 2.0 sec  1.14 MBytes  9.57 Mbits/sec
[ 70]  2.0- 3.0 sec  1.14 MBytes  9.53 Mbits/sec
[ 70]  3.0- 4.0 sec  1.14 MBytes  9.57 Mbits/sec
[ 70]  4.0- 5.0 sec  1.14 MBytes  9.57 Mbits/sec
[ 70]  5.0- 6.0 sec  1.14 MBytes  9.58 Mbits/sec
[ 70]  6.0- 7.0 sec  1.14 MBytes  9.52 Mbits/sec
[ 70]  7.0- 8.0 sec  1.14 MBytes  9.57 Mbits/sec
[ 70]  8.0- 9.0 sec  1.14 MBytes  9.58 Mbits/sec
[ 70]  9.0-10.0 sec  1.14 MBytes  9.56 Mbits/sec
[ 70] 10.0-11.0 sec  1.14 MBytes  9.59 Mbits/sec
[ 70] 11.0-12.0 sec  1.14 MBytes  9.55 Mbits/sec
[ 70] 12.0-13.0 sec  1.14 MBytes  9.55 Mbits/sec
[ 70] 13.0-14.0 sec  1.14 MBytes  9.57 Mbits/sec
[ 70] 14.0-15.0 sec  1.14 MBytes  9.58 Mbits/sec
[ 70] 15.0-16.0 sec  1.14 MBytes  9.57 Mbits/sec
[ 70] 16.0-17.0 sec  1.14 MBytes  9.57 Mbits/sec
[ 70] 17.0-18.0 sec  1.14 MBytes  9.53 Mbits/sec
[ 70] 18.0-19.0 sec  1.14 MBytes  9.57 Mbits/sec
[ 70] 19.0-20.0 sec  1.14 MBytes  9.57 Mbits/sec
[ 70] 20.0-21.0 sec  1.14 MBytes  9.58 Mbits/sec
[ 70] 21.0-22.0 sec  1.14 MBytes  9.57 Mbits/sec
[ 70] 22.0-23.0 sec  1.14 MBytes  9.58 Mbits/sec
[ 70] 23.0-24.0 sec  1.14 MBytes  9.52 Mbits/sec
[ 70] 24.0-25.0 sec  1.14 MBytes  9.57 Mbits/sec
[ 70]  0.0-25.3 sec  28.9 MBytes  9.57 Mbits/sec
```

"Node: h2"

```
root@mininet-vm:~# iperf -c 10.0.0.1 -p 5555 -i 1 -t 25
------------------------------------------------------------
Client connecting to 10.0.0.1, TCP port 5555
TCP window size: 85.3 KByte (default)
------------------------------------------------------------
[ 69] local 10.0.0.2 port 51666 connected with 10.0.0.1 port 5555
[ ID] Interval       Transfer     Bandwidth
[ 69]  0.0- 1.0 sec  1.38 MBytes  11.5 Mbits/sec
[ 69]  1.0- 2.0 sec  1.12 MBytes  9.44 Mbits/sec
[ 69]  2.0- 3.0 sec  1.25 MBytes  10.5 Mbits/sec
[ 69]  3.0- 4.0 sec  1.12 MBytes  9.44 Mbits/sec
[ 69]  4.0- 5.0 sec  1.12 MBytes  9.44 Mbits/sec
[ 69]  5.0- 6.0 sec  1.12 MBytes  9.44 Mbits/sec
[ 69]  6.0- 7.0 sec  1.12 MBytes  9.44 Mbits/sec
[ 69]  7.0- 8.0 sec  1.12 MBytes  9.44 Mbits/sec
[ 69]  8.0- 9.0 sec  1.25 MBytes  10.5 Mbits/sec
[ 69]  9.0-10.0 sec  1.00 MBytes  8.39 Mbits/sec
[ 69] 10.0-11.0 sec  1.12 MBytes  9.44 Mbits/sec
[ 69] 11.0-12.0 sec  1.12 MBytes  9.44 Mbits/sec
[ 69] 12.0-13.0 sec  1.12 MBytes  9.44 Mbits/sec
[ 69] 13.0-14.0 sec  1.12 MBytes  9.44 Mbits/sec
[ 69] 14.0-15.0 sec  1.25 MBytes  10.5 Mbits/sec
[ 69] 15.0-16.0 sec  1.12 MBytes  9.44 Mbits/sec
[ 69] 16.0-17.0 sec  1.12 MBytes  9.44 Mbits/sec
[ 69] 17.0-18.0 sec  1.12 MBytes  9.44 Mbits/sec
[ 69] 18.0-19.0 sec  1.12 MBytes  9.44 Mbits/sec
[ 69] 19.0-20.0 sec  1.25 MBytes  10.5 Mbits/sec
[ 69] 20.0-21.0 sec  1.12 MBytes  9.44 Mbits/sec
[ 69] 21.0-22.0 sec  1.12 MBytes  9.44 Mbits/sec
[ 69] 22.0-23.0 sec  1.12 MBytes  9.44 Mbits/sec
[ 69] 23.0-24.0 sec  1.12 MBytes  9.44 Mbits/sec
[ 69] 24.0-25.0 sec  1.12 MBytes  9.44 Mbits/sec
[ 69]  0.0-25.1 sec  28.9 MBytes  9.64 Mbits/sec
root@mininet-vm:~#
```