



Лабораторная работа N°2

по дисциплине Моделирование сетей передачи данных

Ход работы

Сеть

Адаптер 1 Адаптер 2 Адаптер 3 Адаптер 4

☒ Включить сетевой адаптер

Тип подключения: NAT

Имя:

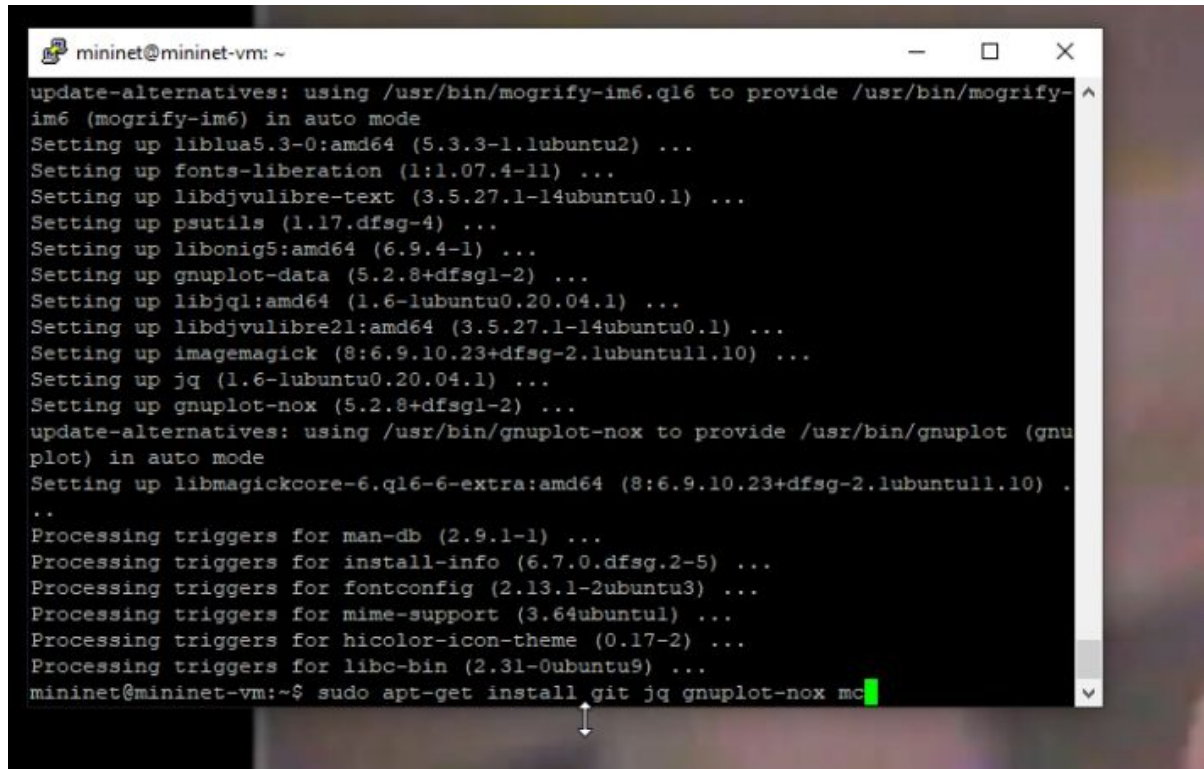
▶ Дополнительно

Mininet-VM [Работает] - Oracle VM VirtualBox

Файл Машина Вид Ввод Устройства Справка

```
This file describes the network interfaces available on your system
For more information, see netplan(5).
network:
  version: 2
  renderer: networkd
  ethernets:
    eth0:
      dhcp4: yes
    eth1:
      dhcp4: yes_
```

Ход работы



```
mininet@mininet-vm: ~  
update-alternatives: using /usr/bin/mogrify-im6.q16 to provide /usr/bin/mogrify-  
im6 (mogrify-im6) in auto mode  
Setting up liblua5.3-0:amd64 (5.3.3-1.lubuntu2) ...  
Setting up fonts-liberation (1:1.07.4-11) ...  
Setting up libdjvulibre-text (3.5.27.1-14ubuntu0.1) ...  
Setting up psutils (1.17.dfsg-4) ...  
Setting up libonig5:amd64 (6.9.4-1) ...  
Setting up gnuplot-data (5.2.8+dfsg1-2) ...  
Setting up libjql:amd64 (1.6-lubuntu0.20.04.1) ...  
Setting up libdjvulibre21:amd64 (3.5.27.1-14ubuntu0.1) ...  
Setting up imagemagick (8:6.9.10.23+dfsg-2.lubuntull.10) ...  
Setting up jq (1.6-lubuntu0.20.04.1) ...  
Setting up gnuplot-nox (5.2.8+dfsg1-2) ...  
update-alternatives: using /usr/bin/gnuplot-nox to provide /usr/bin/gnuplot (gnu  
plot) in auto mode  
Setting up libmagickcore-6.q16-6-extra:amd64 (8:6.9.10.23+dfsg-2.lubuntull.10) .  
..  
Processing triggers for man-db (2.9.1-1) ...  
Processing triggers for install-info (6.7.0.dfsg.2-5) ...  
Processing triggers for fontconfig (2.13.1-2ubuntu3) ...  
Processing triggers for mime-support (3.64ubuntu1) ...  
Processing triggers for hicolor-icon-theme (0.17-2) ...  
Processing triggers for libc-bin (2.31-0ubuntu9) ...  
mininet@mininet-vm:~$ sudo apt-get install git jq gnuplot-nox mc
```

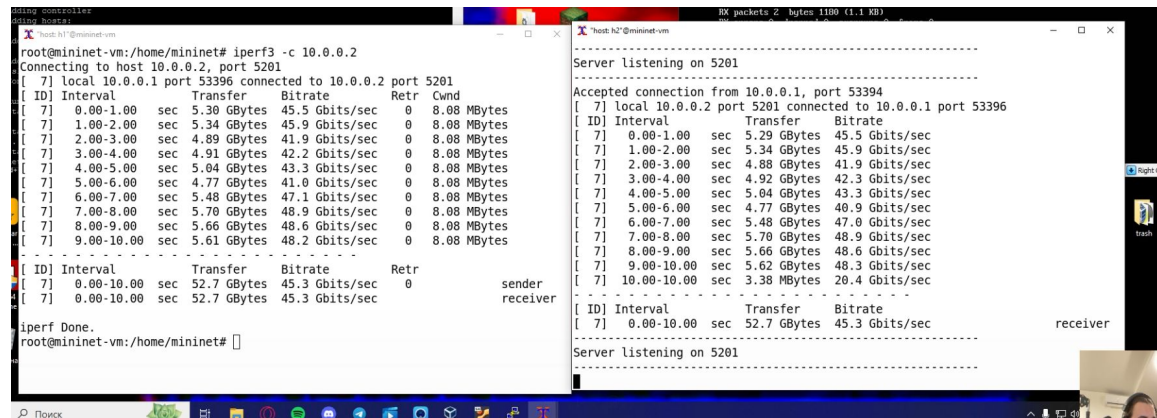
Ход работы

```
mininet@mininet-vm: ~  
Setting up libssh2-1:amd64 (1.8.0-2.1ubuntu0.1) ...  
Setting up mc (3:4.8.24-2ubuntu1) ...  
Processing triggers for man-db (2.9.1-1) ...  
Processing triggers for mime-support (3.64ubuntu1) ...  
Processing triggers for hicolor-icon-theme (0.17-2) ...  
Processing triggers for libc-bin (2.31-0ubuntu9) ...  
mininet@mininet-vm:~$ cd /tmp  
mininet@mininet-vm:/tmp$ git clone https://github.com/ekfoury/iperf3_plotter.git  
Cloning into 'iperf3_plotter'...  
remote: Enumerating objects: 74, done.  
remote: Total 74 (delta 0), reused 0 (delta 0), pack-reused 74 (from 1)  
Unpacking objects: 100% (74/74), 100.09 KiB | 726.00 KiB/s, done.  
mininet@mininet-vm:/tmp$ cd iperf3_plotter/  
mininet@mininet-vm:/tmp/iperf3_plotter$ ls  
fairness.sh      plot_iperf.sh      plot_rtt_var.plt    sample  
Makefile         plot_pmtu.plt      plot_throughput.plt  
plot_bytes.plt   plot_retransmits.plt  preprocessor.sh  
plot_cwnd.plt    plot_rtt.plt        README.md  
mininet@mininet-vm:/tmp/iperf3_plotter$ cd ..  
mininet@mininet-vm:/tmp$ cd /tmp/iperf3_plotter/  
mininet@mininet-vm:/tmp/iperf3_plotter$ sudo cp plot_* /usr/bin  
mininet@mininet-vm:/tmp/iperf3_plotter$ sudo cp *.sh /usr/bin  
mininet@mininet-vm:/tmp/iperf3_plotter$ cd  
mininet@mininet-vm:~$
```

Ход работы

```
*** Stopping 1 switches
s1
*** Stopping 2 hosts
h1 h2
*** Done
completed in 15.251 seconds
mininet@mininet-vm:~$ xauth list $DISPLAY
mininet-vm/unix:10 MIT-MAGIC-COOKIE-1 ff3b101d369eld9beafcac0aa7478811
mininet@mininet-vm:~$ mininet-vm/unix:10 MIT-MAGIC-COOKIE-1 ff3b101d369eld9bea
fcac0aa7478811
-bash: mininet-vm/unix:10: No such file or directory
mininet@mininet-vm:~$ sudo -i
root@mininet-vm:~# xauth list $DISPLAY
mininet-vm/unix:10 MIT-MAGIC-COOKIE-1 79e850d97073fd21c4b920ddc91d3585
root@mininet-vm:~# xauth add mininet-vm/unix:10 MIT-MAGIC-COOKIE-1 ff3b101d369eld9beafcac0a
a7478811
root@mininet-vm:~# logout
mininet@mininet-vm:~$ xauth list $DISPLAY
mininet-vm/unix:10 MIT-MAGIC-COOKIE-1 ff3b101d369eld9beafcac0aa7478811
mininet@mininet-vm:~$
```

Ход работы



```
root@mininet-vm:/home/mininet# iperf3 -c 10.0.0.2
Connecting to host 10.0.0.2, port 5201
[ 7] local 10.0.0.1 port 53396 connected to 10.0.0.2 port 5201
[ ID] Interval      Transfer    Bitrate    Retr  Cwnd
[ 7] 0.00-1.00 sec  5.30 GBytes 45.5 Gbits/sec  0  8.08 MBytes
[ 7] 1.00-2.00 sec  5.34 GBytes 45.9 Gbits/sec  0  8.08 MBytes
[ 7] 2.00-3.00 sec  4.89 GBytes 41.9 Gbits/sec  0  8.08 MBytes
[ 7] 3.00-4.00 sec  4.91 GBytes 42.2 Gbits/sec  0  8.08 MBytes
[ 7] 4.00-5.00 sec  5.04 GBytes 43.3 Gbits/sec  0  8.08 MBytes
[ 7] 5.00-6.00 sec  4.77 GBytes 41.0 Gbits/sec  0  8.08 MBytes
[ 7] 6.00-7.00 sec  5.48 GBytes 47.1 Gbits/sec  0  8.08 MBytes
[ 7] 7.00-8.00 sec  5.70 GBytes 48.9 Gbits/sec  0  8.08 MBytes
[ 7] 8.00-9.00 sec  5.66 GBytes 48.6 Gbits/sec  0  8.08 MBytes
[ 7] 9.00-10.00 sec 5.61 GBytes 48.2 Gbits/sec  0  8.08 MBytes
-----
[ ID] Interval      Transfer    Bitrate    Retr  Cwnd
[ 7] 0.00-10.00 sec 52.7 GBytes 45.3 Gbits/sec  0
[ 7] 0.00-10.00 sec 52.7 GBytes 45.3 Gbits/sec  0

iperf Done.
root@mininet-vm:/home/mininet#
```

```
Server listening on 5201
-----
Accepted connection from 10.0.0.1, port 53394
[ 7] local 10.0.0.2 port 5201 connected to 10.0.0.1 port 53396
[ ID] Interval      Transfer    Bitrate    Retr  Cwnd
[ 7] 0.00-1.00 sec  5.29 GBytes 45.5 Gbits/sec  0  8.08 MBytes
[ 7] 1.00-2.00 sec  5.34 GBytes 45.9 Gbits/sec  0  8.08 MBytes
[ 7] 2.00-3.00 sec  4.88 GBytes 41.9 Gbits/sec  0  8.08 MBytes
[ 7] 3.00-4.00 sec  4.92 GBytes 42.3 Gbits/sec  0  8.08 MBytes
[ 7] 4.00-5.00 sec  5.04 GBytes 43.3 Gbits/sec  0  8.08 MBytes
[ 7] 5.00-6.00 sec  4.77 GBytes 40.9 Gbits/sec  0  8.08 MBytes
[ 7] 6.00-7.00 sec  5.48 GBytes 47.0 Gbits/sec  0  8.08 MBytes
[ 7] 7.00-8.00 sec  5.70 GBytes 48.9 Gbits/sec  0  8.08 MBytes
[ 7] 8.00-9.00 sec  5.66 GBytes 48.6 Gbits/sec  0  8.08 MBytes
[ 7] 9.00-10.00 sec 5.62 GBytes 48.3 Gbits/sec  0  8.08 MBytes
[ 7] 10.00-10.00 sec 3.38 MBytes 20.4 Gbits/sec
-----
[ ID] Interval      Transfer    Bitrate    Retr  Cwnd
[ 7] 0.00-10.00 sec 52.7 GBytes 45.3 Gbits/sec  0

Server listening on 5201
```

Ход работы

```
*** Starting GNI:
mininet> h2 iperf3 -s &
mininet> h1 iperf3 -c h2
Connecting to host 10.0.0.2, port 5201
[ S] local 10.0.0.1 port 53422 connected to 10.0.0.2 port 5201
[ ID] Interval      Transfer    Bitrate    Retr  Cwnd
[ S]  0.00-1.00    sec  5.41 GBytes  46.5 Gbits/sec    9   20.1 MBytes
[ S]  1.00-2.00    sec  5.73 GBytes  49.2 Gbits/sec    0   20.1 MBytes
[ S]  2.00-3.00    sec  4.98 GBytes  42.8 Gbits/sec    0   20.1 MBytes
[ S]  3.00-4.00    sec  4.85 GBytes  41.7 Gbits/sec    0   20.1 MBytes
[ S]  4.00-5.00    sec  5.21 GBytes  44.7 Gbits/sec    0   20.1 MBytes
[ S]  5.00-6.00    sec  5.70 GBytes  49.0 Gbits/sec    0   20.1 MBytes
[ S]  6.00-7.00    sec  6.32 GBytes  54.3 Gbits/sec    0   20.1 MBytes
[ S]  7.00-8.00    sec  7.00 GBytes  60.1 Gbits/sec    0   20.1 MBytes
[ S]  8.00-9.00    sec  6.98 GBytes  60.0 Gbits/sec    0   20.1 MBytes
[ S]  9.00-10.00   sec  7.01 GBytes  60.2 Gbits/sec    0   20.1 MBytes
- - - - -
[ ID] Interval      Transfer    Bitrate    Retr
[ S]  0.00-10.00   sec  59.2 GBytes  50.8 Gbits/sec    9          sender
[ S]  0.00-10.00   sec  59.2 GBytes  50.8 Gbits/sec          receiver

iperf Done.
mininet>
```

et-vm:/home/mininet#

```
New release '22.04.5 LTS' available!
Run 'do-release-upgrade' to upgrade to it.

Last login: Sat Nov 23 07:49:35 PM UTC 2024 from 10.0.0.1
mininet@mininet-vm:~$ ifconfig
eth0: flags=4163<UP,BROADCAST,RUNNING,NOARP>
    inet 10.0.3.15 netmask 255.255.255.0
    ether 08:00:27:af:06:41
    RX packets 20 bytes 3334 (3.3 KB)
    RX errors 0 dropped 0 overruns 0
    TX packets 23 bytes 2546 (2.5 KB)
    TX errors 0 dropped 0 overruns 0

eth1: flags=4163<UP,BROADCAST,RUNNING,NOARP>
    inet 192.168.56.101 netmask 255.255.255.0
    ether 08:00:27:46:77:7e
    RX packets 2 bytes 1180 (1.1 KB)
    RX errors 0 dropped 0 overruns 0
    TX packets 2 bytes 684 (684 B)
    TX errors 0 dropped 0 overruns 0
```

host: h2" @mininet-vm

root@mininet-vm:/home/mininet#

Ход работы

```
root@h1:~# iperf3 -h
--username            username for authentication
--rsa-public-key-path  path to the RSA public key used to encrypt
                        authentication credentials

[KMG] indicates options that support a K/M/G suffix for kilo-, mega-, or giga-

iperf3 homepage at: https://software.es.net/iperf/
Report bugs to: https://github.com/esnet/iperf
root@mininet-vm:/home/mininet# iperf3 -c 10.0.0.2 -t 5
Connecting to host 10.0.0.2, port 5201
[ 7] local 10.0.0.1 port 53426 connected to 10.0.0.2 port 5201
[ ID] Interval      Transfer    Bitrate      Retr  Cwnd
[ 7] 0.00-1.00 sec  4.88 GBytes  41.9 Gbits/sec  0    8.09 MBytes
[ 7] 1.00-2.00 sec  5.36 GBytes  46.0 Gbits/sec  0    8.09 MBytes
[ 7] 2.00-3.00 sec  5.66 GBytes  48.6 Gbits/sec  0    8.09 MBytes
[ 7] 3.00-4.00 sec  5.61 GBytes  48.3 Gbits/sec  0    8.09 MBytes
[ 7] 4.00-5.00 sec  5.21 GBytes  44.7 Gbits/sec  0    8.09 MBytes
- - - - -
[ ID] Interval      Transfer    Bitrate      Retr  sender
[ 7] 0.00-5.00 sec  26.7 GBytes  45.9 Gbits/sec  0
[ 7] 0.00-5.00 sec  26.7 GBytes  45.9 Gbits/sec  1 receiver

iperf Done.
root@mininet-vm:/home/mininet#
```

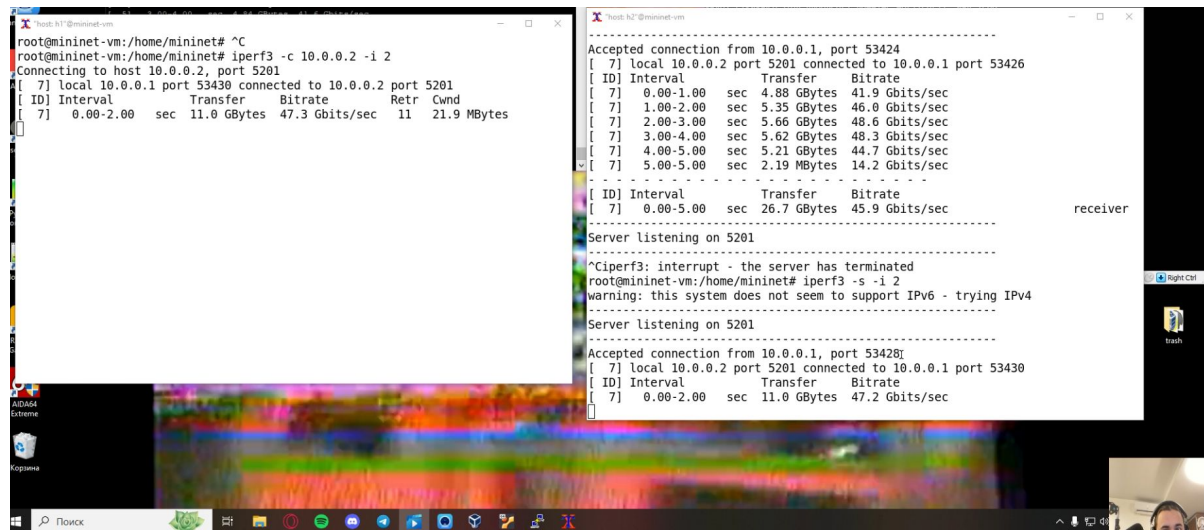
```
root@mininet-vm:/home/mininet# iperf3 -s
warning: this system does not seem to support IPv6 - trying IPv4
Server listening on 5201
Accepted connection from 10.0.0.1, port 53424
[ 7] local 10.0.0.2 port 5201 connected to 10.0.0.1 port 53426
[ ID] Interval      Transfer    Bitrate
[ 7] 0.00-1.00 sec  4.88 GBytes  41.9 Gbits/sec
[ 7] 1.00-2.00 sec  5.35 GBytes  46.0 Gbits/sec
[ 7] 2.00-3.00 sec  5.66 GBytes  48.6 Gbits/sec
[ 7] 3.00-4.00 sec  5.62 GBytes  48.3 Gbits/sec
[ 7] 4.00-5.00 sec  5.21 GBytes  44.7 Gbits/sec
[ 7] 5.00-5.00 sec  2.19 MBytes  14.2 Gbits/sec
- - - - -
[ ID] Interval      Transfer    Bitrate
[ 7] 0.00-5.00 sec  26.7 GBytes  45.9 Gbits/sec

Server listening on 5201
[ 7] 0.00-5.00 sec  26.7 GBytes  45.9 Gbits/sec

receiver
```

Now i wonder

Ход работы

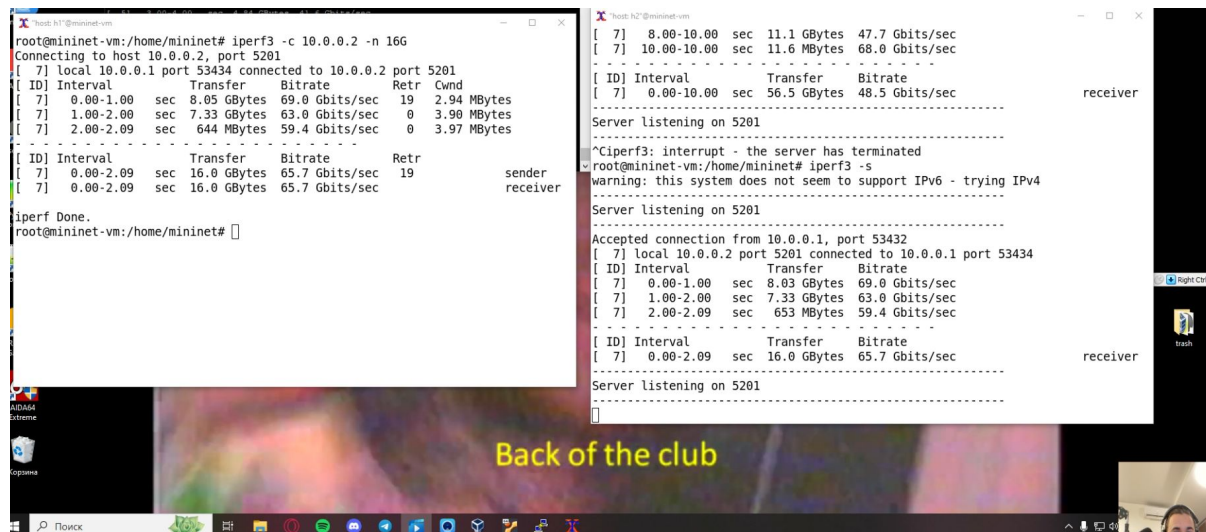


```
root@mininet-vm:/home/mininet# ^C
root@mininet-vm:/home/mininet# iperf3 -c 10.0.0.2 -i 2
Connecting to host 10.0.0.2, port 5201
[ 7] local 10.0.0.1 port 53430 connected to 10.0.0.2 port 5201
[ ID] Interval      Transfer    Bitrate    Retr    Cwnd
[ 7] 0.00-2.00 sec  11.0 GBytes  47.3 Gbits/sec  11      21.9 MBytes

root@mininet-vm:/home/mininet-vm
root@mininet-vm

Accepted connection from 10.0.0.1, port 53424
[ 7] local 10.0.0.2 port 5201 connected to 10.0.0.1 port 53426
[ ID] Interval      Transfer    Bitrate
[ 7] 0.00-1.00 sec  4.88 GBytes  41.9 Gbits/sec
[ 7] 1.00-2.00 sec  5.35 GBytes  46.0 Gbits/sec
[ 7] 2.00-3.00 sec  5.66 GBytes  48.6 Gbits/sec
[ 7] 3.00-4.00 sec  5.62 GBytes  48.3 Gbits/sec
[ 7] 4.00-5.00 sec  5.21 GBytes  44.7 Gbits/sec
[ 7] 5.00-5.00 sec  2.19 MBytes  14.2 Gbits/sec
-----
[ ID] Interval      Transfer    Bitrate
[ 7] 0.00-5.00 sec  26.7 GBytes  45.9 Gbits/sec
-----
Server listening on 5201
-----
^Ciperf3: interrupt - the server has terminated
root@mininet-vm:/home/mininet# iperf3 -s -i 2
warning: this system does not seem to support IPv6 - trying IPv4
-----
Server listening on 5201
-----
Accepted connection from 10.0.0.1, port 53428
[ 7] local 10.0.0.2 port 5201 connected to 10.0.0.1 port 53430
[ ID] Interval      Transfer    Bitrate
[ 7] 0.00-2.00 sec  11.0 GBytes  47.2 Gbits/sec
```

Ход работы



```
root@mininet-vm:/home/mininet# iperf3 -c 10.0.0.2 -n 16G
Connecting to host 10.0.0.2, port 5201
[ 7] local 10.0.0.1 port 53434 connected to 10.0.0.2 port 5201
[ ID] Interval      Transfer    Bitrate      Retr  Cwnd
[ 7] 0.00-1.00 sec   8.05 GBytes 69.0 Gbits/sec  19   2.94 MBytes
[ 7] 1.00-2.00 sec   7.33 GBytes 63.0 Gbits/sec   0   3.90 MBytes
[ 7] 2.00-2.09 sec   644 MBytes 59.4 Gbits/sec   0   3.97 MBytes
-----
[ ID] Interval      Transfer    Bitrate      Retr
[ 7] 0.00-2.09 sec   16.0 GBytes 65.7 Gbits/sec  19
[ 7] 0.00-2.09 sec   16.0 GBytes 65.7 Gbits/sec
iperf Done.
root@mininet-vm:/home/mininet#
```

```
root@mininet-vm:/home/mininet# iperf3 -s
warning: this system does not seem to support IPv6 - trying IPv4
Server listening on 5201
-----
Accepted connection from 10.0.0.1, port 53432
[ 7] local 10.0.0.2 port 5201 connected to 10.0.0.1 port 53432
[ ID] Interval      Transfer    Bitrate      Retr
[ 7] 0.00-1.00 sec   8.03 GBytes 69.0 Gbits/sec   0
[ 7] 1.00-2.00 sec   7.33 GBytes 63.0 Gbits/sec   0
[ 7] 2.00-2.09 sec   653 MBytes 59.4 Gbits/sec   0
-----
[ ID] Interval      Transfer    Bitrate
[ 7] 0.00-2.09 sec   16.0 GBytes 65.7 Gbits/sec
Server listening on 5201
```

Ход работы

```
root@mininet-vm:/home/mininet# iperf3 -c 10.0.0.2 -u
Connecting to host 10.0.0.2, port 5201
[ 7] local 10.0.0.1 port 51482 connected to 10.0.0.2 port 5201
[ ID] Interval      Transfer    Bitrate        Total Datagrams
[ 7] 0.00-1.00 sec   129 KBytes  1.05 Mbits/sec  91
[ 7] 1.00-2.00 sec   127 KBytes  1.04 Mbits/sec  90
[ 7] 2.00-3.00 sec   129 KBytes  1.05 Mbits/sec  91
[ 7] 3.00-4.00 sec   127 KBytes  1.04 Mbits/sec  90
[ 7] 4.00-5.00 sec   129 KBytes  1.05 Mbits/sec  91
[ 7] 5.00-6.00 sec   129 KBytes  1.05 Mbits/sec  91
[ 7] 6.00-7.00 sec   127 KBytes  1.04 Mbits/sec  90
[ 7] 7.00-8.00 sec   129 KBytes  1.05 Mbits/sec  91
[ 7] 8.00-9.00 sec   127 KBytes  1.04 Mbits/sec  90
[ 7] 9.00-10.00 sec  129 KBytes  1.05 Mbits/sec  91
-----
[ ID] Interval      Transfer    Bitrate        Jitter    Lost/Total Datagrams
[ 7] 0.00-10.00 sec  1.25 MBytes  1.05 Mbits/sec  0.000 ms  0/906 (0%) sender
[ 7] 0.00-10.00 sec  1.25 MBytes  1.05 Mbits/sec  0.002 ms  0/906 (0%) receiver
iperf Done.
root@mininet-vm:/home/mininet#
```

```
host: h2@mininet-vm
warning: this system does not seem to support IPv6 - trying IPv4
Server listening on 5201
-----
Accepted connection from 10.0.0.1, port 53436
[ 7] local 10.0.0.2 port 5201 connected to 10.0.0.1 port 51482
[ ID] Interval      Transfer    Bitrate        Jitter    Lost/Total Datagrams
[ 7] 0.00-1.00 sec   129 KBytes  1.05 Mbits/sec  0.002 ms  0/91 (0%)
[ 7] 1.00-2.00 sec   127 KBytes  1.04 Mbits/sec  0.001 ms  0/90 (0%)
[ 7] 2.00-3.00 sec   129 KBytes  1.05 Mbits/sec  0.002 ms  0/91 (0%)
[ 7] 3.00-4.00 sec   127 KBytes  1.04 Mbits/sec  0.002 ms  0/90 (0%)
[ 7] 4.00-5.00 sec   129 KBytes  1.05 Mbits/sec  0.001 ms  0/91 (0%)
[ 7] 5.00-6.00 sec   129 KBytes  1.05 Mbits/sec  0.002 ms  0/91 (0%)
[ 7] 6.00-7.00 sec   127 KBytes  1.04 Mbits/sec  0.002 ms  0/90 (0%)
[ 7] 7.00-8.00 sec   129 KBytes  1.05 Mbits/sec  0.002 ms  0/91 (0%)
[ 7] 8.00-9.00 sec   127 KBytes  1.04 Mbits/sec  0.002 ms  0/90 (0%)
[ 7] 9.00-10.00 sec  129 KBytes  1.05 Mbits/sec  0.002 ms  0/91 (0%)
-----
[ ID] Interval      Transfer    Bitrate        Jitter    Lost/Total Datagrams
[ 7] 0.00-10.00 sec  1.25 MBytes  1.05 Mbits/sec  0.002 ms  0/906 (0%) receiver
Server listening on 5201
```

gettin sucked

Ход работы

```
root@mininet-vm:/home/mininet# iperf
iperf Done.
root@mininet-vm:/home/mininet# iperf3 -c 10.0.0.2 -p 3250
Connecting to host 10.0.0.2, port 3250
[ 7] local 10.0.0.1 port 46494 connected to 10.0.0.2 port 3250
[ ID] Interval      Transfer    Bitrate      Retr    Cwnd
[ 7] 0.00-1.00 sec  5.33 GBytes 45.8 Gbits/sec  0      8.32 MBytes
[ 7] 1.00-2.00 sec  5.55 GBytes 47.6 Gbits/sec  0      8.32 MBytes
[ 7] 2.00-3.00 sec  5.12 GBytes 44.0 Gbits/sec  0      8.32 MBytes
[ 7] 3.00-4.00 sec  5.24 GBytes 45.1 Gbits/sec  0      8.32 MBytes
[ 7] 4.00-5.00 sec  5.29 GBytes 45.4 Gbits/sec  0      8.32 MBytes
[ 7] 5.00-6.00 sec  5.40 GBytes 46.4 Gbits/sec  0      8.32 MBytes
[ 7] 6.00-7.00 sec  4.94 GBytes 42.4 Gbits/sec  0      8.32 MBytes
[ 7] 7.00-8.00 sec  5.21 GBytes 44.8 Gbits/sec  0      8.32 MBytes
[ 7] 8.00-9.00 sec  5.65 GBytes 48.6 Gbits/sec  0      8.32 MBytes
[ 7] 9.00-10.00 sec 5.61 GBytes 48.2 Gbits/sec  0      8.32 MBytes
-----
[ ID] Interval      Transfer    Bitrate      Retr    sender receiver
[ 7] 0.00-10.00 sec 53.3 GBytes 45.8 Gbits/sec  0
[ 7] 0.00-10.00 sec 53.3 GBytes 45.8 Gbits/sec

iperf Done.
root@mininet-vm:/home/mininet#
```

```
root@mininet-vm:/home/mininet# iperf3 -s -p 3250
warning: this system does not seem to support IPv6 - trying IPv4
Server listening on 3250
-----
Accepted connection from 10.0.0.1, port 46492
[ 7] local 10.0.0.2 port 3250 connected to 10.0.0.1 port 46494
[ ID] Interval      Transfer    Bitrate
[ 7] 0.00-1.00 sec  5.32 GBytes 45.7 Gbits/sec
[ 7] 1.00-2.00 sec  5.55 GBytes 47.7 Gbits/sec
[ 7] 2.00-3.00 sec  5.12 GBytes 44.0 Gbits/sec
[ 7] 3.00-4.00 sec  5.25 GBytes 45.1 Gbits/sec
[ 7] 4.00-5.00 sec  5.29 GBytes 45.4 Gbits/sec
[ 7] 5.00-6.00 sec  5.40 GBytes 46.4 Gbits/sec
[ 7] 6.00-7.00 sec  4.93 GBytes 42.4 Gbits/sec
[ 7] 7.00-8.00 sec  5.21 GBytes 44.7 Gbits/sec
[ 7] 8.00-9.00 sec  5.65 GBytes 48.6 Gbits/sec
[ 7] 9.00-10.00 sec 5.61 GBytes 48.2 Gbits/sec
[ 7] 10.00-10.00 sec 3.31 MBytes 23.0 Gbits/sec
-----
[ ID] Interval      Transfer    Bitrate
[ 7] 0.00-10.00 sec 53.3 GBytes 45.8 Gbits/sec
Server listening on 3250
```

Ход работы

```
host h1@mininet-vm
iperf Done.
root@mininet-vm:/home/mininet# iperf3 -c 10.0.0.2
Connecting to host 10.0.0.2, port 5201
[ 7] local 10.0.0.1 port 53444 connected to 10.0.0.2 port 5201
[ ID] Interval      Transfer    Bitrate    Retr  Cwnd
[ 7] 0.00-1.00 sec  5.29 GBytes 45.4 Gbits/sec  0    8.08 MBytes
[ 7] 1.00-2.00 sec  5.62 GBytes 48.3 Gbits/sec  0    8.08 MBytes
[ 7] 2.00-3.00 sec  5.59 GBytes 48.0 Gbits/sec  0    8.08 MBytes
[ 7] 3.00-4.00 sec  5.58 GBytes 48.0 Gbits/sec  0    8.08 MBytes
[ 7] 4.00-5.00 sec  5.65 GBytes 48.5 Gbits/sec  0    8.08 MBytes
[ 7] 5.00-6.00 sec  5.26 GBytes 45.2 Gbits/sec  0    8.08 MBytes
[ 7] 6.00-7.00 sec  5.64 GBytes 48.4 Gbits/sec  0    8.08 MBytes
[ 7] 7.00-8.00 sec  5.69 GBytes 48.9 Gbits/sec  0    8.08 MBytes
[ 7] 8.00-9.00 sec  5.73 GBytes 49.1 Gbits/sec  0    8.08 MBytes
[ 7] 9.00-10.00 sec 5.71 GBytes 49.1 Gbits/sec  0    8.08 MBytes
-----
[ ID] Interval      Transfer    Bitrate    Retr  sender receiver
[ 7] 0.00-10.00 sec 55.8 GBytes 47.9 Gbits/sec  0
[ 7] 0.00-10.00 sec 55.8 GBytes 47.9 Gbits/sec  0

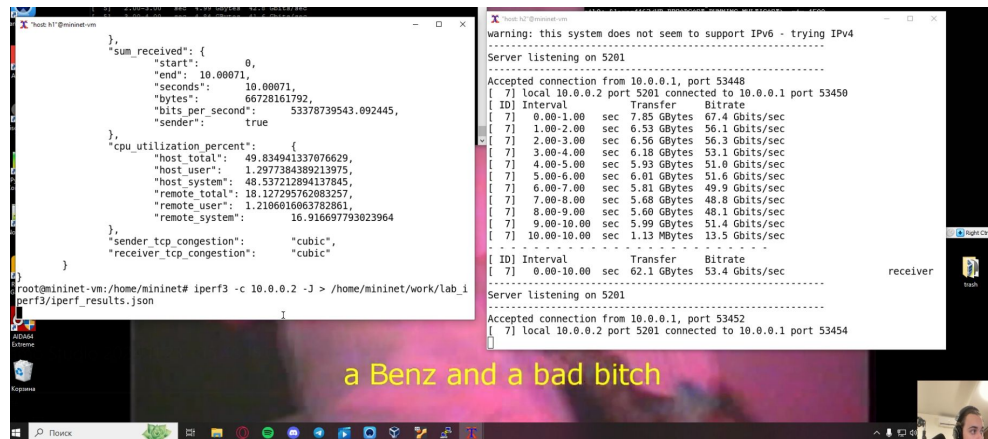
iperf Done.
root@mininet-vm:/home/mininet# iperf3 -c 10.0.0.2
iperf3: error - unable to connect to server: Connection refused
root@mininet-vm:/home/mininet#
```

```
host h2@mininet-vm
-----
Server Listening on 3250
-----
^Ciperf3: interrupt - the server has terminated
root@mininet-vm:/home/mininet# iperf3 -s -l
warning: this system does not seem to support IPv6 - trying IPv4
Server listening on 5201
-----
Accepted connection from 10.0.0.1, port 53442
[ 7] local 10.0.0.2 port 5201 connected to 10.0.0.1 port 53444
[ ID] Interval      Transfer    Bitrate
[ 7] 0.00-1.00 sec  5.27 GBytes 45.3 Gbits/sec
[ 7] 1.00-2.00 sec  5.62 GBytes 48.3 Gbits/sec
[ 7] 2.00-3.00 sec  5.59 GBytes 48.0 Gbits/sec
[ 7] 3.00-4.00 sec  5.59 GBytes 48.1 Gbits/sec
[ 7] 4.00-5.00 sec  5.65 GBytes 48.5 Gbits/sec
[ 7] 5.00-6.00 sec  5.27 GBytes 45.2 Gbits/sec
[ 7] 6.00-7.00 sec  5.63 GBytes 48.3 Gbits/sec
[ 7] 7.00-8.00 sec  5.70 GBytes 49.0 Gbits/sec
[ 7] 8.00-9.00 sec  5.72 GBytes 49.1 Gbits/sec
[ 7] 9.00-10.00 sec 5.71 GBytes 49.1 Gbits/sec
[ 7] 10.00-10.00 sec 12.2 MBytes 90.6 Gbits/sec
-----
[ ID] Interval      Transfer    Bitrate
[ 7] 0.00-10.00 sec 55.8 GBytes 47.9 Gbits/sec
root@mininet-vm:/home/mininet#
```

receiver

Everyone afraid of my lifestyle

Ход работы



```
},
  "sum_received": {
    "start": 0,
    "end": 10.00071,
    "seconds": 10.00071,
    "bytes": 66728161792,
    "bits_per_second": 53378739543.092445,
    "sender": true
  },
  "cpu_utilization_percent": {
    "host_total": 49.834941337076629,
    "host_user": 1.2977384389213975,
    "host_system": 48.537212894137845,
    "remote_total": 18.127295762083257,
    "remote_user": 1.2106016063782861,
    "remote_system": 16.916697793023964
  },
  "sender_tcp_congestion": "cubic",
  "receiver_tcp_congestion": "cubic"
}
}
root@mininet-vm:/home/mininet# iperf3 -c 10.0.0.2 -J > /home/mininet/work/lab_1
iperf3/iperf_results.json
```

```
warning: this system does not seem to support IPv6 - trying IPv4
Server Listening on 5201
Accepted connection from 10.0.0.1, port 53448
[ 7] local 10.0.0.2 port 5201 connected to 10.0.0.1 port 53450
[ ID] Interval      Transfer    Bitrate
[ 7] 0.00-1.00 sec  7.85 GBytes  67.4 Gbits/sec
[ 7] 1.00-2.00 sec  6.53 GBytes  56.1 Gbits/sec
[ 7] 2.00-3.00 sec  6.56 GBytes  56.3 Gbits/sec
[ 7] 3.00-4.00 sec  6.10 GBytes  53.1 Gbits/sec
[ 7] 4.00-5.00 sec  5.93 GBytes  51.0 Gbits/sec
[ 7] 5.00-6.00 sec  6.01 GBytes  51.6 Gbits/sec
[ 7] 6.00-7.00 sec  5.81 GBytes  49.9 Gbits/sec
[ 7] 7.00-8.00 sec  5.60 GBytes  48.0 Gbits/sec
[ 7] 8.00-9.00 sec  5.60 GBytes  48.1 Gbits/sec
[ 7] 9.00-10.00 sec 5.99 GBytes  51.4 Gbits/sec
[ 7] 10.00-10.00 sec 1.13 MBytes  13.5 Gbits/sec
[ ID] Interval      Transfer    Bitrate
[ 7] 0.00-10.00 sec 62.1 GBytes  53.4 Gbits/sec
Server Listening on 5201
Accepted connection from 10.0.0.1, port 53452
[ 7] local 10.0.0.2 port 5201 connected to 10.0.0.1 port 53454
```

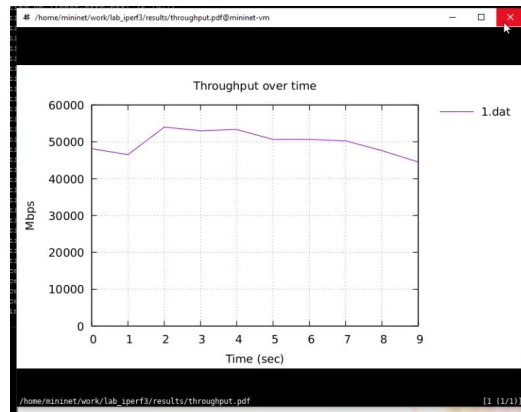
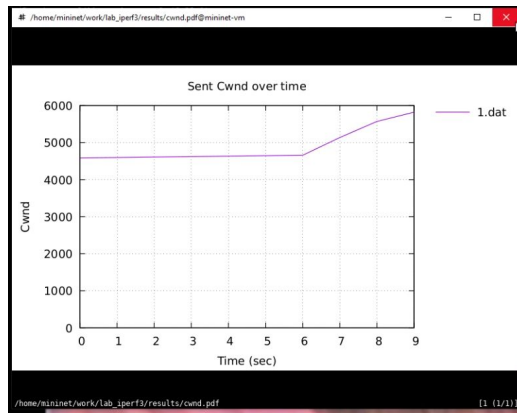
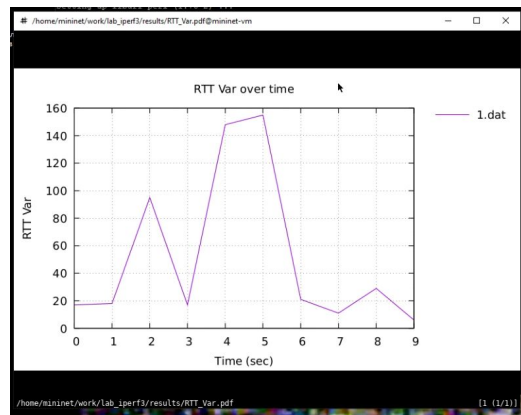
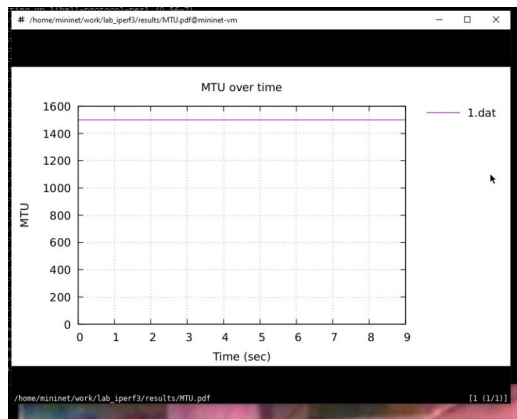
a Benz and a bad bitch



Ход работы

```
mininet@mininet-vm:~/work/lab_iperf3$ sudo apt-get install -y zathura
Reading package lists... Done
Building dependency tree
Reading state information... Done
```

Ход работы





Вывод

Я ознакомился с инструментом для измерения пропускной способности сети в режиме реального времени — **iPerf3**, а также получил навыки проведения интерактивного эксперимента по измерению пропускной способности моделируемой сети в среде **Mininet**.