

ФЕДЕРАЛЬНОЕ АГЕНТСТВО СВЯЗИ
ФЕДЕРАЛЬНОЕ ГОСУДАРСТВЕННОЕ БЮДЖЕТНОЕ ОБРАЗОВАТЕЛЬНОЕ
УЧРЕЖДЕНИЕ ВЫСШЕГО ОБРАЗОВАНИЯ
«САНКТ-ПЕТЕРБУРГСКИЙ ГОСУДАРСТВЕННЫЙ УНИВЕРСИТЕТ
ТЕЛЕКОММУНИКАЦИЙ ИМ. ПРОФ. М.А. БОНЧ-БРУЕВИЧА»
(СПбГУТ)

Факультет Инфокоммуникационных сетей и систем

Кафедра Защищенных систем связи

Лабораторная работа №6
НАСТРОЙКА МЕЖСЕТЕВОГО ЭКРАНА

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(подпись)

Санкт-Петербург

2020

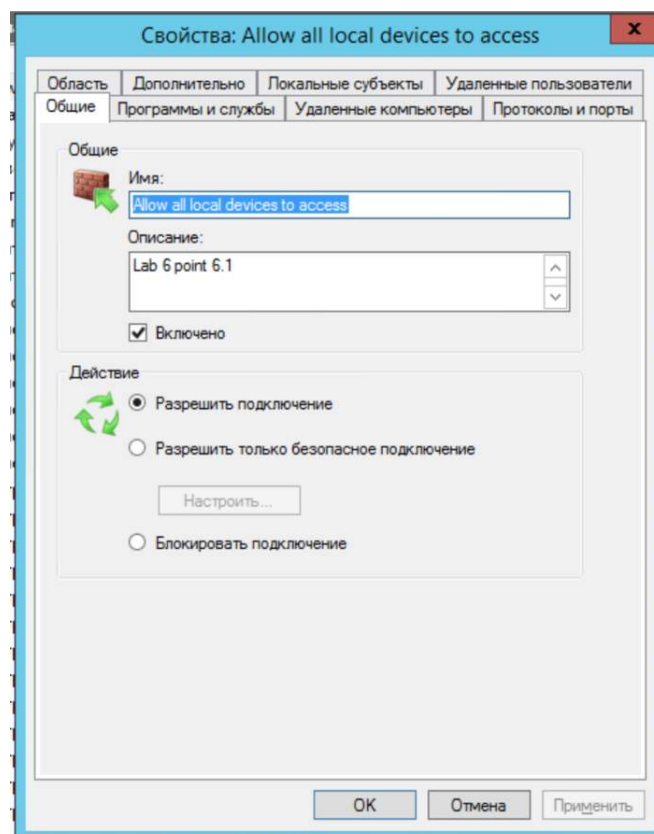
Цель лабораторной работы:

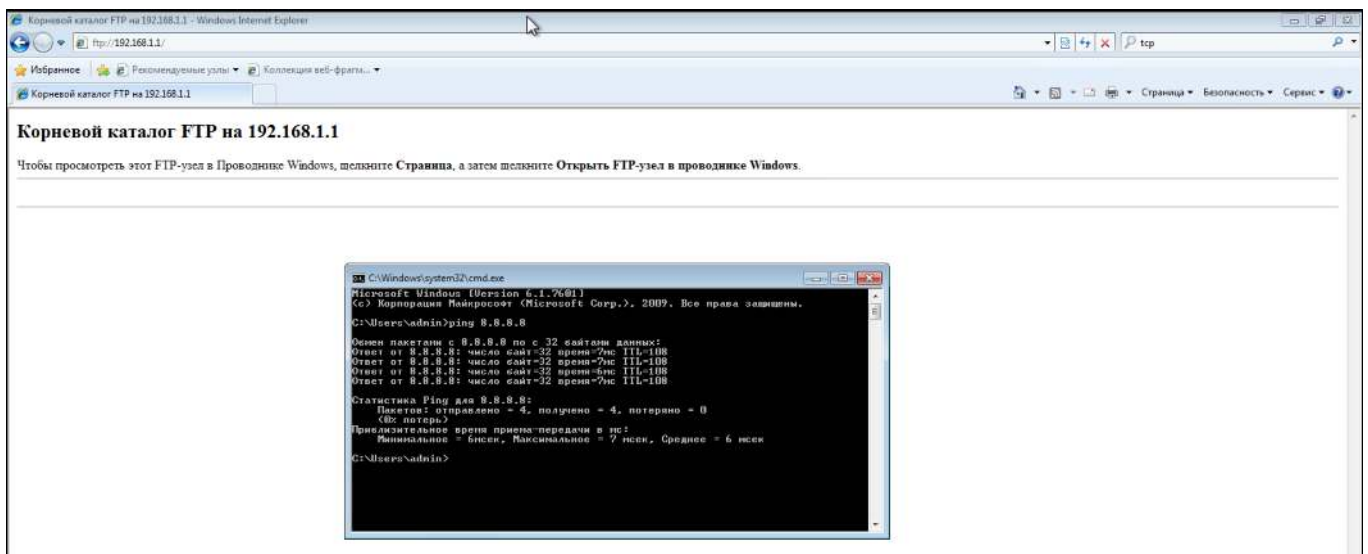
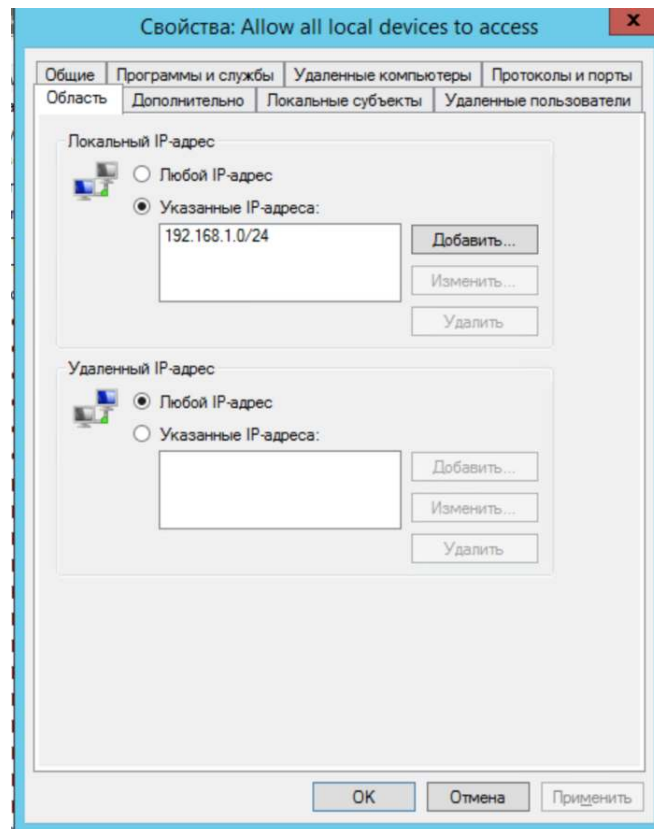
1. Ознакомиться с межсетевым экраном "Windows Firewall".
2. Ознакомиться с типами сетей: "Доменные", "Частные", "Общественные".
3. Научиться настраивать правила.

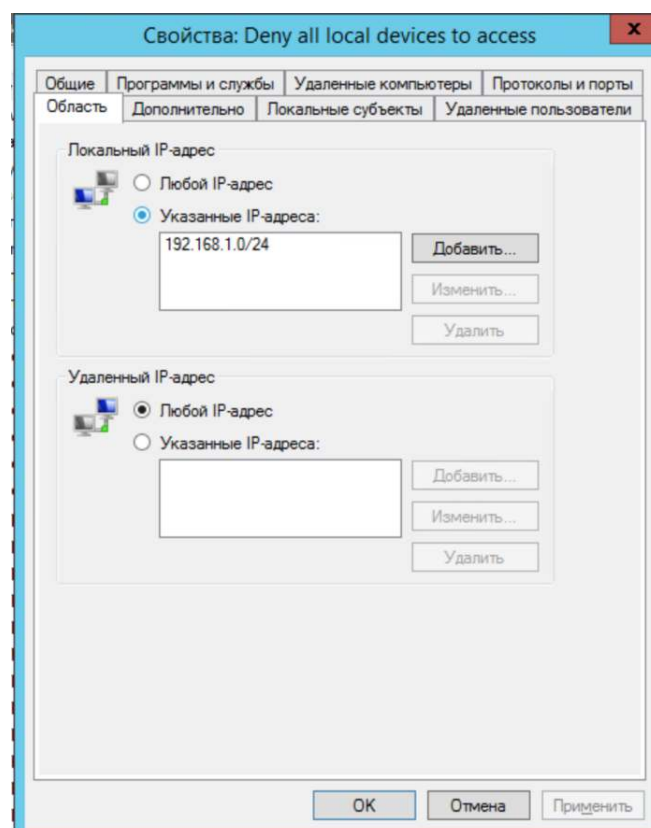
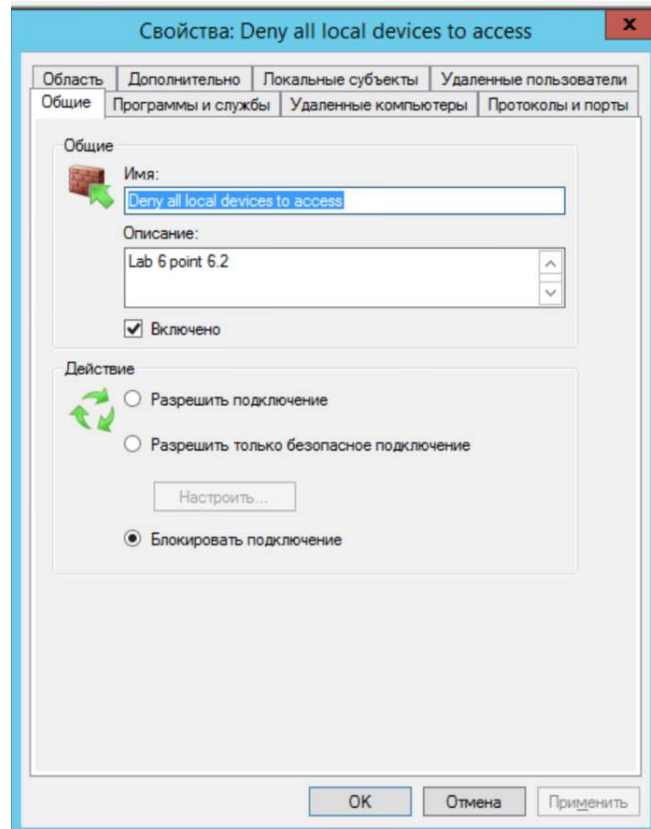
Схема сети:

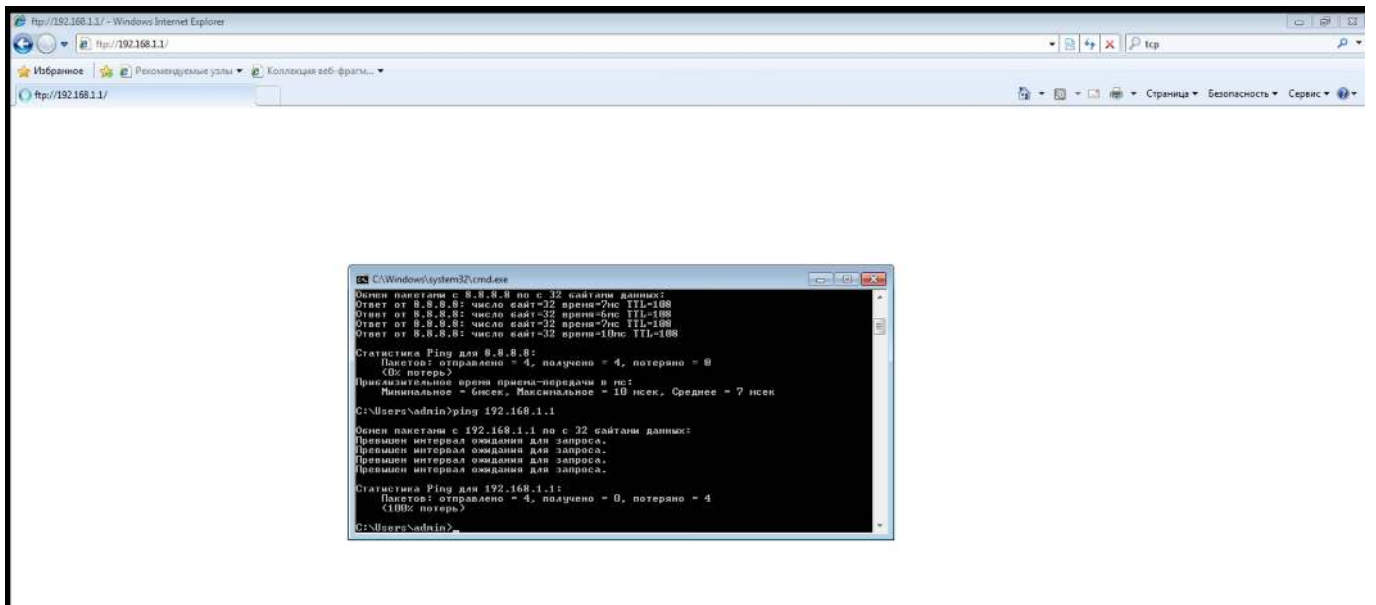


пункт 6

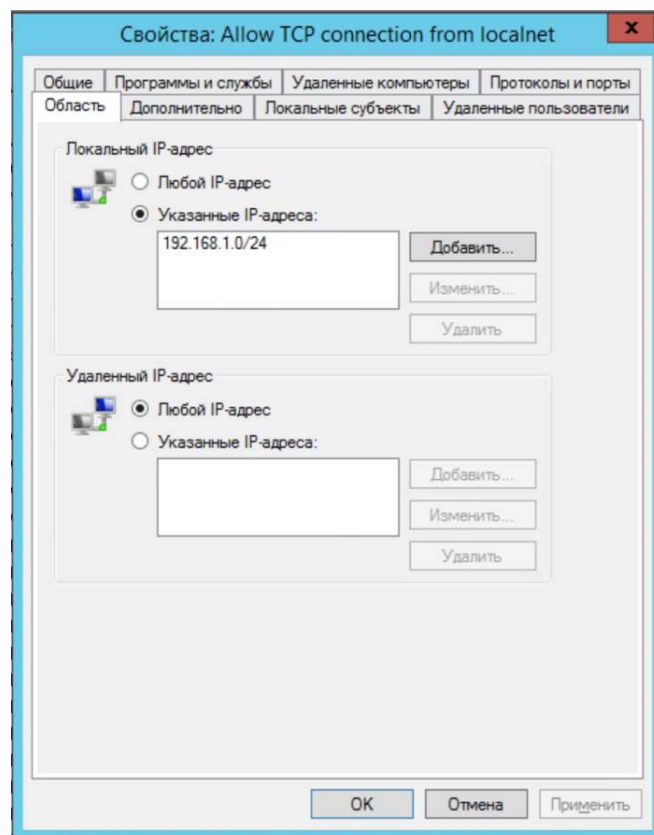
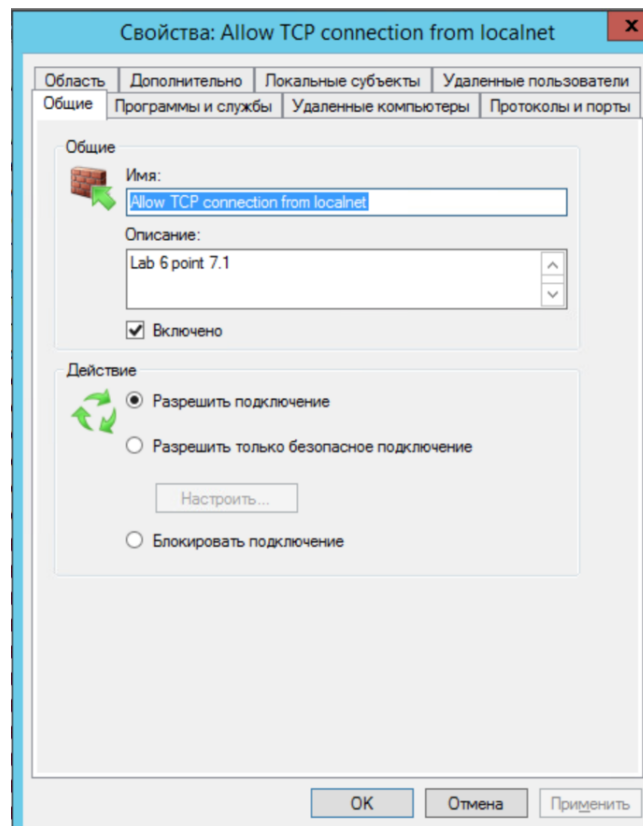








пункт 7



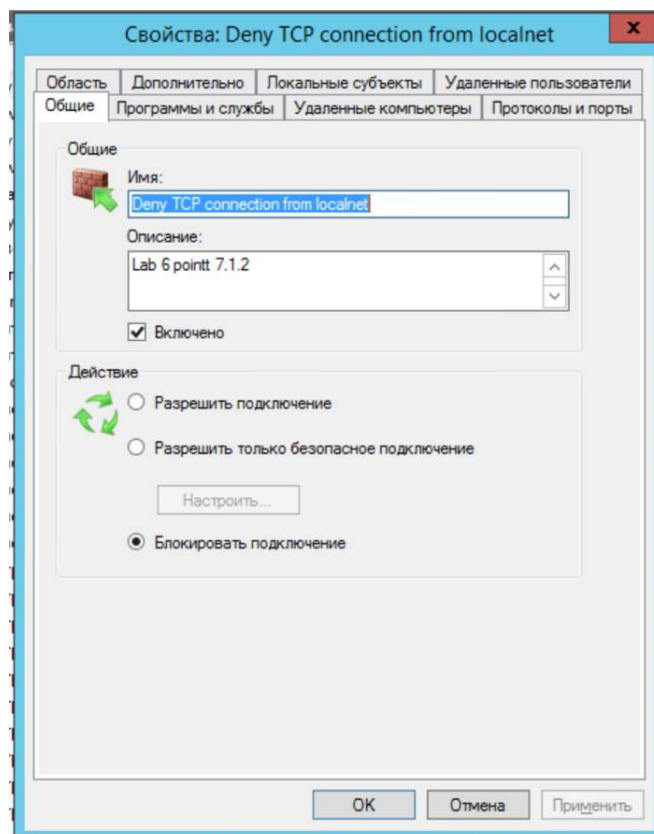
```
C:\Windows\system32\cmd.exe

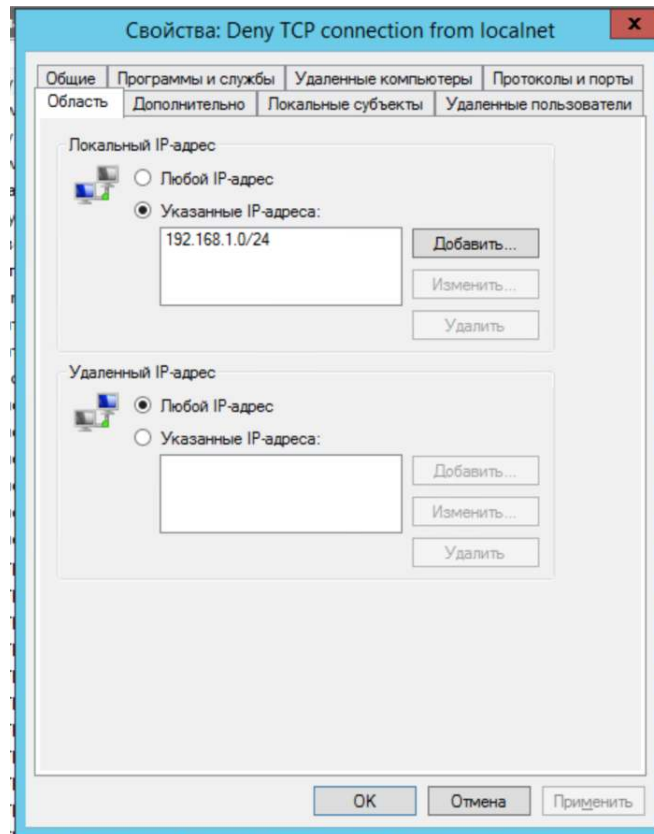
: ephemeral port>
-P, --parallel #          number of parallel client streams to run
-R, --reverse           run in reverse mode (server sends, client receives)
-w, --window #[KMG]     set window size / socket buffer size
-M, --set-mss #         set TCP/SCIP maximum segment size (MTU - 40 bytes)
-N, --no-delay          set TCP/SCIP no delay, disabling Nagle's Algorithm
-4, --version4          only use IPv4
-6, --version6          only use IPv6
-S, --tos N             set the IP 'type of service'
-Z, --zerocopy          use a 'zero copy' method of sending data
-O, --omit N            omit the first n seconds
-T, --title str         prefix every output line with this string
--get-server-output     get results from server
--udp-counters-64bit    use 64-bit counters in UDP test packets

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

iperf3 homepage at: http://software.es.net/iperf/
Report bugs to: https://github.com/esnet/iperf

C:\Users\admin\Desktop\iperf-3.1.3-win64>iperf3.exe -c 192.168.1.1
Connecting to host 192.168.1.1, port 5201
[ 4] local 192.168.1.5 port 49365 connected to 192.168.1.1 port 5201
[ ID] Interval      Transfer      Bandwidth
[ 4] 0.00-1.01 sec  359 MBytes  2.97 Gbits/sec
[ 4] 1.01-2.01 sec  382 MBytes  3.21 Gbits/sec
[ 4] 2.01-3.01 sec  403 MBytes  3.38 Gbits/sec
[ 4] 3.01-4.01 sec  410 MBytes  3.45 Gbits/sec
[ 4] 4.01-5.01 sec  362 MBytes  3.04 Gbits/sec
[ 4] 5.01-6.01 sec  321 MBytes  2.69 Gbits/sec
[ 4] 6.01-7.00 sec  358 MBytes  3.01 Gbits/sec
[ 4] 7.00-8.00 sec  285 MBytes  2.40 Gbits/sec
[ 4] 8.00-9.00 sec  277 MBytes  2.33 Gbits/sec
[ 4] 9.00-9.34 sec  140 MBytes  3.43 Gbits/sec
[ ID] Interval      Transfer      Bandwidth
[ 4] 0.00-9.34 sec  3.22 GBytes  2.96 Gbits/sec
[ 4] 0.00-9.34 sec  0.00 Bytes  0.00 bits/sec
iperf3: interrupt - the client has terminated
C:\Users\admin\Desktop\iperf-3.1.3-win64>
```





```
C:\Windows\system32\cmd.exe - iperf3.exe -c 192.168.1.1

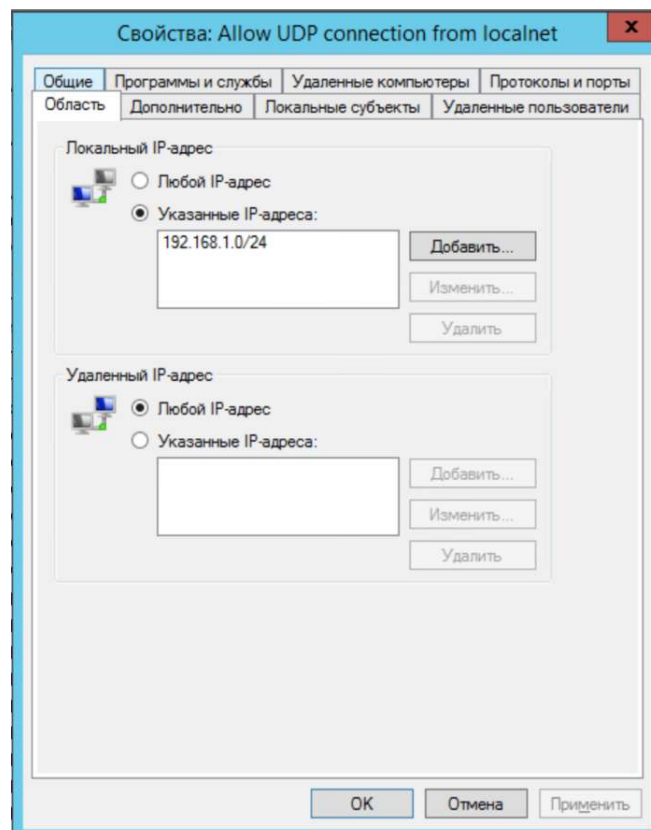
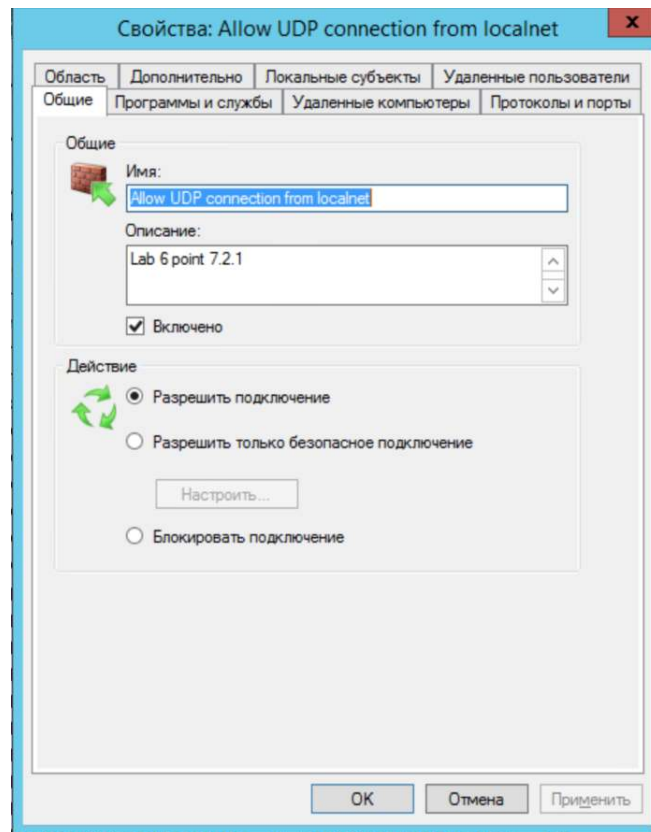
-6, --version6          only use IPv6
-S, --tos N             set the IP 'type of service'
-Z, --zerocopy          use a 'zero copy' method of sending data
-O, --omit N            omit the first n seconds
-T, --title str         prefix every output line with this string
--get-server-output     get results from server
--udp-counters-64bit    use 64-bit counters in UDP test packets

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

iperf3 homepage at:  http://software.es.net/iperf/
Report bugs to:      https://github.com/esnet/iperf

C:\Users\admin\Desktop\iperf-3.1.3-win64>iperf3.exe -c 192.168.1.1
Connecting to host 192.168.1.1, port 5201
[ 41] local 192.168.1.5 port 49365 connected to 192.168.1.1 port 5201
[ ID] Interval           Transfer     Bandwidth
[ 41] 0.00-1.01 sec      359 MBytes  2.97 Gbits/sec
[ 41] 1.01-2.01 sec      382 MBytes  3.21 Gbits/sec
[ 41] 2.01-3.01 sec      403 MBytes  3.38 Gbits/sec
[ 41] 3.01-4.01 sec      410 MBytes  3.45 Gbits/sec
[ 41] 4.01-5.01 sec      362 MBytes  3.04 Gbits/sec
[ 41] 5.01-6.01 sec      321 MBytes  2.69 Gbits/sec
[ 41] 6.01-7.00 sec      358 MBytes  3.01 Gbits/sec
[ 41] 7.00-8.00 sec      285 MBytes  2.40 Gbits/sec
[ 41] 8.00-9.00 sec      277 MBytes  2.33 Gbits/sec
[ 41] 9.00-9.34 sec      140 MBytes  3.43 Gbits/sec
- - - - -
[ ID] Interval           Transfer     Bandwidth
[ 41] 0.00-9.34 sec      3.22 GBytes  2.96 Gbits/sec
[ 41] 0.00-9.34 sec      0.00 Bytes   0.00 bits/sec
iperf3: interrupt - the client has terminated

C:\Users\admin\Desktop\iperf-3.1.3-win64>iperf3.exe -c 192.168.1.1
-
```

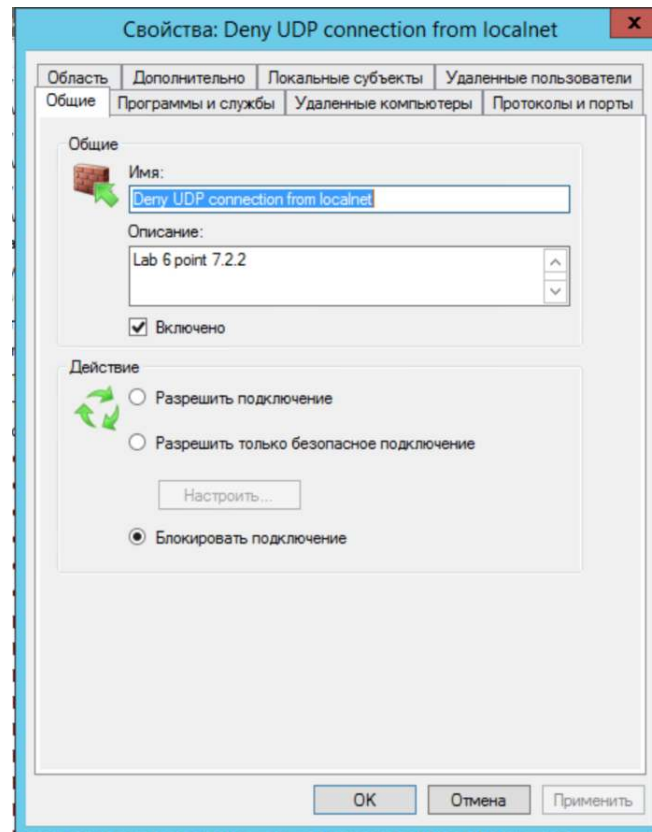



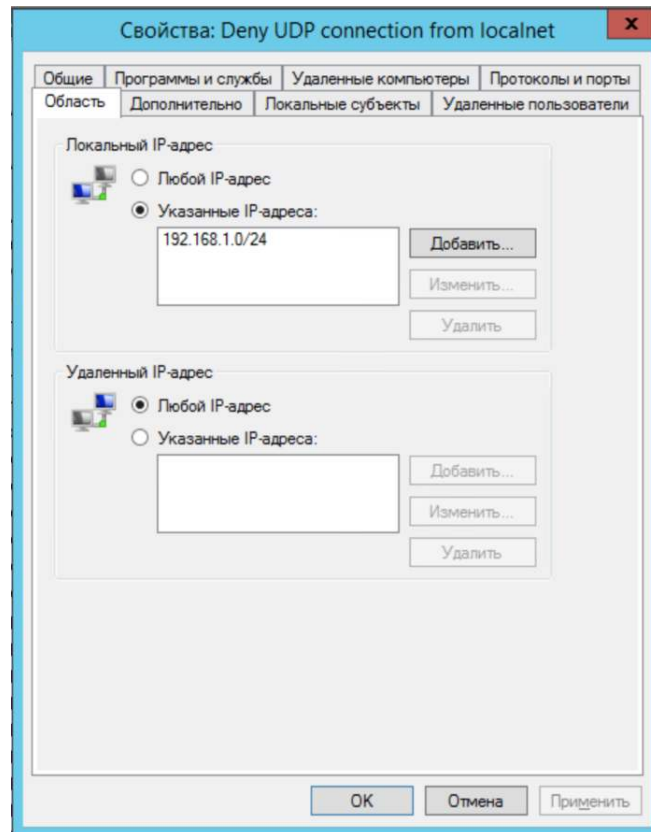
```

C:\Users\admin\Desktop\iperf-3.1.3-win64>iperf3.exe -c 192.168.1.1 -u
Connecting to host 192.168.1.1, port 5201
[ 41] local 192.168.1.5 port 54045 connected to 192.168.1.1 port 5201
[ ID] Interval      Transfer    Bandwidth  Total Datagrams
[ 41] 0.00-1.01 sec   3.02 MBytes 25.0 Mbits/sec 387
[ 41] 1.01-2.01 sec   80.0 KBytes 656 Kbits/sec 10
[ 41] 2.01-3.01 sec   80.0 KBytes 656 Kbits/sec 10
[ 41] 3.01-4.01 sec   80.0 KBytes 656 Kbits/sec 10
[ 41] 4.01-5.01 sec   80.0 KBytes 656 Kbits/sec 10
[ 41] 5.01-6.01 sec   80.0 KBytes 656 Kbits/sec 10
[ 41] 6.01-7.00 sec   80.0 KBytes 656 Kbits/sec 10
[ 41] 7.00-8.00 sec   80.0 KBytes 656 Kbits/sec 10
[ 41] 8.00-9.00 sec   80.0 KBytes 656 Kbits/sec 10
[ 41] 9.00-10.02 sec  80.0 KBytes 646 Kbits/sec 10
-- -- -- -- --
[ ID] Interval      Transfer    Bandwidth  Jitter    Lost/Tot. Datagrams
[ 41] 0.00-10.02 sec  3.73 MBytes 3.12 Mbits/sec 0.188 ms 297/476 (62%)
[ 41] Sent 476 datagrams

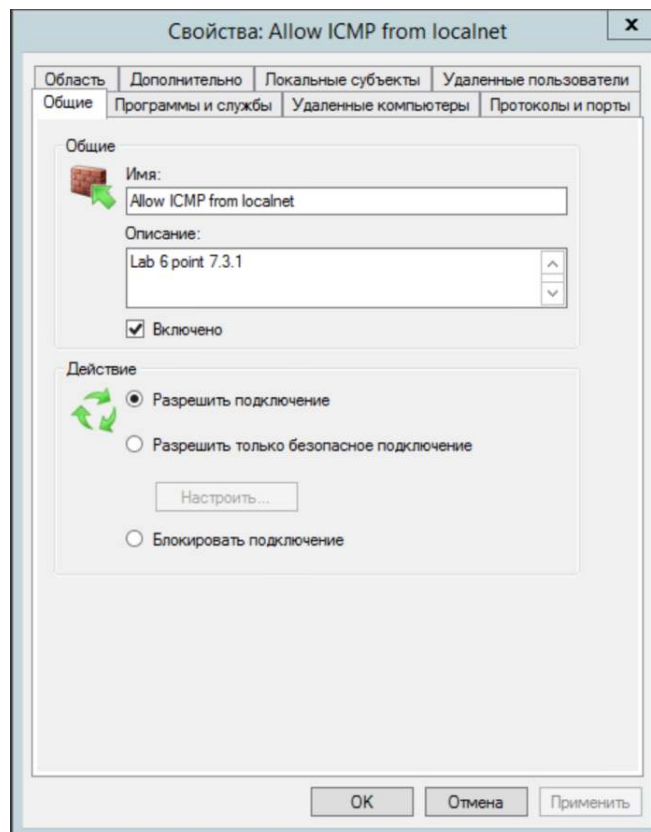
iperf Done.

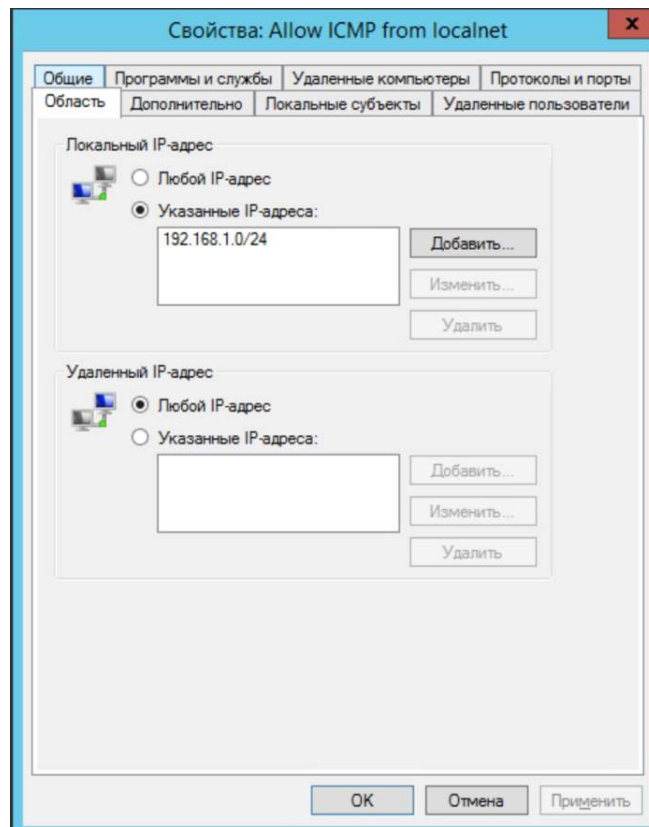
```





```
C:\Users\admin\Desktop>iperf-3.1.3-win64>iperf3.exe -c 192.168.1.1 -u
Connecting to host 192.168.1.1, port 5201
-----
[ ID] Interval           Transfer     Bandwidth       Jitter    Lost/TOTAL  Datagrams
[  0] 0.0-1.0 sec      0.00 MBytes  0.00 Mbits/sec  0.000 ms    0/0         0
```

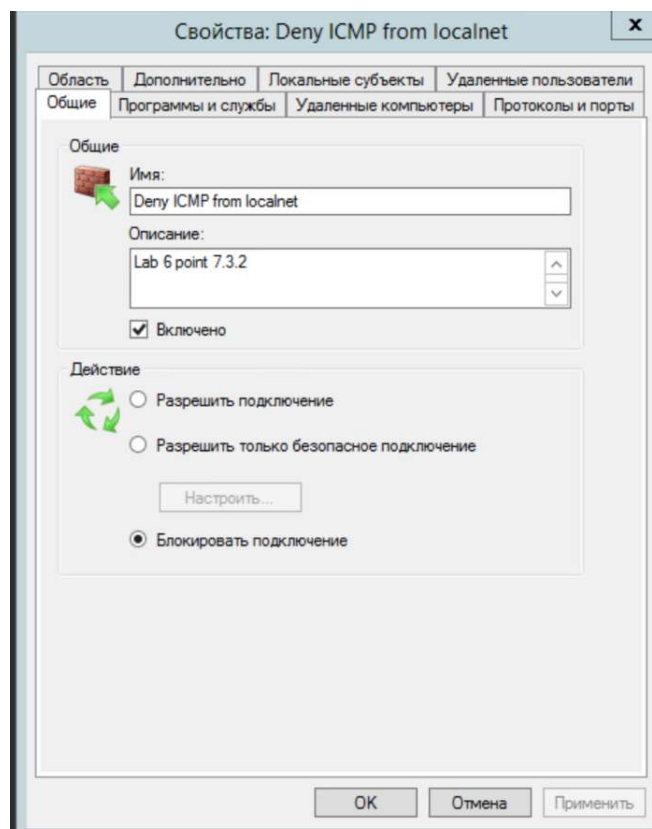


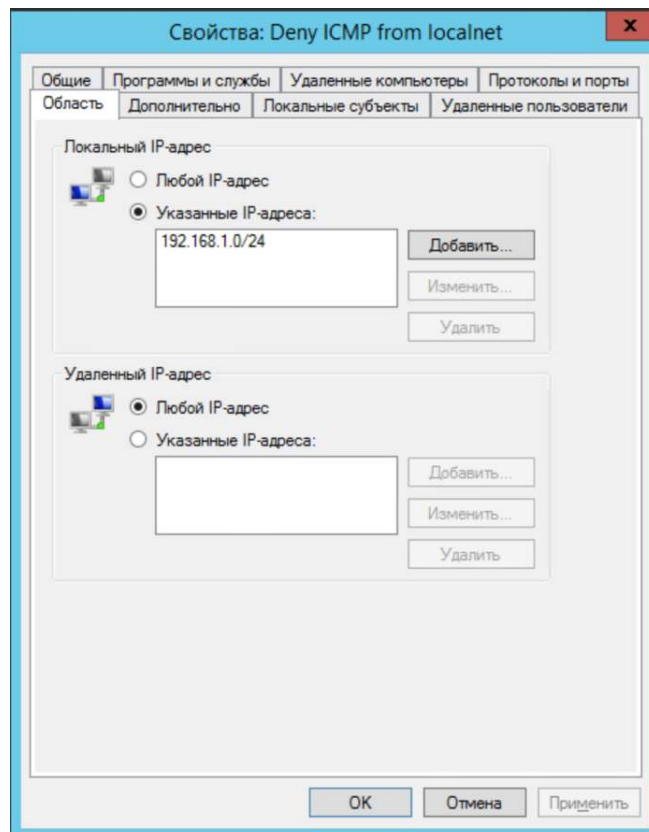


```
C:\Users\admin\Desktop\iperf-3.1.3-win64>ping 192.168.1.1

Обмен пакетами с 192.168.1.1 по 32 байтами данных:
Ответ от 192.168.1.1: число байт=32 время<1мс TTL=128
Ответ от 192.168.1.1: число байт=32 время<1мс TTL=128
Ответ от 192.168.1.1: число байт=32 время<1мс TTL=128
Ответ от 192.168.1.1: число байт=32 время<1мс TTL=128

Статистика Ping для 192.168.1.1:
    Пакетов: отправлено = 4, получено = 4, потеряно = 0
    (0% потерь)
    Приблизительное время приема-передачи в мс:
    Минимальное = 0мсек, Максимальное = 0 мсек, Среднее = 0 мсек
```



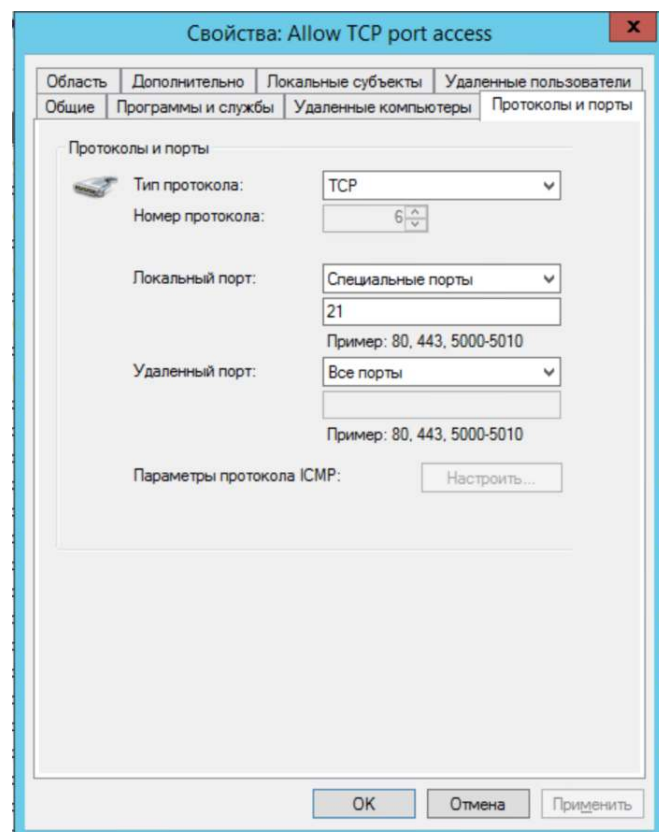
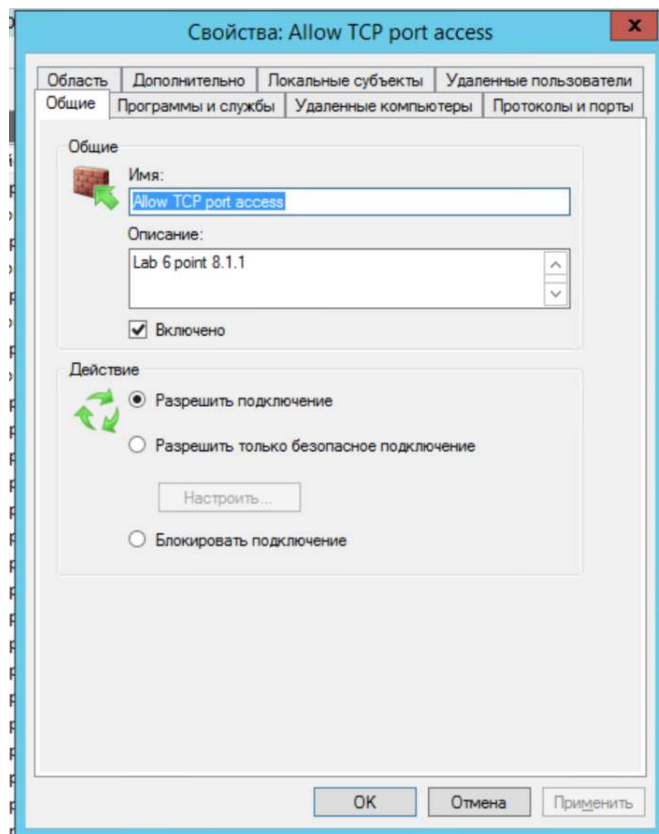


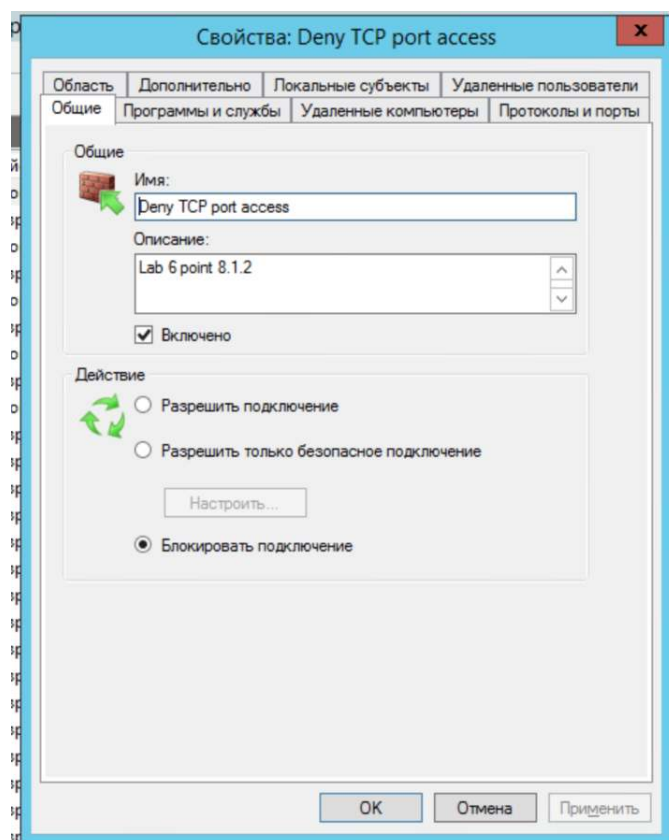
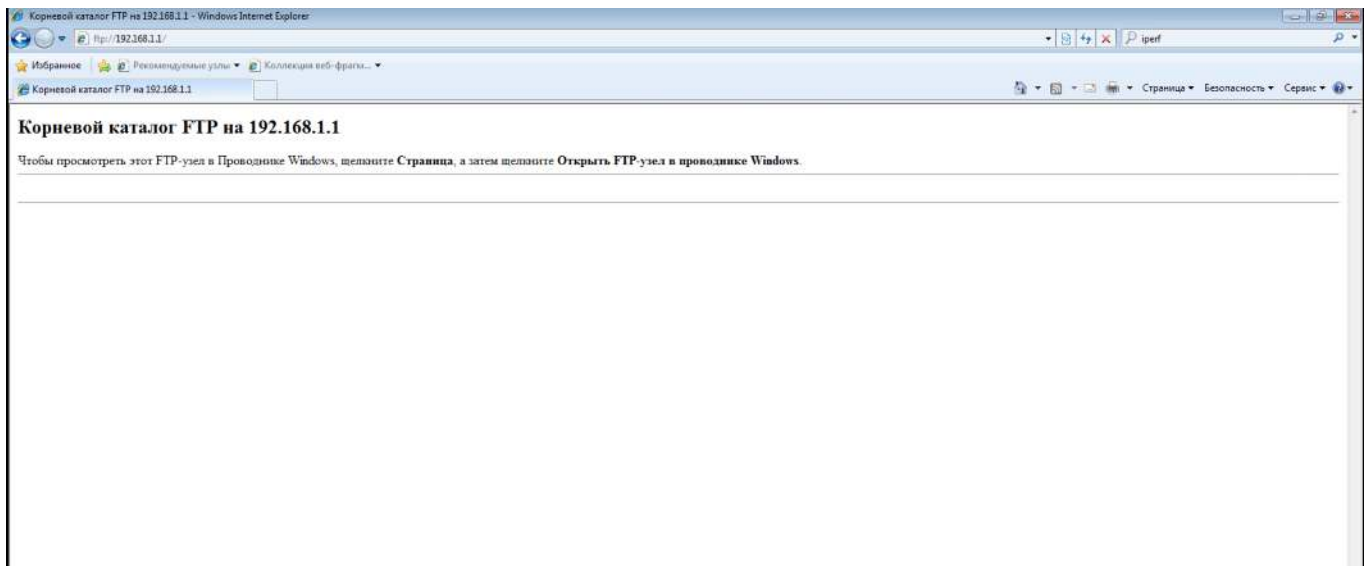
```
C:\Users\admin\Desktop\iperf-3.1.3-win64>ping 192.168.1.1

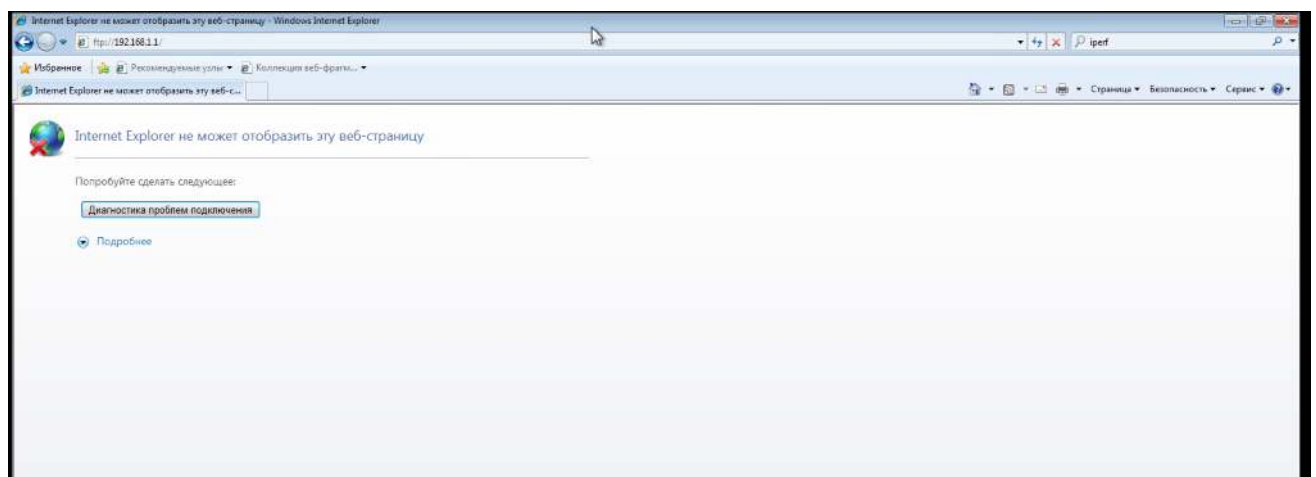
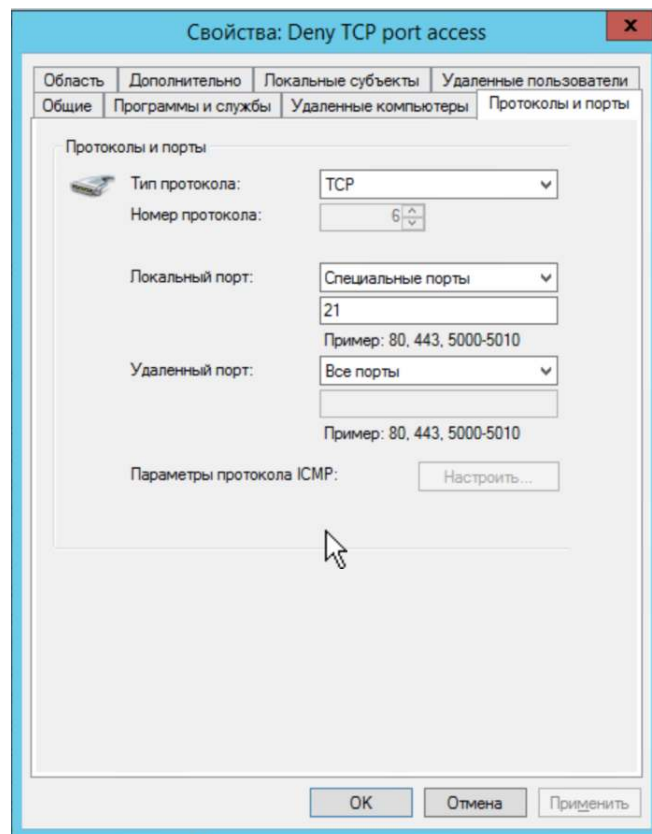
Обмен пакетами с 192.168.1.1 по 32 байтами данных:
Превышен интервал ожидания для запроса.
Превышен интервал ожидания для запроса.
Превышен интервал ожидания для запроса.
Превышен интервал ожидания для запроса.

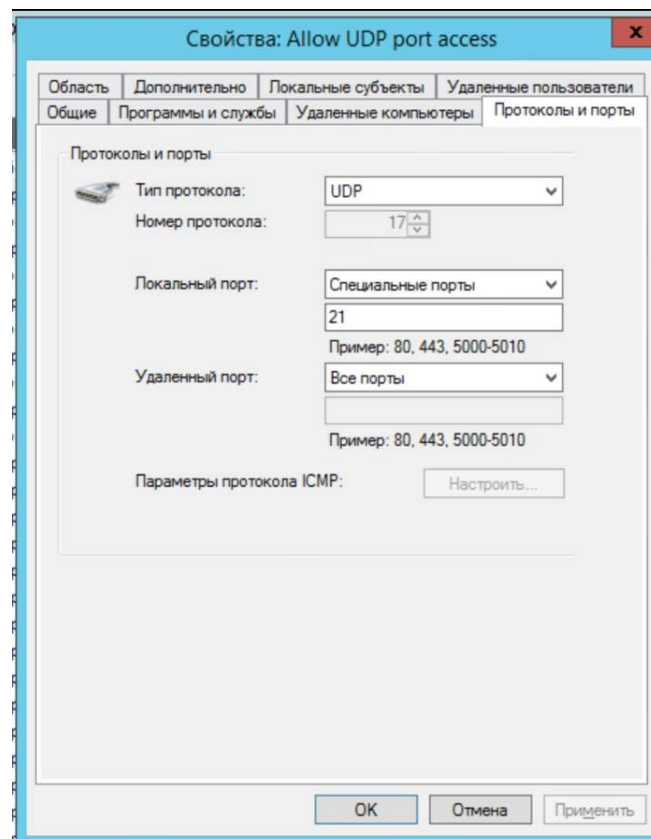
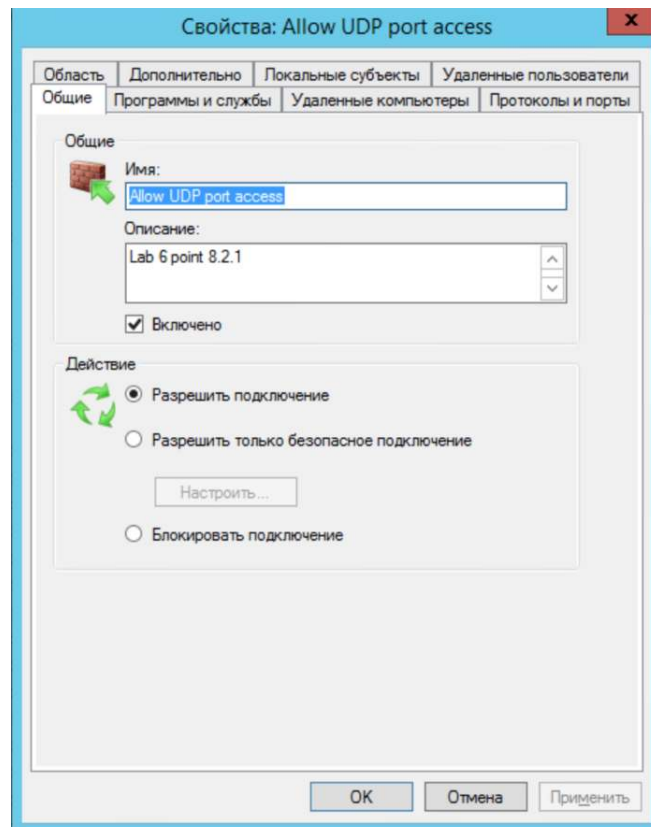
Статистика Ping для 192.168.1.1:
  Пакетов: отправлено = 4, получено = 0, потеряно = 4
    (100% потеря)
```

пункт 8







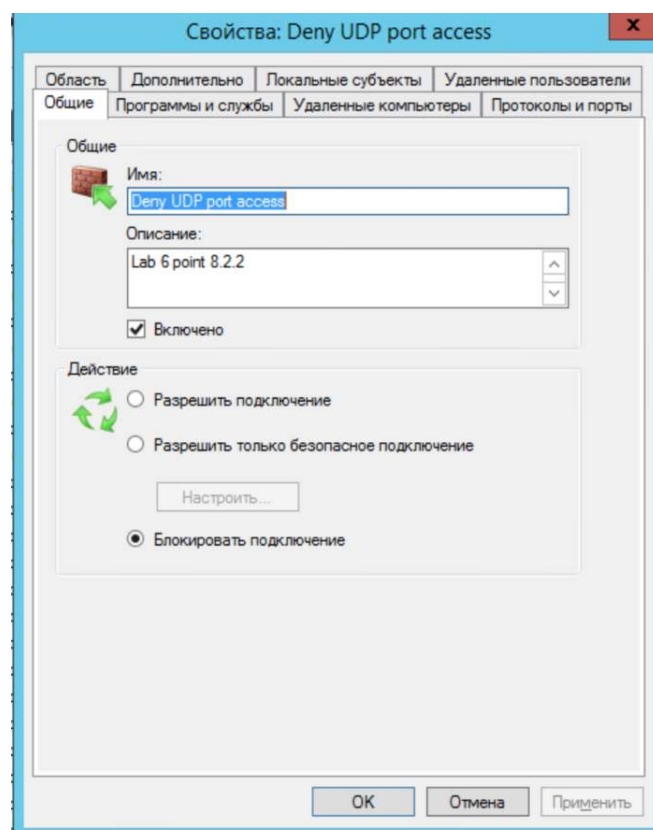


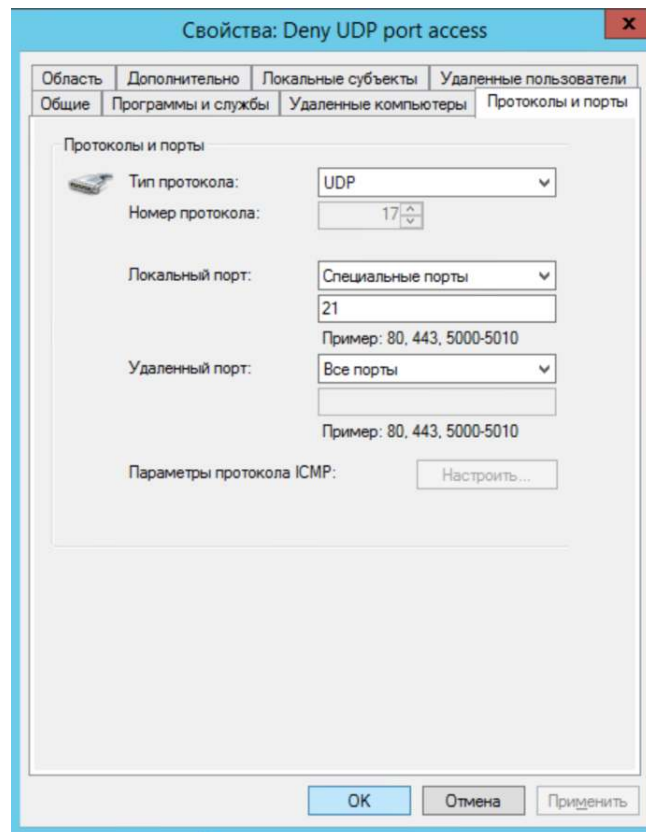
```

C:\Users\admin\Desktop\iperf-3.1.3-win64>iperf3.exe -c 192.168.1.1 -u -p 21
Connecting to host 192.168.1.1, port 21
[ 41] local 192.168.1.5 port 54170 connected to 192.168.1.1 port 21
[ ID] Interval           Transfer     Bandwidth   Total Datagrams
[ 41] 0.00-1.01 sec      2.20 MBytes  18.2 Mbits/sec  281
[ 41] 1.01-2.01 sec      80.0 KBytes  656 Kbits/sec   10
[ 41] 2.01-3.01 sec      80.0 KBytes  656 Kbits/sec   10
[ 41] 3.01-4.01 sec      80.0 KBytes  656 Kbits/sec   10
[ 41] 4.01-5.01 sec      80.0 KBytes  656 Kbits/sec   10
[ 41] 5.01-6.01 sec      80.0 KBytes  656 Kbits/sec   10
[ 41] 6.01-7.00 sec      80.0 KBytes  656 Kbits/sec   10
[ 41] 7.00-8.00 sec      80.0 KBytes  656 Kbits/sec   10
[ 41] 8.00-9.00 sec      80.0 KBytes  656 Kbits/sec   10
[ 41] 9.00-10.02 sec     80.0 KBytes  646 Kbits/sec   10
--
[ ID] Interval           Transfer     Bandwidth   Jitter    Lost/Total Datagrams
[ 41] 0.00-10.02 sec     2.90 MBytes  2.43 Mbits/sec  0.218 ms  124/370 (34%)
[ 41] Sent 370 datagrams

iperf Done.
C:\Users\admin\Desktop\iperf-3.1.3-win64>

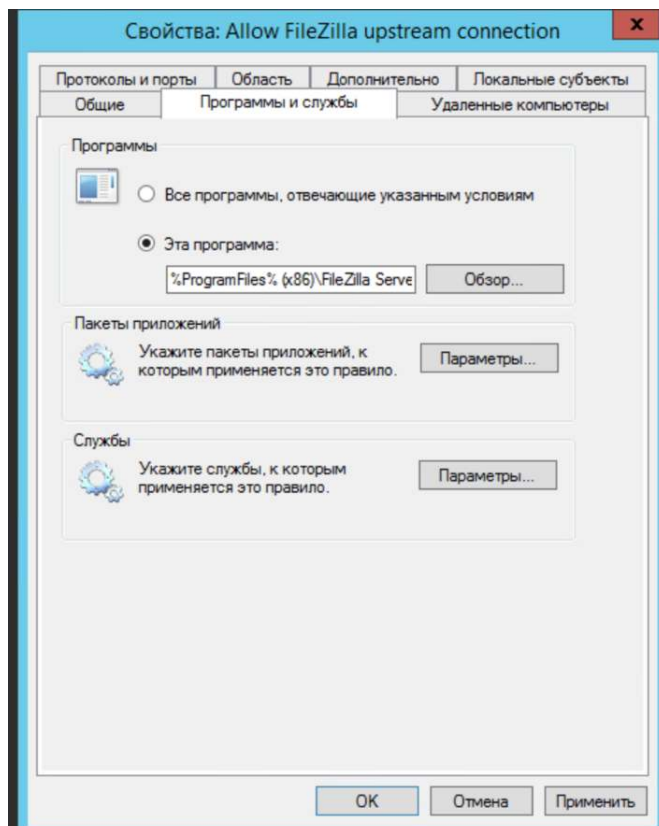
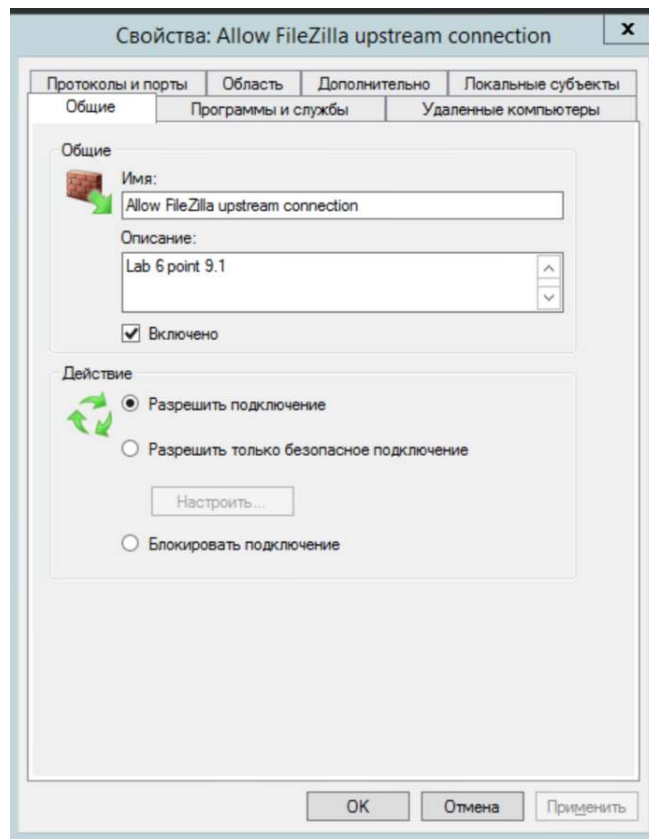
```

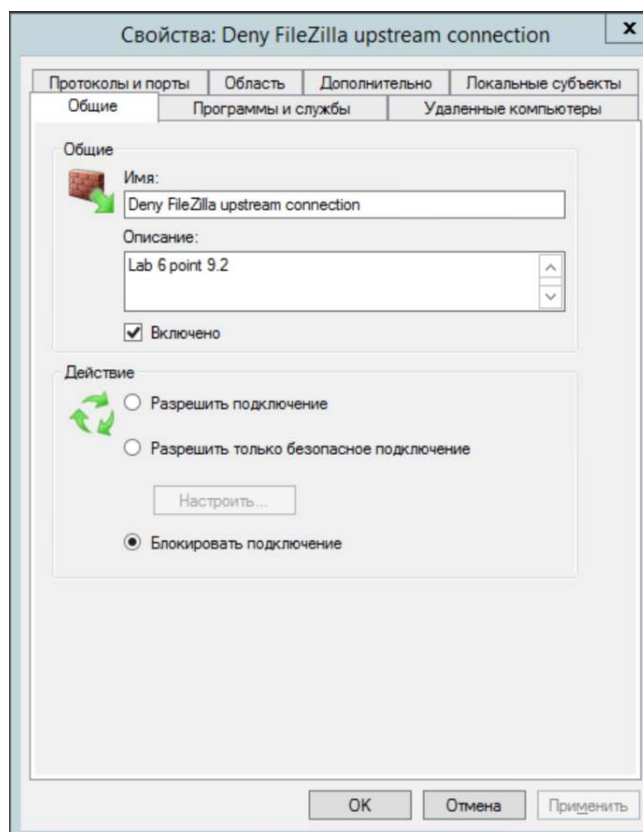
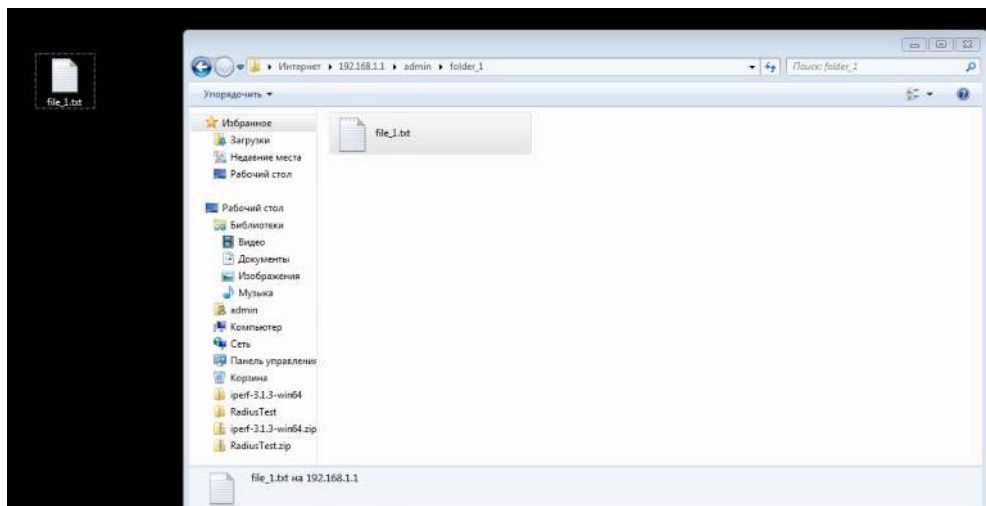


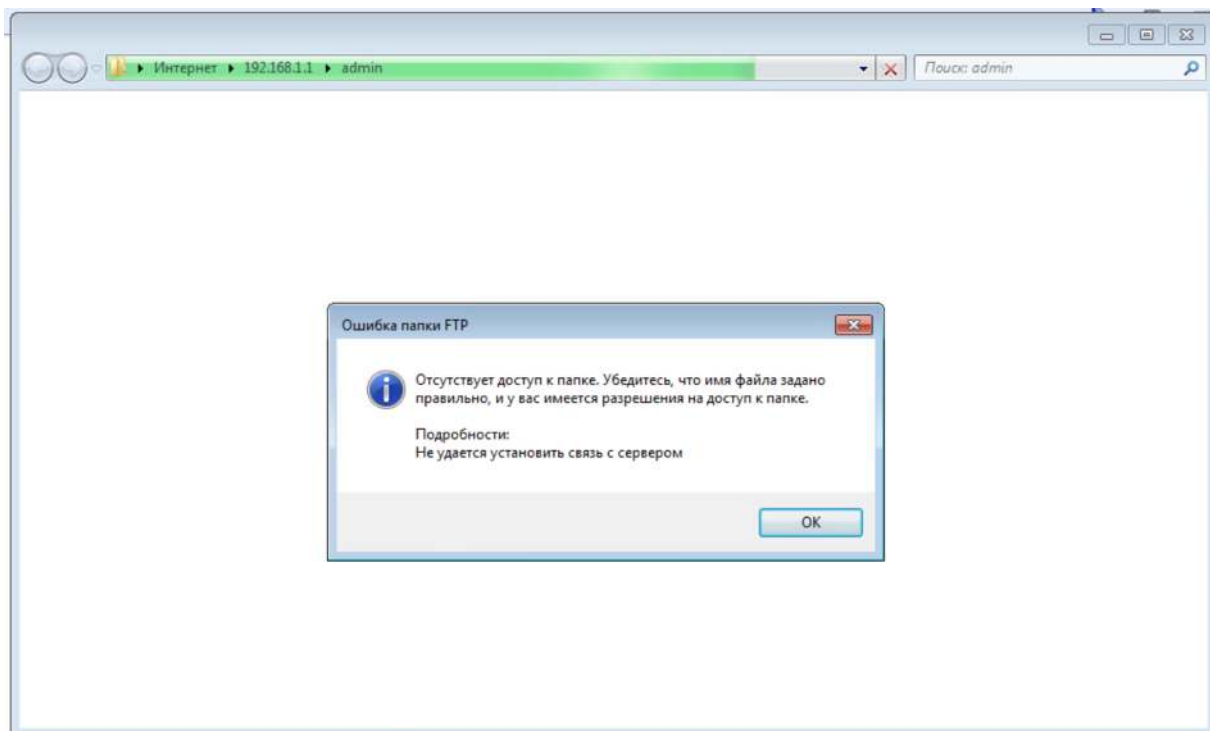


```
C:\Users\admin\Desktop\iperf-3.1.3-win64>iperf3.exe -c 192.168.1.1 -u -p 21
Connecting to host 192.168.1.1, port 21
```

пункт 9







Вывод:

В ходе данной лабораторной работы мы научились поднимать простейший ftp-server, создавать, настраивать и управлять правилами брандмауэра для разных протоколов, портов и приложений. Также мы провели проверку работоспособности данных правил.