

Настройка списков управления доступом (ACL)

Лабораторная работа № 10

Шулуужук А. В.

11 апреля 2025

Российский университет дружбы народов, Москва, Россия

Освоить настройку прав доступа пользователей к ресурсам сети.

Выполнение лабораторной работы

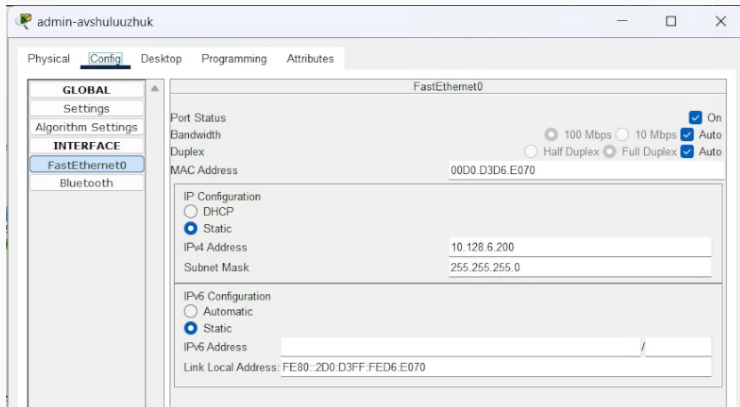


Рис. 1: присвоение статического адреса

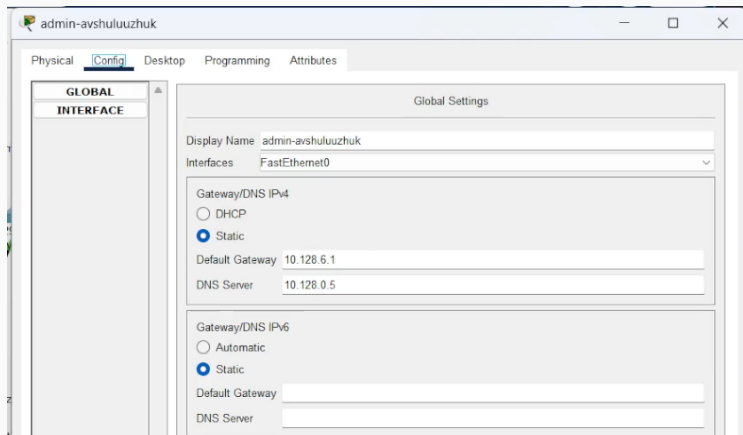


Рис. 2: шлюз и адрес DNS-сервера

```
msk-donskaya-avshuluuzhuk-gw-1>en
Password:
msk-donskaya-avshuluuzhuk-gw-1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
msk-donskaya-avshuluuzhuk-gw-1(config)#
msk-donskaya-avshuluuzhuk-gw-1(config)#ip access-list extended servers-out
msk-donskaya-avshuluuzhuk-gw-1(config-ext-nacl)#remark web
msk-donskaya-avshuluuzhuk-gw-1(config-ext-nacl)#permit tcp any host 10.128.0.2 eq 80
msk-donskaya-avshuluuzhuk-gw-1(config-ext-nacl)#^Z
msk-donskaya-avshuluuzhuk-gw-1#
%SYS-5-CONFIG_I: Configured from console by console
wr m
Building configuration...
[OK]
```

Рис. 3: настройка доступа к web-серверу по порту tcp 80

```
msk-donskaya-avshuluuzhuk-gw-1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
msk-donskaya-avshuluuzhuk-gw-1(config)#interface f0/0.3
msk-donskaya-avshuluuzhuk-gw-1(config-subif)#ip access-group servers-out out
msk-donskaya-avshuluuzhuk-gw-1(config-subif)#^Z
msk-donskaya-avshuluuzhuk-gw-1#
%SYS-5-CONFIG_I: Configured from console by console
wr m
Building configuration...
[OK]
msk-donskaya-avshuluuzhuk-gw-1#
```

Рис. 4: добавление списка управления доступом к интерфейсу

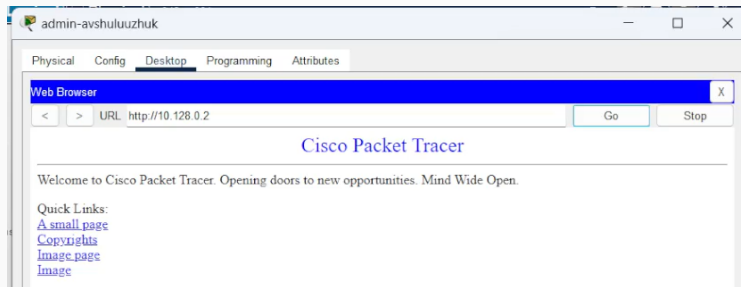
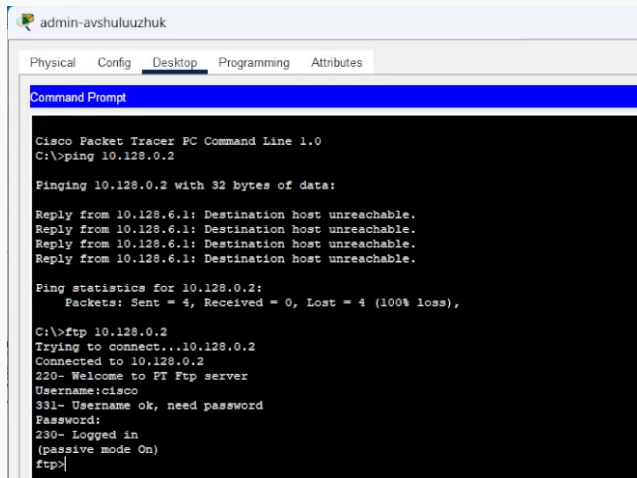


Рис. 5: проверка доступа к веб-серверу через протокол http


```
msk-donskaya-avshuluuzhuk-gw-1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
msk-donskaya-avshuluuzhuk-gw-1(config)#ip access-list extended servers-out
msk-donskaya-avshuluuzhuk-gw-1(config-ext-nacl)#permit tcp host 10.128.6.200 host 10.128.0.2 range
20 ftp
msk-donskaya-avshuluuzhuk-gw-1(config-ext-nacl)#permit tcp host 10.128.6.200 host 10.128.0.2 eq
telnet
msk-donskaya-avshuluuzhuk-gw-1(config-ext-nacl)#^Z
msk-donskaya-avshuluuzhuk-gw-1#
%SYS-5-CONFIG I: Configured from console by console
wr m
Building configuration...
[OK]
msk-donskaya-avshuluuzhuk-gw-1#
```

Рис. 6: доступ для администратора по протоколам Telnet и FTP

Выполнение лабораторной работы



The screenshot shows a Cisco Packet Tracer PC Command Line window for a device named 'admin-avshuluuzhuk'. The 'Desktop' tab is selected. The command prompt shows the following sequence of commands and outputs:

```
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 10.128.0.2

Pinging 10.128.0.2 with 32 bytes of data:

Reply from 10.128.6.1: Destination host unreachable.
Reply from 10.128.6.1: Destination host unreachable.
Reply from 10.128.6.1: Destination host unreachable.
Reply from 10.128.6.1: Destination host unreachable.

Ping statistics for 10.128.0.2:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

C:\>ftp 10.128.0.2
Trying to connect...10.128.0.2
Connected to 10.128.0.2
220- Welcome to PT Ftp server
Username:cisco
331- Username ok, need password
Password:
230- Logged in
(passive mode On)
ftp>
```

Рис. 7: получение доступа по протоколу FTP

```
msk-donskaya-avshuluuzhuk-gw-1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
msk-donskaya-avshuluuzhuk-gw-1(config)#ip access-list extended servers-out
msk-donskaya-avshuluuzhuk-gw-1(config-ext-nacl)#remark file
msk-donskaya-avshuluuzhuk-gw-1(config-ext-nacl)#permit tcp 10.128.0.0 0.0.255.255 host 10.128.0.3
eq 445
msk-donskaya-avshuluuzhuk-gw-1(config-ext-nacl)#permit tcp any host 10.128.0.3 range 20 ftp
msk-donskaya-avshuluuzhuk-gw-1(config-ext-nacl)#^Z
msk-donskaya-avshuluuzhuk-gw-1#
%SYS-5-CONFIG_I: Configured from console by console
wr m
Building configuration...
[OK]
msk-donskaya-avshuluuzhuk-gw-1#
```

Рис. 8: настройка доступа к файловому серверу

```
msk-donskaya-avshuluuzhuk-gw-1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
msk-donskaya-avshuluuzhuk-gw-1(config)#ip access-list extended servers-out
msk-donskaya-avshuluuzhuk-gw-1(config-ext-nacl)#remark mail
msk-donskaya-avshuluuzhuk-gw-1(config-ext-nacl)#permit tcp any host 10.128.0.4 eq smtp
msk-donskaya-avshuluuzhuk-gw-1(config-ext-nacl)#permit tcp any host 10.128.0.4 eq pop3
msk-donskaya-avshuluuzhuk-gw-1(config-ext-nacl)#^Z
msk-donskaya-avshuluuzhuk-gw-1#
%SYS-5-CONFIG_I: Configured from console by console
wr m
Building configuration...
[OK]
msk-donskaya-avshuluuzhuk-gw-1#
```

Рис. 9: настройка доступа к почтовому серверу

```
msk-donskaya-avshuluuzhuk-gw-1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
msk-donskaya-avshuluuzhuk-gw-1(config)#ip access-list extended servers-out
msk-donskaya-avshuluuzhuk-gw-1(config-ext-nacl)#remark dns
msk-donskaya-avshuluuzhuk-gw-1(config-ext-nacl)#permit udp 10.128.0.0 0.0.255.255 host 10.128.0.5
eq 53
msk-donskaya-avshuluuzhuk-gw-1(config-ext-nacl)#
```

Рис. 10: настройка доступа к DNS-серверу

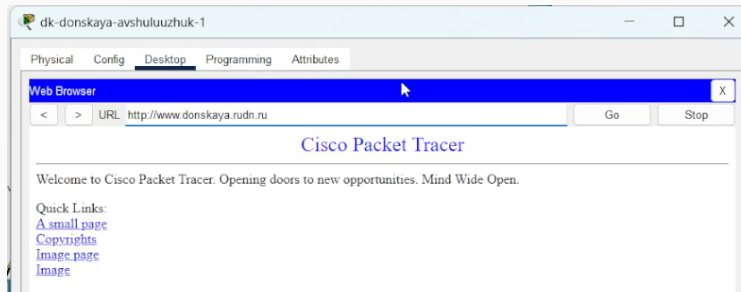


Рис. 11: проверка доступности к web-серверу

```
msk-donskaya-avshuluuzhuk-gw-1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
msk-donskaya-avshuluuzhuk-gw-1(config)#ip access-list extended servers-out
msk-donskaya-avshuluuzhuk-gw-1(config-ext-nacl)#1 permit icmp any any
msk-donskaya-avshuluuzhuk-gw-1(config-ext-nacl)#^Z
msk-donskaya-avshuluuzhuk-gw-1#
%SYS-5-CONFIG_I: Configured from console by console
wr m
Building configuration...
[OK]
msk-donskaya-avshuluuzhuk-gw-1#
```

Рис. 12: разрешение icmp-запросов

```
msk-donskaya-avshuluuzhuk-gw-1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
msk-donskaya-avshuluuzhuk-gw-1(config)#ip access-list extended other-in
msk-donskaya-avshuluuzhuk-gw-1(config-ext-nacl)#remark admin
msk-donskaya-avshuluuzhuk-gw-1(config-ext-nacl)#permit ip host 10.128.6.200 any
msk-donskaya-avshuluuzhuk-gw-1(config-ext-nacl)#exit
msk-donskaya-avshuluuzhuk-gw-1(config)#interface f0/0.104
msk-donskaya-avshuluuzhuk-gw-1(config-subif)#ip access-group other-in in
msk-donskaya-avshuluuzhuk-gw-1(config-subif)#^Z
msk-donskaya-avshuluuzhuk-gw-1#
%SYS-5-CONFIG_I: Configured from console by console
wr m
Building configuration...
[OK]
```

Рис. 13: настройка доступа для сети Other


```
msk-donskaya-avshuluuzhuk-gw-1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
msk-donskaya-avshuluuzhuk-gw-1(config)#ip access-list extended management-out
msk-donskaya-avshuluuzhuk-gw-1(config-ext-nacl)#remark admin
msk-donskaya-avshuluuzhuk-gw-1(config-ext-nacl)#permit ip host 10.128.6.200 10.128.1.0 0.0.0.255
msk-donskaya-avshuluuzhuk-gw-1(config-ext-nacl)#exit
msk-donskaya-avshuluuzhuk-gw-1(config)#interface f0/0.2
msk-donskaya-avshuluuzhuk-gw-1(config-subif)#ip access-group management-out out
msk-donskaya-avshuluuzhuk-gw-1(config-subif)#^Z
msk-donskaya-avshuluuzhuk-gw-1#
%SYS-5-CONFIG_I: Configured from console by console
wr m
Building configuration...
[OK]
msk-donskaya-avshuluuzhuk-gw-1#
```

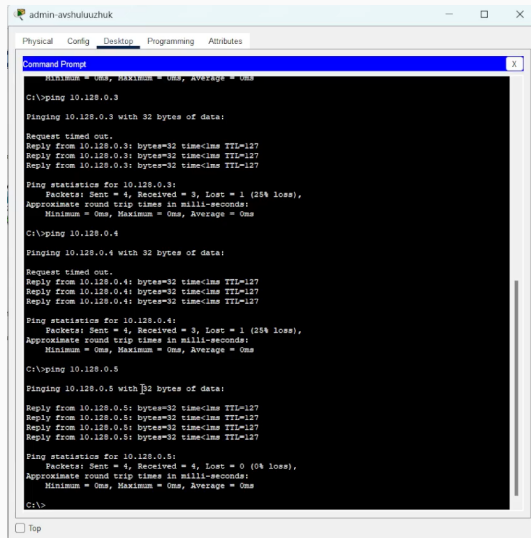
Рис. 14: настройка доступа администратора к сети сетевого оборудования

```
msk-donskaya-avshuluuzhuk-gw-1#show access-lists
Extended IP access list servers-out
 1 permit icmp any any
10 permit tcp any host 10.128.0.2 eq www (53 match(es))
20 permit tcp host 10.128.6.200 host 10.128.0.2 range 20 ftp (7 match(es))
30 permit tcp host 10.128.6.200 host 10.128.0.2 eq telnet
40 permit tcp 10.128.0.0 0.0.255.255 host 10.128.0.3 eq 445
50 permit tcp any host 10.128.0.3 range 20 ftp
60 permit tcp any host 10.128.0.4 eq smtp
70 permit tcp any host 10.128.0.4 eq pop3
80 permit udp 10.128.0.0 0.0.255.255 host 10.128.0.5 eq domain (9 match(es))
Extended IP access list other-in
 1 permit ip host 10.128.6.200 any
Extended IP access list management-out
 1 permit ip host 10.128.6.200 10.128.1.0 0.0.0.255

msk-donskaya-avshuluuzhuk-gw-1#
```

Рис. 15: просмотр списка контроля доступа

Выполнение лабораторной работы



The screenshot shows a Windows Command Prompt window titled "admin-avshuluuzhuk". The window has tabs for "Physical", "Config", "Desktop", "Programming", and "Attributes", with "Desktop" currently selected. The Command Prompt displays the following text:

```
Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 10.128.0.3

Pinging 10.128.0.3 with 32 bytes of data:

Request timed out.
Reply from 10.128.0.3: bytes=32 time<1ms TTL=127
Reply from 10.128.0.3: bytes=32 time<1ms TTL=127
Reply from 10.128.0.3: bytes=32 time<1ms TTL=127

Ping statistics for 10.128.0.3:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 10.128.0.4

Pinging 10.128.0.4 with 32 bytes of data:

Request timed out.
Reply from 10.128.0.4: bytes=32 time<1ms TTL=127
Reply from 10.128.0.4: bytes=32 time<1ms TTL=127
Reply from 10.128.0.4: bytes=32 time<1ms TTL=127

Ping statistics for 10.128.0.4:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 10.128.0.5

Pinging 10.128.0.5 with 32 bytes of data:

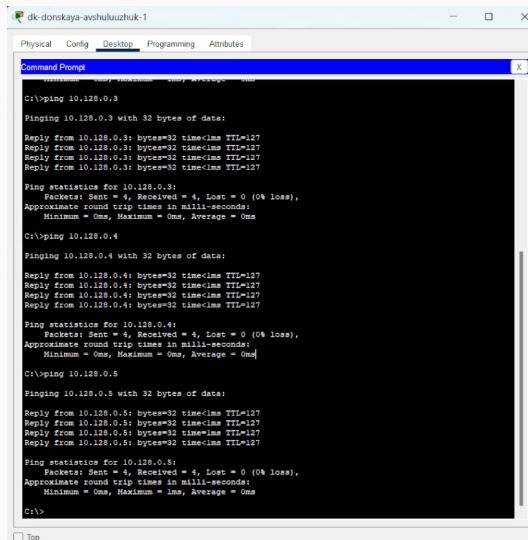
Reply from 10.128.0.5: bytes=32 time<1ms TTL=127
Reply from 10.128.0.5: bytes=32 time<1ms TTL=127
Reply from 10.128.0.5: bytes=32 time<1ms TTL=127
Reply from 10.128.0.5: bytes=32 time<1ms TTL=127

Ping statistics for 10.128.0.5:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>
```

At the bottom left of the Command Prompt window, there is a checkbox labeled "Top" which is currently unchecked.

Рис. 16: проверка корректности установленных правил доступа



The screenshot shows a virtual desktop environment with a window titled "dk-donskaya-avshuluuzhuk-1". The window has tabs for "Physical", "Config", "Desktop", "Programming", and "Attributes", with "Desktop" currently selected. Inside the window is a "Command Prompt" application. The command prompt shows three ping tests being performed from the C:\ directory to IP addresses 10.128.0.3, 10.128.0.4, and 10.128.0.5. Each test shows four successful replies with 32 bytes of data, a time-to-live (TTL) of 127, and zero loss. The ping statistics for each test indicate that 4 packets were sent and 4 were received, with minimum, maximum, and average round trip times all being 0ms.

```
C:\>ping 10.128.0.3

Pinging 10.128.0.3 with 32 bytes of data:

Reply from 10.128.0.3: bytes=32 time<1ms TTL=127
Reply from 10.128.0.3: bytes=32 time<1ms TTL=127
Reply from 10.128.0.3: bytes=32 time<1ms TTL=127
Reply from 10.128.0.3: bytes=32 time<1ms TTL=127

Ping statistics for 10.128.0.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 10.128.0.4

Pinging 10.128.0.4 with 32 bytes of data:

Reply from 10.128.0.4: bytes=32 time<1ms TTL=127
Reply from 10.128.0.4: bytes=32 time<1ms TTL=127
Reply from 10.128.0.4: bytes=32 time<1ms TTL=127
Reply from 10.128.0.4: bytes=32 time<1ms TTL=127

Ping statistics for 10.128.0.4:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 10.128.0.5

Pinging 10.128.0.5 with 32 bytes of data:

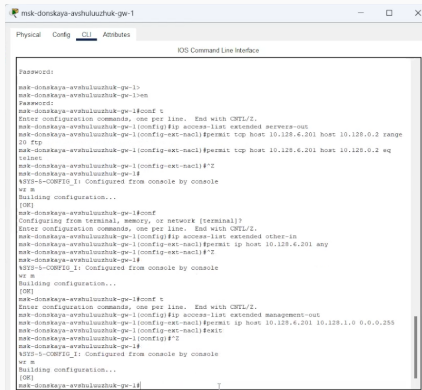
Reply from 10.128.0.5: bytes=32 time<1ms TTL=127
Reply from 10.128.0.5: bytes=32 time<1ms TTL=127
Reply from 10.128.0.5: bytes=32 time<1ms TTL=127
Reply from 10.128.0.5: bytes=32 time<1ms TTL=127

Ping statistics for 10.128.0.5:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>
```

Рис. 17: проверка корректности установленных правил доступа

Выполнение лабораторной работы



```
msk-donskaya-avshuluzhuk-gw-1
Physical Config CLI Attributes
IOS Command Line Interface

Password:
msk-donskaya-avshuluzhuk-gw-1>
msk-donskaya-avshuluzhuk-gw-1>en
Password:
msk-donskaya-avshuluzhuk-gw-1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
msk-donskaya-avshuluzhuk-gw-1(config)#ip access-list extended servers-out
msk-donskaya-avshuluzhuk-gw-1(config-ext-nacl)#permit top host 10.128.6.201 host 10.128.0.2 range
10 ftp
msk-donskaya-avshuluzhuk-gw-1(config-ext-nacl)#permit top host 10.128.6.201 host 10.128.0.2 eq
telnet
msk-donskaya-avshuluzhuk-gw-1(config-ext-nacl)#Z
msk-donskaya-avshuluzhuk-gw-1#
VTYD-5-COFIG_1: Configured from console by console
vr #
Building configuration...
[OK]
msk-donskaya-avshuluzhuk-gw-1#conf
Configuring from terminal, memory, or network (terminal)?
Enter configuration commands, one per line. End with CNTL/Z.
msk-donskaya-avshuluzhuk-gw-1(config)#ip access-list extended other-in
msk-donskaya-avshuluzhuk-gw-1(config-ext-nacl)#permit ip host 10.128.6.201 any
msk-donskaya-avshuluzhuk-gw-1(config-ext-nacl)#Z
msk-donskaya-avshuluzhuk-gw-1#
VTYD-5-COFIG_1: Configured from console by console
vr #
Building configuration...
[OK]
msk-donskaya-avshuluzhuk-gw-1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
msk-donskaya-avshuluzhuk-gw-1(config)#ip access-list extended management-out
msk-donskaya-avshuluzhuk-gw-1(config-ext-nacl)#permit ip host 10.128.6.201 10.128.1.0 0.0.0.255
msk-donskaya-avshuluzhuk-gw-1(config-ext-nacl)#exit
msk-donskaya-avshuluzhuk-gw-1(config)#Z
msk-donskaya-avshuluzhuk-gw-1#
VTYD-5-COFIG_1: Configured from console by console
vr #
Building configuration...
[OK]
msk-donskaya-avshuluzhuk-gw-1#
```

Рис. 18: настройка доступа администратора из сети Other на Павловской

Выводы

В результате выполнения лабораторной работы было освоено настройка прав доступа пользователей к ресурсам сети.