

Лабораторная работа № 10

Настройка списков управления доступом (ACL)

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Цель

Освоить настройку прав доступа пользователей к ресурсам сети.

Задание

1. Требуется настроить правила доступа.
2. Требуется проверить правильность действия установленных правил доступа.
3. Требуется выполнить задание для самостоятельной работы по настройке прав доступа администратора сети на Павловской.
4. При выполнении работы необходимо учитывать соглашение об именовании.

Выполнение лабораторной работы

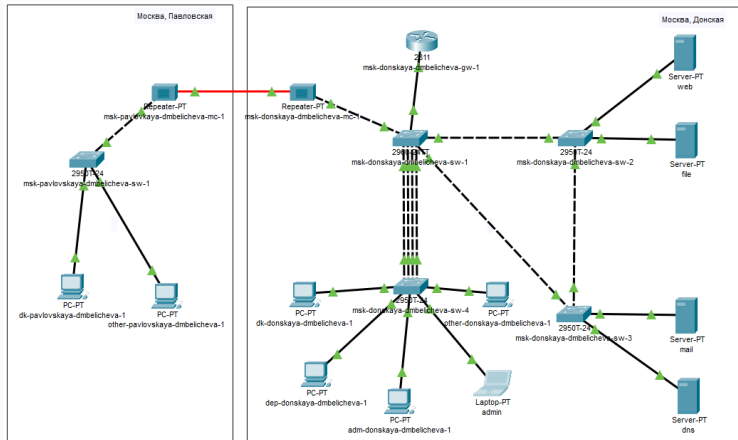


Рис. 1: Размещение ноутбука администратора в сети other-donskaya-1

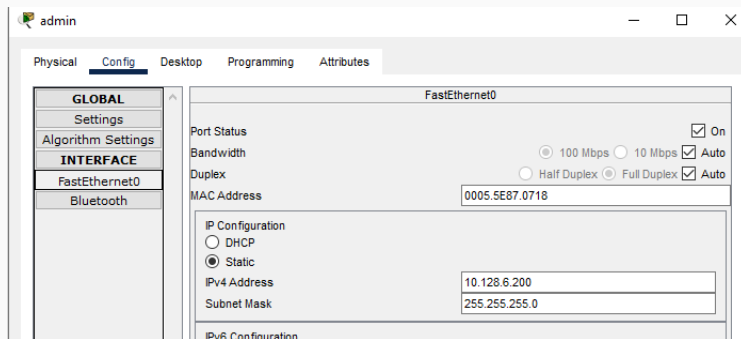


Рис. 2: Задание статического ip-адреса ноутбуку admin

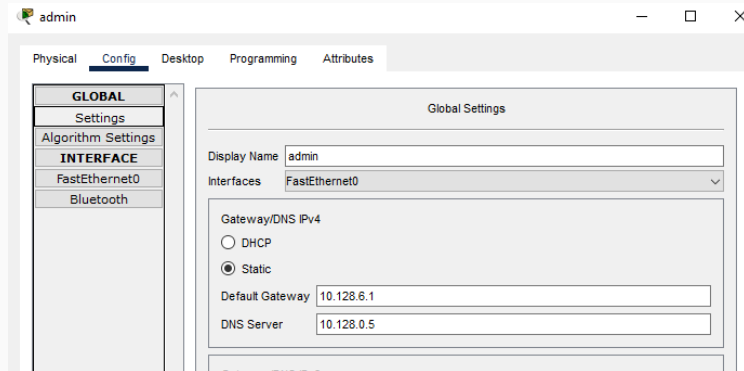


Рис. 3: Задание gateway-адреса и адреса DNS-сервера ноутбуку admin

```
C:\>ping 10.128.0.5

Pinging 10.128.0.5 with 32 bytes of data:

Request timed out.
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 = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 10.128.0.2

Pinging 10.128.0.2 with 32 bytes of data:

Request timed out.
Reply from 10.128.0.2: bytes=32 time<1ms TTL=127
Reply from 10.128.0.2: bytes=32 time<1ms TTL=127
Reply from 10.128.0.2: bytes=32 time<1ms TTL=127
```

Рис. 4: Проверка работоспособности соединения ноутбука admin


```
msk-donskaya-dmbelicheva-gw-1(config)#ip access-list extended servers-out
msk-donskaya-dmbelicheva-gw-1(config-ext-nacl)#remark web
msk-donskaya-dmbelicheva-gw-1(config-ext-nacl)#permit tcp any host 10.128.0.2 eq 80
msk-donskaya-dmbelicheva-gw-1(config-ext-nacl)#^Z
msk-donskaya-dmbelicheva-gw-1#
```

Рис. 5: Настройка доступа к web-серверу по порту tcp 80

```
Enter configuration commands, one per line. End with CNTL/Z.  
msk-donskaya-dmbelicheva-gw-1(config)#int f0/0.3  
msk-donskaya-dmbelicheva-gw-1(config-subif)#ip access-group servers-out out  
msk-donskaya-dmbelicheva-gw-1(config-subif)#^Z
```

Рис. 6: Добавление списка управления доступом к интерфейсу

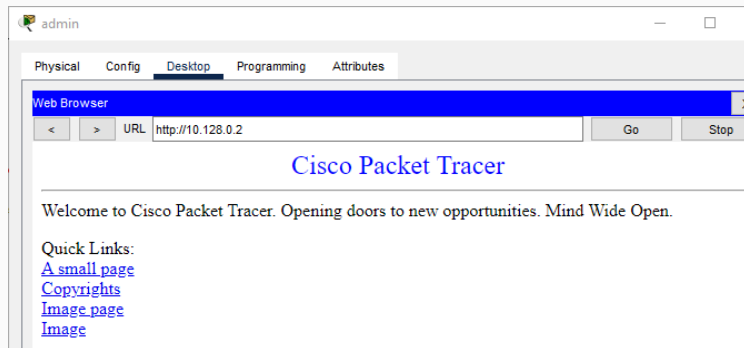


Рис. 7: Проверка доступа к web-серверу через протокол HTTP

```
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:\>ping 10.128.0.5

Pinging 10.128.0.5 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 10.128.0.5:
```

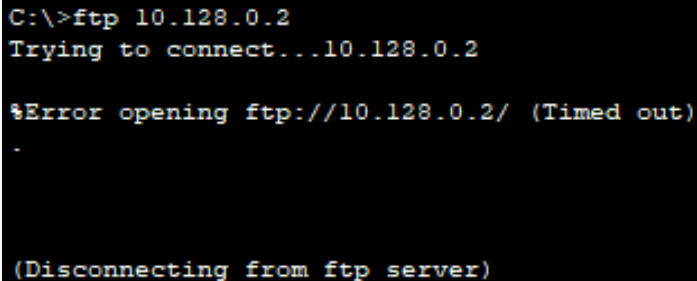
Рис. 8: Проверка недоступности web-сервера через ping

```
msh-donskaya-dmbelicheva-gw-1(config)#ip access-list extended servers-out
msh-donskaya-dmbelicheva-gw-1(config-ext-nacl)#permit tcp host 10.128.6.200 host 10.128.0.2 range 20 ftp
msh-donskaya-dmbelicheva-gw-1(config-ext-nacl)#permit tcp host 10.128.6.200 host 10.128.0.2 eq telnet
msh-donskaya-dmbelicheva-gw-1(config-ext-nacl)#^Z
msh-donskaya-dmbelicheva-gw-1#
```

Рис. 9: Настройка дополнительного доступа для администратора по протоколам Telnet и FTP

```
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. 10: Проверка работы ftp у администратора



```
C:\>ftp 10.128.0.2
Trying to connect...10.128.0.2

%Error opening ftp://10.128.0.2/ (Timed out)
.

(Disconnecting from ftp server)
```

Рис. 11: Проверка недоступности подключения по ftp у просто пользователя

```
msk-donskaya-dnbelicheva-gw-1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
msk-donskaya-dnbelicheva-gw-1(config)#ip access-list extended servers-out
msk-donskaya-dnbelicheva-gw-1(config-ext-nacl)#remark file
msk-donskaya-dnbelicheva-gw-1(config-ext-nacl)#permit tcp 10.120.0.0 0.0.255.255 host 10.120.0.3 eq 445
msk-donskaya-dnbelicheva-gw-1(config-ext-nacl)#permit tcp any host 10.128.0.3 range 20 ftp
msk-donskaya-dnbelicheva-gw-1(config-ext-nacl)#^Z
msk-donskaya-dnbelicheva-gw-1#
```

Рис. 12: Настройка доступа к файловому серверу


```
msk-donskaya-dnbelicheva-gw-1#conf m
Enter configuration commands, one per line. End with CNTL/Z.
msk-donskaya-dnbelicheva-gw-1(config)#
msk-donskaya-dnbelicheva-gw-1(config)#ip access-list extended servers-out
msk-donskaya-dnbelicheva-gw-1(config-ext-nacl)#remark mail
msk-donskaya-dnbelicheva-gw-1(config-ext-nacl)#permit tcp any host 10.128.0.4 eq smtp
msk-donskaya-dnbelicheva-gw-1(config-ext-nacl)#permit tcp any host 10.128.0.4 eq pop3
msk-donskaya-dnbelicheva-gw-1(config-ext-nacl)#end
```

Рис. 13: Настройка доступа к почтовому серверу

```
msk-dcnskaya-dnbelicheva-gw-1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
msk-dcnskaya-dnbelicheva-gw-1(config)#ip access list extended servers out
msk-dcnskaya-dnbelicheva-gw-1(config-ext-nacl)#remark dns
msk-dcnskaya-dnbelicheva-gw-1(config-ext-nacl)#permit udp 10.128.0.0 0.0.255.255 host 10.128.0.3 eq 445
```

Рис. 14: Настройка доступа к DNS-серверу

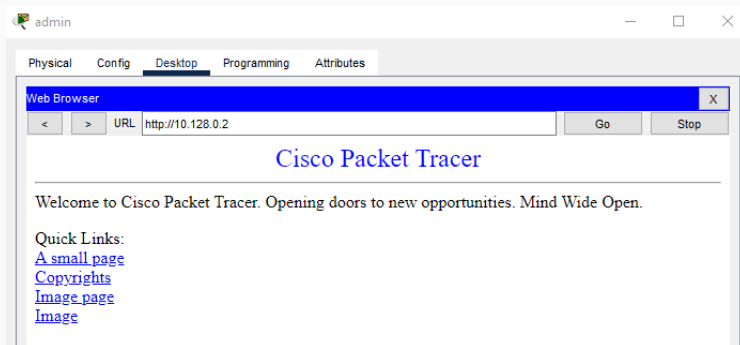


Рис. 15: Проверка доступности web-сервера по ip-адресу



Рис. 16: Проверка доступности web-сервера по имени

```
Enter configuration commands, one per line.  End with CNTL/Z.  
msk-donskaya-dmbelicheva-gw-1(config)#ip access-list extended servers-out  
msk-donskaya-dmbelicheva-gw-1(config-ext-nacl)#1 permit icmp any any  
msk-donskaya-dmbelicheva-gw-1(config-ext-nacl)#^Z  
msk-donskaya-dmbelicheva-gw-1#
```

Рис. 17: Разрешение icmp-запросов

```
msk-donskaya-dmbelicheva-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 (47 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 (2 match(es))

msk-donskaya-dmbelicheva-gw-1#
```

Рис. 18: Просмотр строк в списке контроля доступа

```
msk-donskaya-dmbelicheva-gw-1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
msk-donskaya-dmbelicheva-gw-1(config)#ip access-list extended servers-in
msk-donskaya-dmbelicheva-gw-1(config-ext-nacl)#remark admin
msk-donskaya-dmbelicheva-gw-1(config-ext-nacl)#permit ip host 10.128.6.200 any
msk-donskaya-dmbelicheva-gw-1(config-ext-nacl)#exit
msk-donskaya-dmbelicheva-gw-1(config)#int f0/0.104
msk-donskaya-dmbelicheva-gw-1(config-subif)#ip access group other in in
^
% Invalid input detected at '^' marker.

msk-donskaya-dmbelicheva-gw-1(config-subif)#ip access-group other-in in
msk-donskaya-dmbelicheva-gw-1(config-subif)#^Z
msk-donskaya-dmbelicheva-gw-1#
```

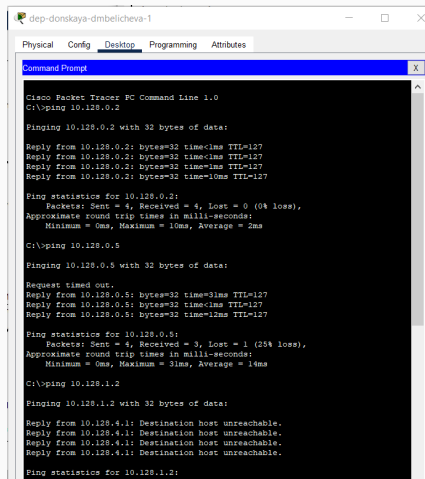
Рис. 19: Настройка доступа для сети Other

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

Рис. 20: Настройка доступа администратора к сети сетевого оборудования


```
:
ip access-list extended servers-out
  remark web
  permit icmp any any
  permit tcp any host 10.128.0.2 eq www
  permit tcp host 10.128.6.200 host 10.128.0.2 range 20 ftp
  permit tcp host 10.128.6.200 host 10.128.0.2 eq telnet
  remark file
  permit tcp 10.128.0.0 0.0.255.255 host 10.128.0.3 eq 445
  permit tcp any host 10.128.0.3 range 20 ftp
  remark mail
  permit tcp any host 10.128.0.4 eq smtp
  permit tcp any host 10.128.0.4 eq pop3
  remark dns
  permit udp 10.128.0.0 0.0.255.255 host 10.128.0.5 eq domain
ip access-list extended servers-in
  remark admin
  permit ip host 10.128.6.200 any
ip access-list extended management-out
  remark admin
  permit ip host 10.128.6.200 10.128.1.0 0.0.0.255
!
```

Рис. 21: Список контроля доступа



```
dep-donskaya-dmbelicheva-1
Physical Config Desktop Programming Attributes
Command Prompt
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 10.128.0.2: bytes=32 time<1ms TTL=127
Reply from 10.128.0.2: bytes=32 time<1ms TTL=127
Reply from 10.128.0.2: bytes=32 time<1ms TTL=127
Reply from 10.128.0.2: bytes=32 time=10ms TTL=127

Ping statistics for 10.128.0.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 10ms, Average = 2ms

C:\>ping 10.128.0.5

Pinging 10.128.0.5 with 32 bytes of data:

Request timed out.
Reply from 10.128.0.5: bytes=32 time=31ms TTL=127
Reply from 10.128.0.5: bytes=32 time<1ms TTL=127
Reply from 10.128.0.5: bytes=32 time=12ms TTL=127

Ping statistics for 10.128.0.5:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 31ms, Average = 14ms

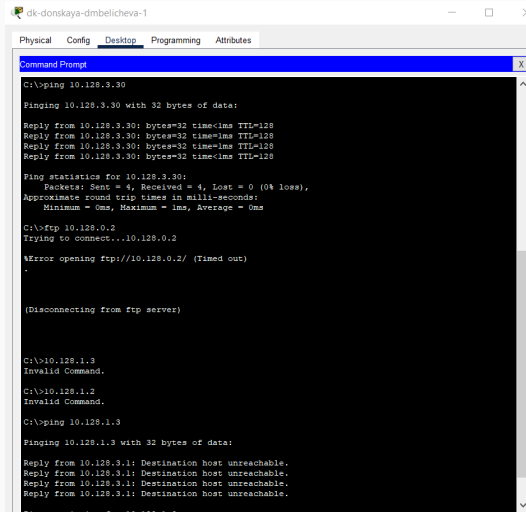
C:\>ping 10.128.1.2

Pinging 10.128.1.2 with 32 bytes of data:

Reply from 10.128.4.1: Destination host unreachable.
Reply from 10.128.4.1: Destination host unreachable.
Reply from 10.128.4.1: Destination host unreachable.
Reply from 10.128.4.1: Destination host unreachable.

Ping statistics for 10.128.1.2:
```

Рис. 22: Пингование устройств с dep-donskaya-dmbelicheva-1



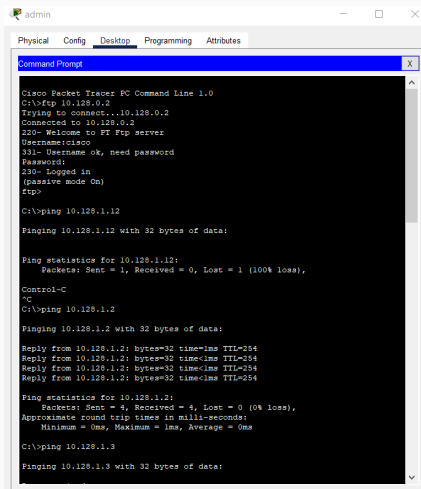
```
dk-donskaya-dmbelicheva-1
Physical Config Desktop Programming Attributes
Command Prompt
C:\>ping 10.128.3.30
Pinging 10.128.3.30 with 32 bytes of data:
Reply from 10.128.3.30: bytes=32 time<1ms TTL=128
Reply from 10.128.3.30: bytes=32 time<1ms TTL=128
Reply from 10.128.3.30: bytes=32 time<1ms TTL=128
Reply from 10.128.3.30: bytes=32 time<1ms TTL=128
Ping statistics for 10.128.3.30:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms
C:\>ftp 10.128.0.2
Trying to connect...10.128.0.2
%Error opening ftp://10.128.0.2/ (Timed out)
.
(Disconnecting from ftp server)

C:\>10.128.1.3
Invalid Command.

C:\>10.128.1.2
Invalid Command.

C:\>ping 10.128.1.3
Pinging 10.128.1.3 with 32 bytes of data:
Reply from 10.128.3.1: Destination host unreachable.
Reply from 10.128.3.1: Destination host unreachable.
Reply from 10.128.3.1: Destination host unreachable.
Reply from 10.128.3.1: Destination host unreachable.
```

Рис. 23: Проверка доступности устройств с dk-donskaya-dmbelicheva-1



```
admin
Physical Config Desktop Programming Attributes
Command Prompt X
Cisco Packet Tracer PC Command Line 1.0
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>

C:\>ping 10.128.1.12

Pinging 10.128.1.12 with 32 bytes of data:

Ping statistics for 10.128.1.12:
    Packets: Sent = 1, Received = 0, Lost = 1 (100% loss),

Control-C
^C
C:\>ping 10.128.1.2

Pinging 10.128.1.2 with 32 bytes of data:

Reply from 10.128.1.2: bytes=32 time=1ms TTL=254
Reply from 10.128.1.2: bytes=32 time=1ms TTL=254
Reply from 10.128.1.2: bytes=32 time=1ms TTL=254
Reply from 10.128.1.2: bytes=32 time=1ms TTL=254

Ping statistics for 10.128.1.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>ping 10.128.1.3

Pinging 10.128.1.3 with 32 bytes of data:
```

Рис. 24: Проверка доступности устройств с dk-donskaya-dmbelicheva-1

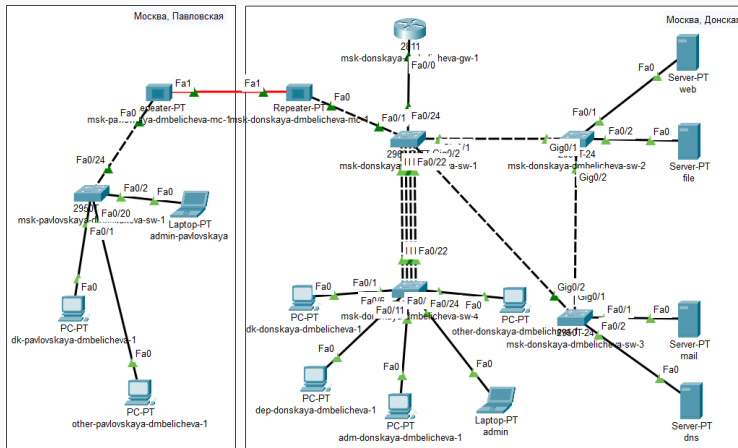


Рис. 25: Логическая область с размещенным ноутбуком admin на Павловской

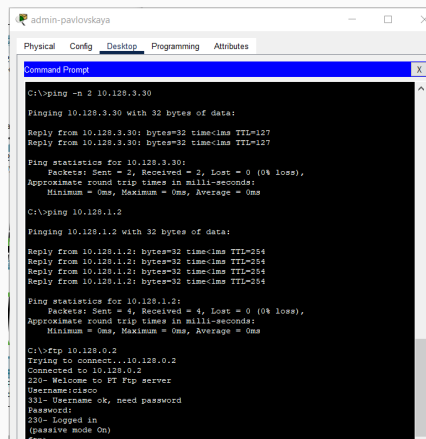
```
msk-donskaya-dmbelicheva-gw-1>en
Password:
msk-donskaya-dmbelicheva-gw-1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
msk-donskaya-dmbelicheva-gw-1(config)#ip access-list extended servers-out
msk-donskaya-dmbelicheva-gw-1(config-ext-nacl)#permit tcp host 10.128.6.201 host 10.128.0.2 range 20 ftp
msk-donskaya-dmbelicheva-gw-1(config-ext-nacl)#permit tcp host 10.128.6.201 host 10.128.0.2 eq telnet
msk-donskaya-dmbelicheva-gw-1(config-ext-nacl)#^Z
msk-donskaya-dmbelicheva-gw-1#
%SYS-5-CONFIG_I: Configured from console by console

msk-donskaya-dmbelicheva-gw-1#wr m
Building configuration...
[OK]
msk-donskaya-dmbelicheva-gw-1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
msk-donskaya-dmbelicheva-gw-1(config)#ip access-list extended other-in
msk-donskaya-dmbelicheva-gw-1(config-ext-nacl)#remark admin
msk-donskaya-dmbelicheva-gw-1(config-ext-nacl)#permit ip host 10.128.6.201 any
msk-donskaya-dmbelicheva-gw-1(config-ext-nacl)#exit
msk-donskaya-dmbelicheva-gw-1(config)#int f0/0.104
msk-donskaya-dmbelicheva-gw-1(config-subif)#ip access-group other-in in
msk-donskaya-dmbelicheva-gw-1(config-subif)#^Z
msk-donskaya-dmbelicheva-gw-1#
%SYS-5-CONFIG_I: Configured from console by console

msk-donskaya-dmbelicheva-gw-1#wr m
Building configuration...
[OK]
msk-donskaya-dmbelicheva-gw-1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
msk-donskaya-dmbelicheva-gw-1(config)#ip access-list extended management-out
msk-donskaya-dmbelicheva-gw-1(config-ext-nacl)#remark admin
msk-donskaya-dmbelicheva-gw-1(config-ext-nacl)#permit ip host 10.128.6.201 10.128.1.0 0.0.0.255
msk-donskaya-dmbelicheva-gw-1(config-ext-nacl)#exit
msk-donskaya-dmbelicheva-gw-1(config)#int f0/0.2
msk-donskaya-dmbelicheva-gw-1(config-subif)#ip access-group management-out out
msk-donskaya-dmbelicheva-gw-1(config-subif)#^Z
```

```
ip access-list extended servers-out
 remark web
 permit icmp any any
 permit tcp any host 10.128.0.2 eq www
 permit tcp host 10.128.6.200 host 10.128.0.2 range 20 ftp
 permit tcp host 10.128.6.200 host 10.128.0.2 eq telnet
 remark file
 permit tcp 10.128.0.0 0.0.255.255 host 10.128.0.3 eq 445
 permit tcp any host 10.128.0.3 range 20 ftp
 remark mail
 permit tcp any host 10.128.0.4 eq smtp
 permit tcp any host 10.128.0.4 eq pop3
 remark dns
 permit udp 10.128.0.0 0.0.255.255 host 10.128.0.5 eq domain
 permit tcp host 10.128.6.201 host 10.128.0.2 range 20 ftp
 permit tcp host 10.128.6.201 host 10.128.0.2 eq telnet
ip access-list extended management-out
 remark admin
 permit ip host 10.128.6.200 10.128.1.0 0.0.0.255
 permit ip host 10.128.6.201 10.128.1.0 0.0.0.255
ip access-list extended other-in
 remark admin
 permit ip host 10.128.6.200 any
 permit ip host 10.128.6.201 any
!
```

Рис. 27: Список контроля доступа



The screenshot shows a Windows Command Prompt window titled 'admin-pavlovskaya'. The window has tabs for 'Physical', 'Config', 'Desktop', 'Programming', and 'Attributes', with 'Desktop' currently selected. The Command Prompt displays the following commands and their outputs:

```
C:\>ping -n 2 10.128.3.30

Pinging 10.128.3.30 with 32 bytes of data:

Reply from 10.128.3.30: bytes=32 time<1ms TTL=127
Reply from 10.128.3.30: bytes=32 time<1ms TTL=127

Ping statistics for 10.128.3.30:
    Packets: Sent = 2, Received = 2, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 10.128.1.2

Pinging 10.128.1.2 with 32 bytes of data:

Reply from 10.128.1.2: bytes=32 time<1ms TTL=254
Reply from 10.128.1.2: bytes=32 time<1ms TTL=254
Reply from 10.128.1.2: bytes=32 time<1ms TTL=254
Reply from 10.128.1.2: bytes=32 time<1ms TTL=254

Ping statistics for 10.128.1.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

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

Рис. 28: Проверка корректности настроенного доступа

В процессе выполнения данной лабораторной работы я освоила настройку прав доступа пользователей к ресурсам сети.