Лабораторная работа №12

Администрирование локальных сетей

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Приобретение практических навыков по настройке доступа локальной сети к внешней сети посредством NAT.

Выполнение лабораторной работы

```
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#hostname provider-ioithenko-gw-1
provider-ioithenko-gw-1(config)#line vty 0 4
provider-ioithenko-gw-1(config-line)#password cisco
provider-ioithenko-gw-1(config-line)#login
provider-ioithenko-gw-1(config-line)#exit
provider-ioithenko-gw-1(config)#line console 0
provider-ioithenko-gw-1(config-line)#password cisco
provider-ioithenko-gw-1(config-line)#login
provider-ioithenko-gw-1(config-line)#exit
provider-ioithenko-gw-1(config)#enable secret cisco
provider-ioithenko-gw-1(config)#service password-encryption
provider-ioithenko-gw-1(config)#username admin privilege 1 secret cisco
provider-ioithenko-gw-1(config)#
```

Рис. 1: Первоначальная настройка маршрутизатора

```
%Invalid interface type and number
provider-ioithenko-sw-1(config)#line vty 0 4
provider-ioithenko-sw-1(config-line)#password cisco
provider-ioithenko-sw-1(config-line)#login
provider-ioithenko-sw-1(config-line)#exit
provider-ioithenko-sw-1(config)#line console 0
provider-ioithenko-sw-1(config-line)#password cisco
provider-ioithenko-sw-1(config-line)#login
provider-ioithenko-sw-1(config-line)#exit
provider-ioithenko-sw-1(config)#enable secret cisco
provider-ioithenko-sw-1(config)#service password-encryption
provider-ioithenko-sw-1(config)#username admin privilege 1 secret cisco
provider-ioithenko-sw-1(config)#
```

Рис. 2: Первоначальная настройка коммутатора

```
provider-ioithenko-gw-1(config)#
provider-ioithenko-gw-1(config)#int f0/0
provider-ioithenko-gw-1(config-if)#no shutdown

provider-ioithenko-gw-1(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up

provider-ioithenko-gw-1(config-if)#exit
provider-ioithenko-gw-1(config)#int f0/0.4
provider-ioithenko-gw-1(config-subif)#
%LINK-5-CHANGED: Interface FastEthernet0/0.4, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0.4, changed state to up

provider-ioithenko-gw-1(config-subif)#encapsulation dot1Q 4
provider-ioithenko-gw-1(config-subif)#ip address 198.51.100.1 255.255.255.240
provider-ioithenko-gw-1(config-subif)#description msk-donskaya
provider-ioithenko-gw-1(config-subif)#exit
provider-ioithenko-gw-1(config)#int f0/1
provider-ioithenko-gw-1(config-if)#no shutdown

provider-ioithenko-gw-1(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/1, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to up

provider-ioithenko-gw-1(config-if)#ip address 192.0.2.1 255.255.255.0
provider-ioithenko-gw-1(config-if)#description internet
provider-ioithenko-gw-1(config-if)#exit
provider-ioithenko-gw-1(config)#exit
provider-ioithenko-gw-1#
%SYS-5-CONFIG_I: Configured from console by console

provider-ioithenko-gw-1#
```

Рис. 3: Настройка интерфейсов маршрутизатора

```
provider-ioithenko-sw-1(config)#int f0/1
provider-ioithenko-sw-1(config-if)#switchport mode trunk

provider-ioithenko-sw-1(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to down

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to up

provider-ioithenko-sw-1(config-if)#exit
provider-ioithenko-sw-1(config)#int f0/2
provider-ioithenko-sw-1(config-if)#switchport mode trunk

provider-ioithenko-sw-1(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/2, changed state to down

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/2, changed state to up

provider-ioithenko-sw-1(config-if)#exit
provider-ioithenko-sw-1(config)#vlan 4
provider-ioithenko-sw-1(config-vlan)#name nat
provider-ioithenko-sw-1(config-vlan)#exit
provider-ioithenko-sw-1(config)#int vlan4
provider-ioithenko-sw-1(config-if)#
%LINK-5-CHANGED: Interface Vlan4, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan4, changed state to up

provider-ioithenko-sw-1(config-if)#no shutdown
provider-ioithenko-sw-1(config-if)#exit
```

Рис. 4: Настройка интерфейсов коммутатора

```
msk-donskaya-ioithenko-gw-1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
msk-donskaya-ioithenko-gw-1(config)#int f0/1
msk-donskaya-ioithenko-gw-1(config-if)#no shutdown

msk-donskaya-ioithenko-gw-1(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/1, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to up

msk-donskaya-ioithenko-gw-1(config-if)#exit
msk-donskaya-ioithenko-gw-1(config)#int f0/1.4
msk-donskaya-ioithenko-gw-1(config-subif)#
%LINK-5-CHANGED: Interface FastEthernet0/1.4, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1.4, changed state to up

msk-donskaya-ioithenko-gw-1(config-subif)#encapsulation dot1Q 4
msk-donskaya-ioithenko-gw-1(config-subif)#ip address 198.51.100.2 255.255.255.240
msk-donskaya-ioithenko-gw-1(config-subif)#description internet
msk-donskaya-ioithenko-gw-1(config-subif)#exit
msk-donskaya-ioithenko-gw-1(config)#exit
msk-donskaya-ioithenko-gw-1#
%SYS-5-CONFIG_I: Configured from console by console

msk-donskaya-ioithenko-gw-1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
msk-donskaya-ioithenko-gw-1(config)#ip route 0.0.0.0 0.0.0.0 255.255.255.240
msk-donskaya-ioithenko-gw-1(config)#exit
msk-donskaya-ioithenko-gw-1#
%SYS-5-CONFIG_I: Configured from console by console

msk-donskaya-ioithenko-gw-1#
```

Рис. 5: Интерфейсы маршрутизатора сети Донская

```
msk-donskaya-ioithenko-gw-1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
msk-donskaya-ioithenko-gw-1(config)#ip nat pool main-pool 198.51.100.2 198.51.100.14 netmask
255.255.255.240
msk-donskaya-ioithenko-gw-1(config)#ip access-list extended nat-inet
msk-donskaya-ioithenko-gw-1(config-ext-nacl)#remark dk
msk-donskaya-ioithenko-gw-1(config-ext-nacl)#permit tcp 10.128.3.0 0.0.0.255 host 192.0.2.1 eq
80
msk-donskaya-ioithenko-gw-1(config-ext-nacl)#no permit tcp 10.128.3.0 0.0.0.255 host 192.0.2.1
eq 80
msk-donskaya-ioithenko-gw-1(config-ext-nacl)#permit tcp 10.128.3.0 0.0.0.255 host 192.0.2.11 eq
80
msk-donskaya-ioithenko-gw-1(config-ext-nacl)#permit tcp 10.128.3.0 0.0.0.255 host 192.0.2.12 eq
80
msk-donskaya-ioithenko-gw-1(config-ext-nacl)#remark departaments
msk-donskaya-ioithenko-gw-1(config-ext-nacl)#permit tcp 10.128.5.0 0.0.0.255 host 192.0.2.14 eq
80
msk-donskaya-ioithenko-gw-1(config-ext-nacl)#remark adm
msk-donskaya-ioithenko-gw-1(config-ext-nacl)#permit tcp 10.128.5.0 0.0.0.255 host 192.0.2.14 eq
80
msk-donskaya-ioithenko-gw-1(config-ext-nacl)#remark departaments
msk-donskaya-ioithenko-gw-1(config-ext-nacl)#no permit tcp 10.128.5.0 0.0.0.255 host 192.0.2.14
eq 80
msk-donskaya-ioithenko-gw-1(config-ext-nacl)#permit tcp 10.128.4.0 0.0.0.255 host 192.0.2.13 eq
80
msk-donskaya-ioithenko-gw-1(config-ext-nacl)#remark admin
msk-donskaya-ioithenko-gw-1(config-ext-nacl)#permit ip host 10.128.6.200 any
msk-donskaya-ioithenko-gw-1(config-ext-nacl)#exit
```
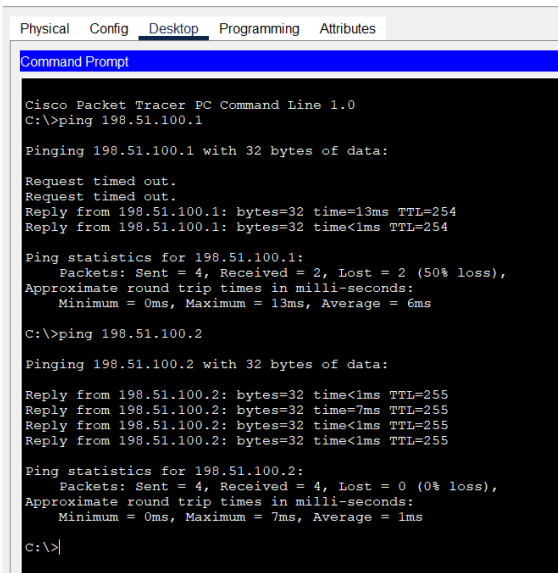
Рис. 6: Ограничения на подсети

```
msk-donskaya-ioithenko-gw-1(config)#ip nat inside source list nat-inet pool main-pool overload
msk-donskaya-ioithenko-gw-1(config)#int f0/0.3
msk-donskaya-ioithenko-gw-1(config-subif)#ip nat inside
msk-donskaya-ioithenko-gw-1(config-subif)#int f0/0.101
msk-donskaya-ioithenko-gw-1(config-subif)#ip nat inside
msk-donskaya-ioithenko-gw-1(config-subif)#int f0/0.102
msk-donskaya-ioithenko-gw-1(config-subif)#ip nat inside
msk-donskaya-ioithenko-gw-1(config-subif)#int f0/0.103
msk-donskaya-ioithenko-gw-1(config-subif)#ip nat inside
msk-donskaya-ioithenko-gw-1(config-subif)#int f0/0.104
msk-donskaya-ioithenko-gw-1(config-subif)#ip nat inside
msk-donskaya-ioithenko-gw-1(config-subif)#int f0/1.4
msk-donskaya-ioithenko-gw-1(config-subif)#ip nat outside
msk-donskaya-ioithenko-gw-1(config-subif)#exit
msk-donskaya-ioithenko-gw-1(config)#
```

Рис. 7: Настройка интерфейсов для NAT

```
msk-donskaya-ioithenko-gw-1(config)#ip nat inside source static tcp 10.128.0.2 80 198.51.100.2
80
msk-donskaya-ioithenko-gw-1(config)#ip nat inside source static tcp 10.128.0.3 20 198.51.100.3
20
msk-donskaya-ioithenko-gw-1(config)#ip nat inside source static tcp 10.128.0.3 21 198.51.100.3
21
msk-donskaya-ioithenko-gw-1(config)#ip nat inside source static tcp 10.128.0.4 25 198.51.100.4
25
msk-donskaya-ioithenko-gw-1(config)#ip nat inside source static tcp 10.128.0.4 110 198.51.100.4
110
msk-donskaya-ioithenko-gw-1(config)#ip nat inside source static tcp 10.128.6.200 3389
198.51.100.10 3389
msk-donskaya-ioithenko-gw-1(config)#
```

Рис. 8: Настройка доступа из интернета

Рис. 9: Доступность устройств для admin
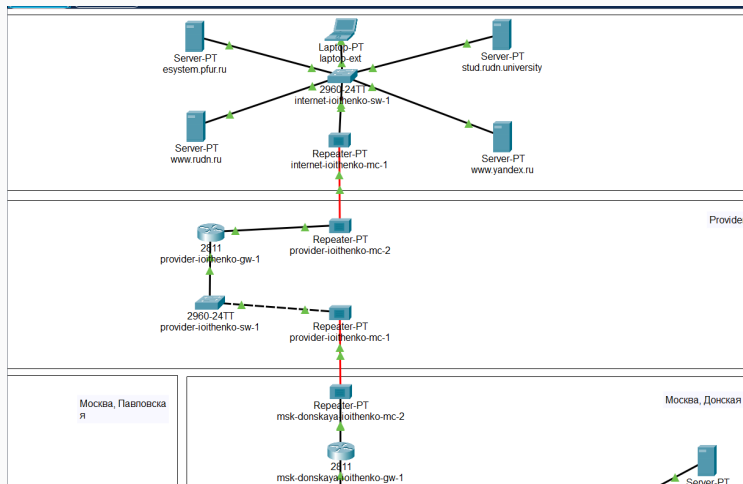
Рис. 10: Добавление ноутбука

laptop-ext

Physical | Config | Desktop | Programming | Attributes

Command Prompt

```
ftp>exit
 Invalid or non supported command.
ftp>

C:\>ping 192.0.2.1

Pinging 192.0.2.1 with 32 bytes of data:

Reply from 192.0.2.1: bytes=32 time<1ms TTL=255
Reply from 192.0.2.1: bytes=32 time<1ms TTL=255
Reply from 192.0.2.1: bytes=32 time<1ms TTL=255
Reply from 192.0.2.1: bytes=32 time<1ms TTL=255

Ping statistics for 192.0.2.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ftp 198.51.100.3
Trying to connect...198.51.100.3
Connected to 198.51.100.3
220- Welcome to PT Ftp server
Username:cisco
331- Username ok, need password
Password:
230- Logged in
(passive mode On)
ftp>

C:\>
```
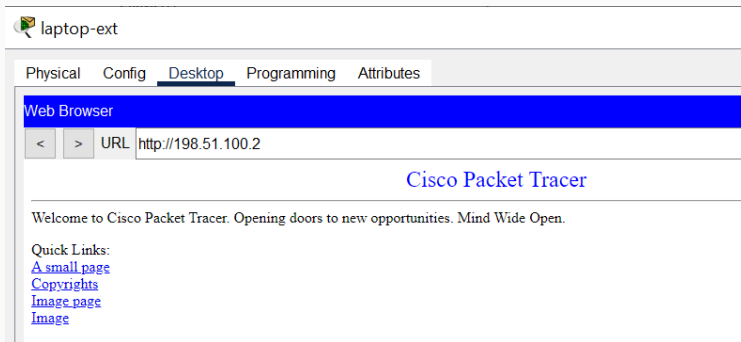
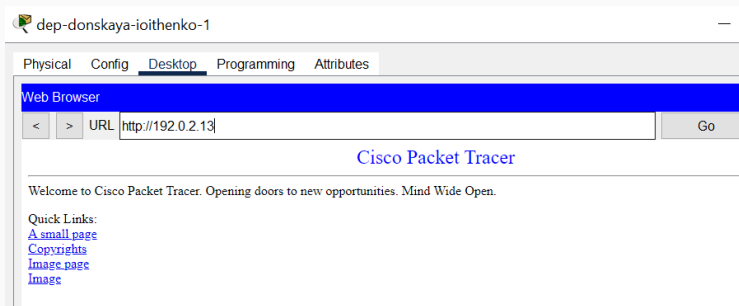Рис. 11: Проверка

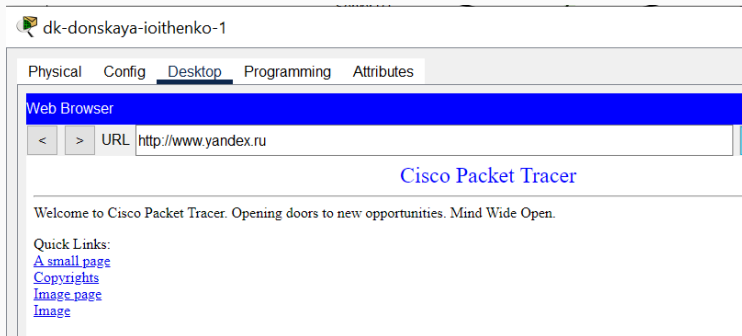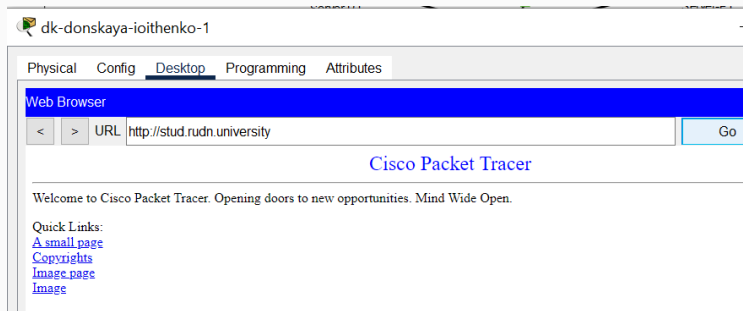**Рис. 12:** Доступ по HTTP

Рис. 13: dep
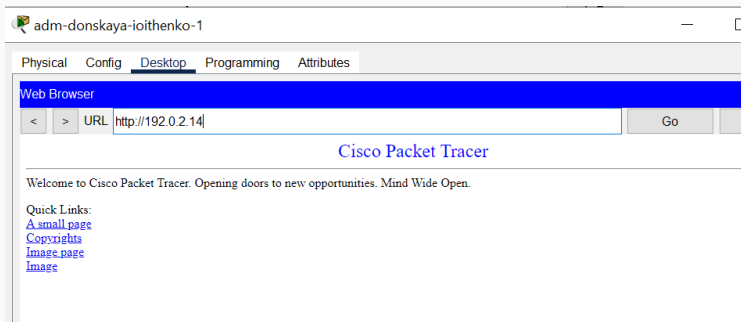
Рис. 14: dk

Рис. 15: dk

Рис. 16: adm

В ходе выполнения лабораторной работы я приобрела практические навыки по настройке доступа локальной сети к внешней сети посредством NAT.