

Лабораторная работа №8

Администрирование локальных сетей

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- Приобретение практических навыков по настройке динамического распределения IP-адресов посредством протокола DHCP (Dynamic Host Configuration Protocol) в локальной сети.

1. Добавить DNS-записи для домена `donskaya.rudn.ru` на сервер `dns`.
2. Настроить DHCP-сервис на маршрутизаторе.
3. Заменить в конфигурации конечных устройствах статическое распределение адресов на динамическое.
4. При выполнении работы необходимо учитывать соглашение об именовании.

Выполнение лабораторной работы

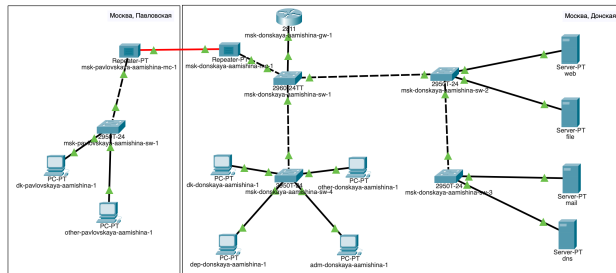


Рис. 1: Логическая схема локальной сети с добавленным DNS-сервером

```
msk-donskaya-aamishina-sw-3>en
Password:
msk-donskaya-aamishina-sw-3#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
msk-donskaya-aamishina-sw-3(config)#interface f0/2
msk-donskaya-aamishina-sw-3(config-if)#switchport mode access
msk-donskaya-aamishina-sw-3(config-if)#switchport access vlan 3
msk-donskaya-aamishina-sw-3(config-if)#exit
msk-donskaya-aamishina-sw-3(config)#exit
msk-donskaya-aamishina-sw-3#
%SYS-5-CONFIG_I: Configured from console by console

msk-donskaya-aamishina-sw-3#
```

Рис. 2: Активация порта

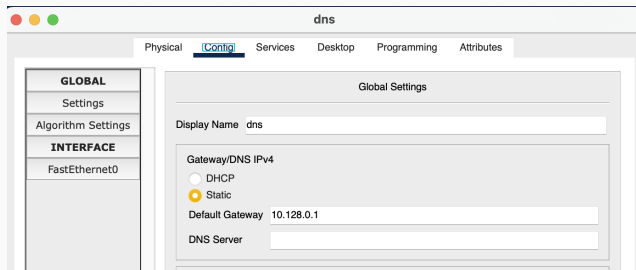


Рис. 3: Конфигурация dns-сервера

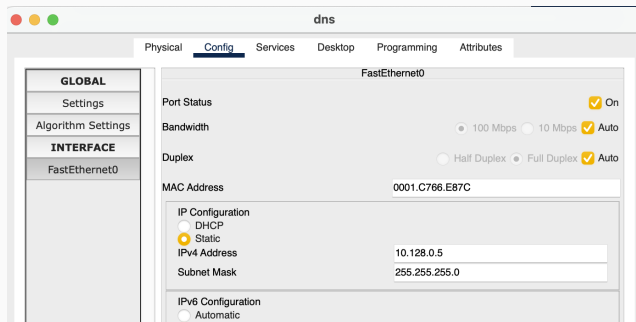


Рис. 4: Конфигурация dns-сервера

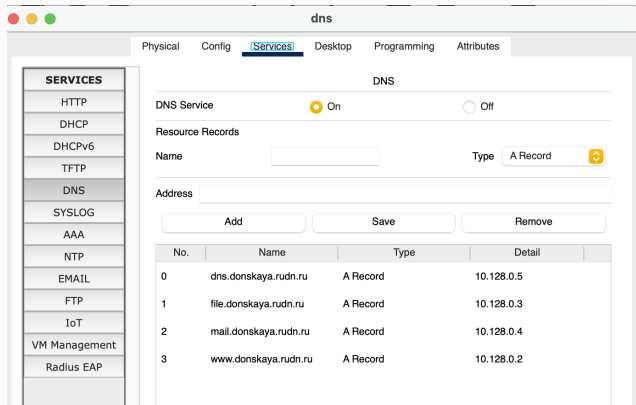


Рис. 5: Окно настройки сервиса DNS

```
msk-donskaya-aamishina-gw-1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
msk-donskaya-aamishina-gw-1(config)#ip name-server 10.128.0.5
msk-donskaya-aamishina-gw-1(config)#service dhcp
msk-donskaya-aamishina-gw-1(config)#ip dhcp pool dk
msk-donskaya-aamishina-gw-1(dhcp-config)#network 10.128.3.0 255.255.255.0
msk-donskaya-aamishina-gw-1(dhcp-config)#default-router 10.128.3.1
msk-donskaya-aamishina-gw-1(dhcp-config)#dns-server 10.128.0.5
msk-donskaya-aamishina-gw-1(dhcp-config)#exit
msk-donskaya-aamishina-gw-1(config)#ip dhcp excluded-address 10.128.3.1 10.128.3.29
msk-donskaya-aamishina-gw-1(config)#ip dhcp excluded-address 10.128.3.200 10.128.3.254
msk-donskaya-aamishina-gw-1(config)#ip dhcp pool departments
msk-donskaya-aamishina-gw-1(dhcp-config)#network 10.128.4.0 255.255.255.0
msk-donskaya-aamishina-gw-1(dhcp-config)#default-router 10.128.4.1
msk-donskaya-aamishina-gw-1(dhcp-config)#dns-server 10.128.0.5
msk-donskaya-aamishina-gw-1(dhcp-config)#exit
msk-donskaya-aamishina-gw-1(config)#ip dhcp excluded-address 10.128.4.1 10.128.4.29
msk-donskaya-aamishina-gw-1(config)#ip dhcp excluded-address 10.128.4.200 10.128.4.254
msk-donskaya-aamishina-gw-1(config)#ip dhcp pool adm
msk-donskaya-aamishina-gw-1(dhcp-config)#network 10.128.5.0 255.255.255.0
msk-donskaya-aamishina-gw-1(dhcp-config)#default-router 10.128.5.1
msk-donskaya-aamishina-gw-1(dhcp-config)#dns-server 10.128.0.5
msk-donskaya-aamishina-gw-1(dhcp-config)#exit
msk-donskaya-aamishina-gw-1(config)#ip dhcp excluded-address 10.128.5.1 10.128.5.29
msk-donskaya-aamishina-gw-1(config)#ip dhcp excluded-address 10.128.5.200 10.128.5.254
msk-donskaya-aamishina-gw-1(config)#ip dhcp pool other
msk-donskaya-aamishina-gw-1(dhcp-config)#network 10.128.6.0 255.255.255.0
msk-donskaya-aamishina-gw-1(dhcp-config)#default-router 10.128.6.1
msk-donskaya-aamishina-gw-1(dhcp-config)#dns-server 10.128.0.5
msk-donskaya-aamishina-gw-1(dhcp-config)#exit
msk-donskaya-aamishina-gw-1(config)#ip dhcp excluded-address 10.128.6.1 10.128.6.29
msk-donskaya-aamishina-gw-1(config)#ip dhcp excluded-address 10.128.6.200 10.128.6.254
msk-donskaya-aamishina-gw-1(config)#exit
```

Рис. 6: Настройка DHCP-сервиса на маршрутизаторе

```
mak-donskaya-samikhina-gw-1#sh ip dhcp pool

Pool dk :
  Utilization mark (high/low) : 100 / 0
  Subnet size (first/next) : 0 / 0
  Total addresses : 254
  Leased addresses : 0
  Excluded addresses : 8
  Pending event : none

1 subnet is currently in the pool
Current index IP address range Leased/Excluded/Total
10.128.3.1 10.128.3.1 - 10.128.3.254 0 / 8 / 254

Pool departments :
  Utilization mark (high/low) : 100 / 0
  Subnet size (first/next) : 0 / 0
  Total addresses : 254
  Leased addresses : 0
  Excluded addresses : 8
  Pending event : none

1 subnet is currently in the pool
Current index IP address range Leased/Excluded/Total
10.128.4.1 10.128.4.1 - 10.128.4.254 0 / 8 / 254

Pool edm :
  Utilization mark (high/low) : 100 / 0
  Subnet size (first/next) : 0 / 0
  Total addresses : 254
  Leased addresses : 0
  Excluded addresses : 8
  Pending event : none

1 subnet is currently in the pool
Current index IP address range Leased/Excluded/Total
10.128.5.1 10.128.5.1 - 10.128.5.254 0 / 8 / 254

Pool other :
  Utilization mark (high/low) : 100 / 0
  Subnet size (first/next) : 0 / 0
  Total addresses : 254
  Leased addresses : 0
  Excluded addresses : 8
  Pending event : none

1 subnet is currently in the pool
Current index IP address range Leased/Excluded/Total
10.128.6.1 10.128.6.1 - 10.128.6.254 0 / 8 / 254
mak-donskaya-samikhina-gw-1#
```

Рис. 7: Информация о пулах DHCP

```
msk-donskaya-aamishina-gw-1#  
msk-donskaya-aamishina-gw-1#sh ip dhcp binding  
IP address      Client-ID/      Lease expiration      Type  
                Hardware address  
msk-donskaya-aamishina-gw-1#
```

Рис. 8: Информация о привязках выданных адресов

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

FastEthernet0 Connection:(default port)

    Connection-specific DNS Suffix.:
    Link-local IPv6 Address.....: FE80::20C:85FF:FEBB:ACBA
    IPv6 Address.....: ::
    IPv4 Address.....: 10.128.3.3
    Subnet Mask.....: 255.255.255.0
    Default Gateway.....: ::
                           10.128.3.1
```

Рис. 9: Просмотр статического ip-адреса

```
C:\>ipconfig /all

FastEthernet0 Connection: (default port)

    Connection-specific DNS Suffix...:
    Physical Address.....: 000C.85BB.ACBA
    Link-local IPv6 Address.....: FE80::20C:85FF:FE8B:ACBA
    IPv6 Address.....: ::
    IPv4 Address.....: 10.128.3.30
    Subnet Mask.....: 255.255.255.0
    Default Gateway.....: ::
                           10.128.3.1
    DHCP Servers.....: 10.128.3.1
    DHCPv6 IAID.....:
    DHCPv6 Client DUID.....: 00-01-00-01-77-A5-97-31-00-0C-85-BB-AC-BA
    DNS Servers.....: ::
                           10.128.0.5

Bluetooth Connection:

    Connection-specific DNS Suffix...:
    Physical Address.....: 000D.BDE0.1B13
    Link-local IPv6 Address.....: ::

C:\>
```

Рис. 10: Просмотр динамически заданного ip-адреса

```
C:\>
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 = 0ms, Average = 0ms

C:\>ping www.donskaya.rudn.ru

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

Ping statistics for 10.128.0.2:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>
```

Рис. 11: Проверка доступности устройств из разных подсетей

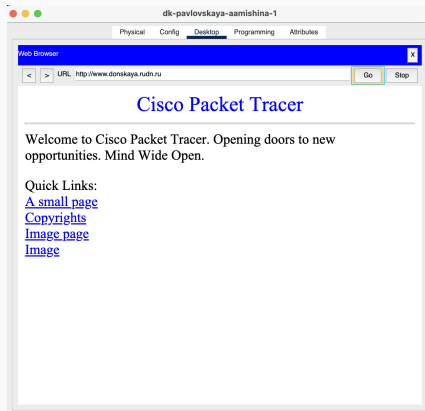


Рис. 12: Информация по адресу www.donskaya.rudn.ru

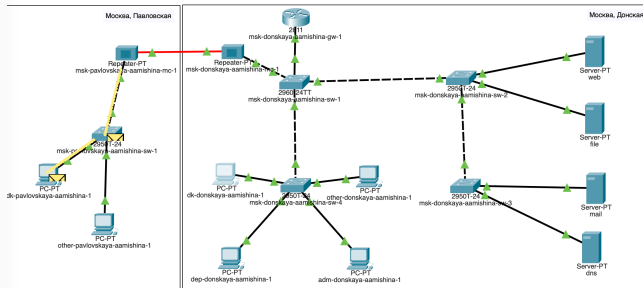


Рис. 13: Запрос адреса по протоколу DHCP в режиме симуляции

Event List				
Vis.	Time(sec)	Last Device	At Device	Type
	0.000	--	dk-donskaya-aamishina-1	DHCP
	0.000	--	dk-donskaya-aamishina-1	DHCP
	0.001	dk-donskaya-aamishina-1	msk-donskaya-aamishina-sw-4	DHCP
	0.001	--	dk-donskaya-aamishina-1	DHCP
	0.002	dk-donskaya-aamishina-1	msk-donskaya-aamishina-sw-4	DHCP
	0.002	msk-donskaya-aamishina-sw-4	msk-donskaya-aamishina-sw-1	DHCP
	0.003	msk-donskaya-aamishina-sw-4	msk-donskaya-aamishina-sw-1	DHCP
	0.003	msk-donskaya-aamishina-sw-1	msk-donskaya-aamishina-mc-1	DHCP
	0.003	msk-donskaya-aamishina-sw-1	msk-donskaya-aamishina-gw-1	DHCP
	0.003	msk-donskaya-aamishina-sw-1	msk-donskaya-aamishina-sw-2	DHCP
	0.004	msk-donskaya-aamishina-sw-1	msk-donskaya-aamishina-mc-1	DHCP
	0.004	msk-donskaya-aamishina-sw-1	msk-donskaya-aamishina-gw-1	DHCP
	0.004	msk-donskaya-aamishina-sw-1	msk-donskaya-aamishina-sw-2	DHCP
	0.004	msk-donskaya-aamishina-mc-1	msk-pavlovskaya-aamishina-mc-1	DHCP
	0.004	msk-donskaya-aamishina-sw-2	msk-donskaya-aamishina-sw-3	DHCP

Рис. 14: Список событий по DHCP запросу

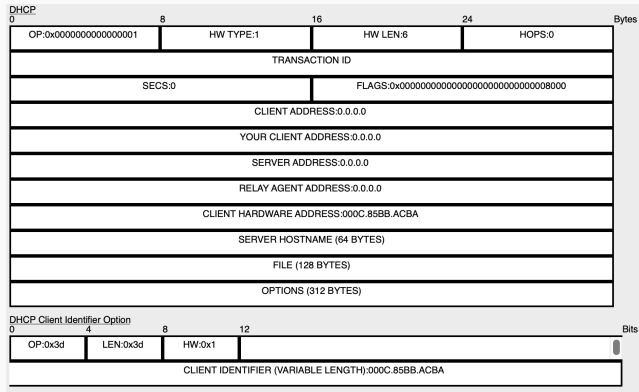


Рис. 15: DHCP-запрос на выделение адреса. Заголовки пакета

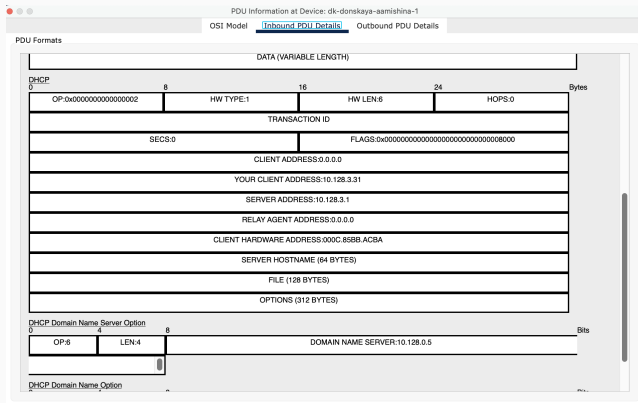


Рис. 16: DHCP-ответ с выделенным адресом. Заголовки пакета

- В результате выполнения лабораторной работы я приобрела практические навыки по настройке динамического распределения IP-адресов посредством протокола DHCP (Dynamic Host Configuration Protocol) в локальной сети.