

Лабораторная работа №8

Настройка сетевых сервисов DHCP

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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

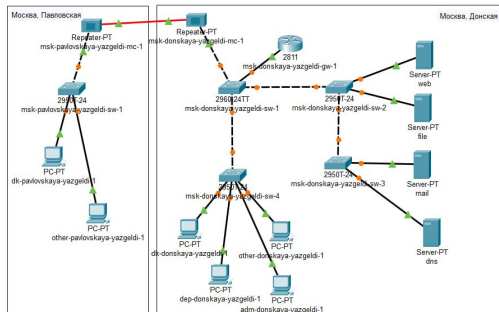


Рис. 1: Логическая схема локальной сети

```
msk-donskaya-yazgeldi-sw-3>en
Password:
msk-donskaya-yazgeldi-sw-3#conf t
Enter configuration commands, one per line. End with CNTL/Z.
msk-donskaya-yazgeldi-sw-3(config)#interface f0/2
msk-donskaya-yazgeldi-sw-3(config-if)#switchport mode access
msk-donskaya-yazgeldi-sw-3(config-if)#switchport access vlan 3
msk-donskaya-yazgeldi-sw-3(config-if)#exit
```

Рис. 2: Активация порта

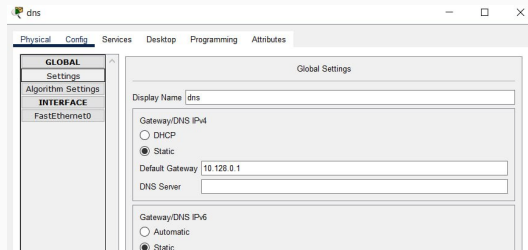


Рис. 3: Конфигурация ДНС сервера

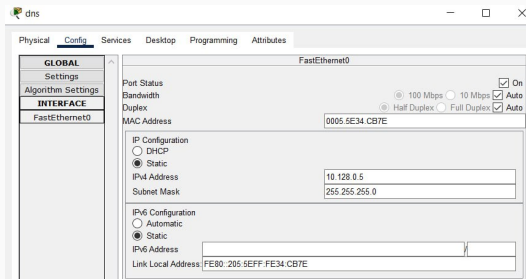


Рис. 4: Конфигурация ДНС сервера

```
msk-donskaya-yazgeldi-gw-1#en
Password:
msk-donskaya-yazgeldi-gw-1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
msk-donskaya-yazgeldi-gw-1(config)#ip name-server 10.128.0.5
msk-donskaya-yazgeldi-gw-1(config)#service dhcp
msk-donskaya-yazgeldi-gw-1(config)#ip dhcp pool dk
msk-donskaya-yazgeldi-gw-1(dhcp-config)#network 10.128.3.0 255.255.255.0
msk-donskaya-yazgeldi-gw-1(dhcp-config)#default-router 10.128.3.1
msk-donskaya-yazgeldi-gw-1(dhcp-config)#dns-server 10.128.0.5
msk-donskaya-yazgeldi-gw-1(dhcp-config)#exit
msk-donskaya-yazgeldi-gw-1(config)#ip dhcp excluded-address 10.128.3.1 10.128.3.29
msk-donskaya-yazgeldi-gw-1(config)#ip dhcp excluded-address 10.128.3.200 10.128.3.254
msk-donskaya-yazgeldi-gw-1(config)#
```

Рис. 5: Настройка DHCP-сервиса

```
msk-donskaya-yazgeldi-gw-1(config)#ip dhcp pool departments
msk-donskaya-yazgeldi-gw-1(dhcp-config)#network 10.128.4.0 255.255.255.0
msk-donskaya-yazgeldi-gw-1(dhcp-config)#default-router 10.128.4.1
msk-donskaya-yazgeldi-gw-1(dhcp-config)#dns-server 10.128.0.5
msk-donskaya-yazgeldi-gw-1(dhcp-config)#exit
msk-donskaya-yazgeldi-gw-1(config)#ip dhcp excluded-address 10.128.4.1 10.128.4.29
msk-donskaya-yazgeldi-gw-1(config)#ip dhcp excluded-address 10.128.4.200 10.128.4.254
msk-donskaya-yazgeldi-gw-1(config)#ip dhcp pool adm
msk-donskaya-yazgeldi-gw-1(dhcp-config)#network 10.128.5.0 255.255.255.0
msk-donskaya-yazgeldi-gw-1(dhcp-config)#default-router 10.128.5.1
msk-donskaya-yazgeldi-gw-1(dhcp-config)#dns-server 10.128.0.5
msk-donskaya-yazgeldi-gw-1(dhcp-config)#exit
msk-donskaya-yazgeldi-gw-1(config)#ip dhcp excluded-address 10.128.5.1 10.128.5.29
msk-donskaya-yazgeldi-gw-1(config)#ip dhcp excluded-address 10.128.5.200 10.128.5.254
msk-donskaya-yazgeldi-gw-1(config)#ip dhcp pool other
msk-donskaya-yazgeldi-gw-1(dhcp-config)#network 10.128.6.0 255.255.255.0
msk-donskaya-yazgeldi-gw-1(dhcp-config)#default-router 10.128.6.1
msk-donskaya-yazgeldi-gw-1(dhcp-config)#dns-server 10.128.0.6
msk-donskaya-yazgeldi-gw-1(dhcp-config)#exit
msk-donskaya-yazgeldi-gw-1(config)#ip dhcp excluded-address 10.128.6.1 10.128.6.29
msk-donskaya-yazgeldi-gw-1(config)#ip dhcp excluded-address 10.128.6.200 10.128.6.254
msk-donskaya-yazgeldi-gw-1(config)#exit
msk-donskaya-yazgeldi-gw-1#
```

Рис. 6: Настройка DHCP-сервиса

```
msk-donskaya-yazgeldi-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 adm :
  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
```

Рис. 7: Информация о пулах DHCP

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

Рис. 8: Информация о привязанных адресах

```
C:\>ipconfig

FastEthernet0 Connection: (default port)

    Connection-specific DNS Suffix...:
    Link-local IPv6 Address . . . . .: FE80::209:7CFF:FE1A:1CD3
    IPv6 Address . . . . . : ::
    IPv4 Address . . . . . : 10.128.3.201
    Subnet Mask . . . . . : 255.255.255.0
    Default Gateway . . . . . : ::
                                10.128.3.1
```

Рис. 9: Статические адреса в терминале

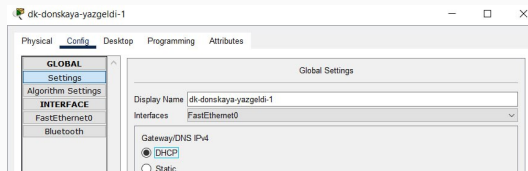


Рис. 10: Замена в настройках статическое распределение адресов на динамическое

```
FastEthernet0 Connection:(default port)

Connection-specific DNS Suffix.:
Physical Address.....: 0009.7C1A.1CD3
Link-local IPv6 Address.....: FE80::209:7CFF:FE1A:1CD3
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-B7-72-66-4D-00-09-7C-1A-1C-D3
DNS Servers.....: ::
                        10.128.0.5
```

Рис. 11: Просмотр динамически заданного адреса


```
C:\>ping 10.128.5.31

Pinging 10.128.5.31 with 32 bytes of data:

Reply from 10.128.5.31: bytes=32 time=12ms TTL=127
Reply from 10.128.5.31: bytes=32 time<1ms TTL=127
Reply from 10.128.5.31: bytes=32 time<1ms TTL=127
Reply from 10.128.5.31: bytes=32 time<1ms TTL=127

Ping statistics for 10.128.5.31:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 12ms, Average = 3ms
```

Рис. 12: Проверка доступности

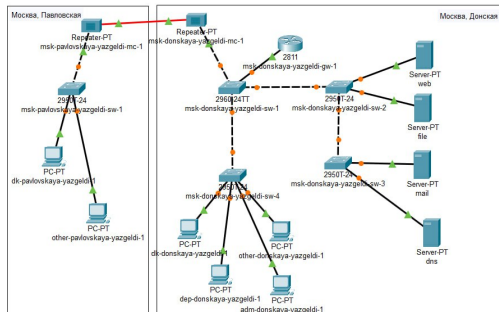


Рис. 13: Запрос адреса по протоколу DHCP

Simulation Panel				
Event List				
Vis.	Time(sec)	Last Device	At Device	Type
	0.003	msk-pavlovskaya-yazgeldi-sw-1	msk-pavlovskaya-yazgeldi-mc-1	DHCP
	0.004	msk-pavlovskaya-yazgeldi-mc-1	msk-donskaya-yazgeldi-mc-1	DHCP
	0.005	msk-donskaya-yazgeldi-mc-1	msk-donskaya-yazgeldi-sw-1	DHCP
	0.006	msk-donskaya-yazgeldi-sw-1	msk-donskaya-yazgeldi-gw-1	DHCP
	0.006	msk-donskaya-yazgeldi-sw-1	msk-donskaya-yazgeldi-sw-2	DHCP
	0.006	msk-donskaya-yazgeldi-sw-1	msk-donskaya-yazgeldi-sw-4	DHCP
	0.007	msk-donskaya-yazgeldi-sw-2	msk-donskaya-yazgeldi-sw-3	DHCP
	0.007	msk-donskaya-yazgeldi-sw-4	other-donskaya-yazgeldi-1	DHCP
	1.510	msk-donskaya-yazgeldi-gw-1	msk-donskaya-yazgeldi-sw-1	DHCP
	1.511	msk-donskaya-yazgeldi-sw-1	msk-donskaya-yazgeldi-mc-1	DHCP
	1.511	msk-donskaya-yazgeldi-sw-1	msk-donskaya-yazgeldi-sw-2	DHCP
	1.511	msk-donskaya-yazgeldi-sw-1	msk-donskaya-yazgeldi-sw-4	DHCP
	1.512	msk-donskaya-yazgeldi-mc-1	msk-pavlovskaya-yazgeldi-mc-1	DHCP
	1.512	msk-donskaya-yazgeldi-sw-2	msk-donskaya-yazgeldi-sw-3	DHCP
	1.512	msk-donskaya-yazgeldi-sw-4	other-donskaya-yazgeldi-1	DHCP
	1.513	msk-pavlovskaya-yazgeldi-mc-1	msk-pavlovskaya-yazgeldi-sw-1	DHCP
	1.514	msk-pavlovskaya-yazgeldi-sw-1	other-pavlovskaya-yazgeldi-1	DHCP
	1.515	other-pavlovskaya-yazgeldi-1	msk-pavlovskaya-yazgeldi-sw-1	DHCP

Рис. 14: Запрос адреса по протоколу DHCP

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