

Лабораторная работа № 8

Настройка сетевых сервисов.DHCP

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Приобрести практические навыки 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.

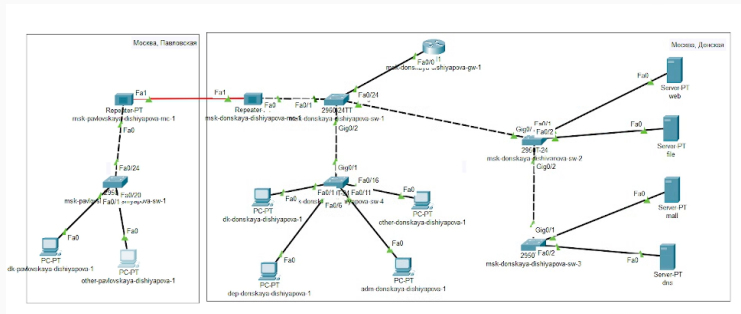


Рис. 1: Логическая схема локальной сети с добавленным DNS-сервером

```

Password:

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

Рис. 2: Активация порта

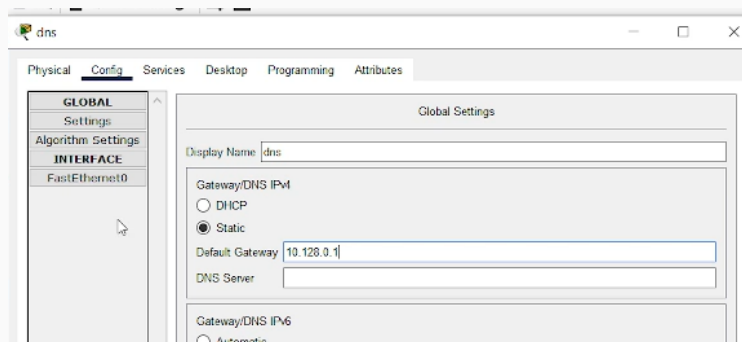


Рис. 3: Конфигурация dns-сервера

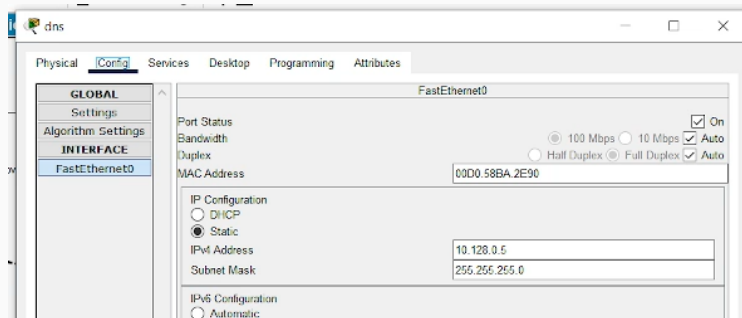


Рис. 4: Конфигурация dns-сервера

Services Desktop Programming Attributes

DNS

DNS Service ☒ On ☐ Off

Resource Records

Name Type A Record

Address

Add Save Remove

No.	Name	Type	Detail
0	dns.donskaya.rudn.ru	A Record	10.128.0.5
1	file.donskaya.rudn.ru	A Record	10.128.0.3
2	mail.donskaya.rudn.ru	A Record	10.128.0.4
3	www.donskaya.rudn.ru	A Record	10.128.0.2

Рис. 5: Окно настройки сервиса DNS

```

Password:
msk-donakaya-dishiyapova-gw-1>enable
Password:
msk-donskaya-dishiyapova-gw-1#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
msk-donskaya-dishiyapova-gw-1(config)#ip name server 10.128.0.5
      ^
% Invalid input detected at '^' marker.

msk-donskaya-dishiyapova-gw-1(config)#ip name-server 10.128.0.5
msk-donskaya-dishiyapova-gw-1(config)#service dhcp
msk-donskaya-dishiyapova-gw-1(config)#ip dhcp pool dk
msk-donskaya-dishiyapova-gw-1(dhcp-config)#network 10.128.3.0 255.255.255.0
msk-donskaya-dishiyapova-gw-1(dhcp-config)#default-router 10.128.3.1
      ^
% Invalid input detected at '^' marker.

msk-donskaya-dishiyapova-gw-1(dhcp-config)#default-router 10.128.3.1
msk-donskaya-dishiyapova-gw-1(dhcp-config)#dns-server 10.128.0.5
msk-donskaya-dishiyapova-gw-1(dhcp-config)#exit
msk-donskaya-dishiyapova-gw-1(config)#ip dhcp excluded address 10.128.3.1 10.128.3.29
      ^
% Invalid input detected at '^' marker.

msk-donskaya-dishiyapova-gw-1(config)#ip dhcp excluded-address 10.128.3.1 10.128.3.29
msk-donskaya-dishiyapova-gw-1(config)#ip dhcp excluded-address 10.128.3.200 10.128.3.254
msk-donskaya-dishiyapova-gw-1(config)#ip dhcp pool departments
msk-donskaya-dishiyapova-gw-1(dhcp-config)#network 10.128.4.0 255.255.255.0
msk-donskaya-dishiyapova-gw-1(dhcp-config)#default-router 10.128.4.1
msk-donskaya-dishiyapova-gw-1(dhcp-config)#dnsserver 10.128.0.5
      ^
% Invalid input detected at '^' marker.
```

```
mak-donskaya-dishiyapova-gw-1(dhcp-config)#dns-server 10.128.0.5
mak-donskaya-dishiyapova-gw-1(dhcp-config)#exit
mak-donskaya-dishiyapova-gw-1(config)#ip dhcp excluded address 10.128.4.1 10.128.4.29
^
% Invalid input detected at '^' marker.

mak-donskaya-dishiyapova-gw-1(config)#ip dhcp excluded-address 10.128.4.1 10.128.4.29
mak-donskaya-dishiyapova-gw-1(config)#ip dhcp excluded-address 10.128.4.200 10.128.4.254
mak-donskaya-dishiyapova-gw-1(config)#ip dhcp pool adm
mak-donskaya-dishiyapova-gw-1(dhcp-config)#network 10.128.5.0 255.255.255.0
mak-donskaya-dishiyapova-gw-1(dhcp-config)#default router 10.128.5.1
^
% Invalid input detected at '^' marker.

mak-donskaya-dishiyapova-gw-1(dhcp-config)#default-router 10.128.5.1
mak-donskaya-dishiyapova-gw-1(dhcp-config)#dnsserver 10.128.0.5
^
% Invalid input detected at '^' marker.

mak-donskaya-dishiyapova-gw-1(dhcp-config)#dns-server 10.128.0.5
mak-donskaya-dishiyapova-gw-1(dhcp-config)#exit
mak-donskaya-dishiyapova-gw-1(config)#ip dhcp excluded address 10.128.5.1 10.128.5.29
^
% Invalid input detected at '^' marker.

mak-donskaya-dishiyapova-gw-1(config)#ip dhcp excluded-address 10.128.5.1 10.128.5.29
mak-donskaya-dishiyapova-gw-1(config)#ip dhcp excluded-address 10.128.5.200 10.128.5.254
mak-donskaya-dishiyapova-gw-1(config)#ip dhcp pool other
mak-donskaya-dishiyapova-gw-1(dhcp-config)#network 10.128.6.0 255.255.255.0
mak-donskaya-dishiyapova-gw-1(dhcp-config)#default router 10.128.6.1
^
% Invalid input detected at '^' marker.

mak-donskaya-dishiyapova-gw-1(dhcp-config)#default-router 10.128.6.1
mak-donskaya-dishiyapova-gw-1(dhcp-config)#dns-server 10.128.0.5
mak-donskaya-dishiyapova-gw-1(dhcp-config)#exit
mak-donskaya-dishiyapova-gw-1(config)#ip dhcp excluded address 10.128.6.1 10.128.6.29
^
% Invalid input detected at '^' marker.

mak-donskaya-dishiyapova-gw-1(config)#ip dhcp excluded-address 10.128.6.1 10.128.6.29
mak-donskaya-dishiyapova-gw-1(config)#ip dhcp excluded-address 10.128.6.200 10.128.6.254
```

Выполнение лабораторной работы

```
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

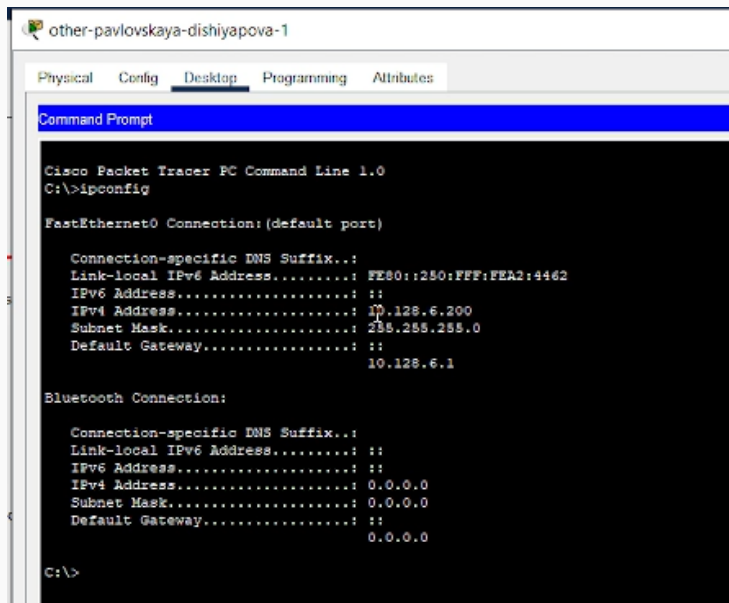
Pool other :
Utilization mark (high/low) : 100 / 0
Subnet size (first/next)    : 0 / 0
Total addresses             : 254
Leased addresses            : 0
Excluded addresses          : 8
Pending event               : none

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-donakaya-dishiyapova-gw-lfsh ip dhcp binding
```

```
Current index      IP address range
10.128.6.1         10.128.6.1 - 10.128.6.254
mak-donakaya-dishiyapova-gw-1#sh ip dhcp binding
IP address         Client-ID/          Lease expires
                   Hardware address
mak-donakaya-dishiyapova-gw-1#
```

Рис. 9: Информация о привязках выданных адресов

Выполнение лабораторной работы



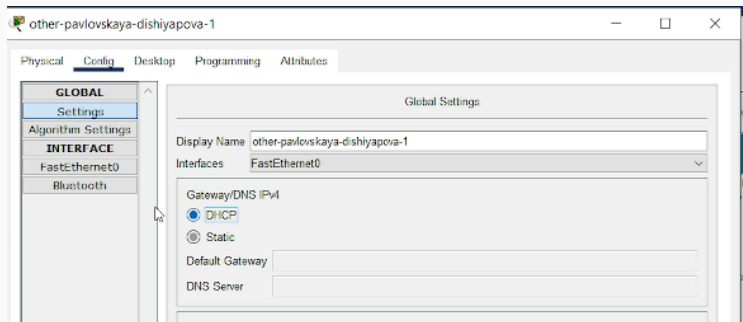


Рис. 11: Замена в настройках статического распределения адресов на динамическое

```
Default Gateway.....: ::  
                                0.0.0.0  
  
C:\>ipconfig  
  
FastEthernet0 Connection: (default port)  
  
    Connection-specific DNS Suffix...:  
    Link-local IPv6 Address.....: FE80::207:ECFF:FE60:7B99  
    IPv6 Address.....: ::  
    IPv4 Address.....: 10.128.6.31  
    Subnet Mask.....: 255.255.255.0  
    Default Gateway.....: ::  
                                10.128.6.1  
  
Bluetooth Connection:  
  
    Connection-specific DNS Suffix...:  
    Link-local IPv6 Address.....: FE80::207:ECFF:FE60:7B99  
    IPv6 Address.....: ::  
    IPv4 Address.....: 10.128.6.31  
    Subnet Mask.....: 255.255.255.0  
    Default Gateway.....: ::  
                                10.128.6.1
```

Рис. 12: Просмотр динамически заданного ip-адреса


```
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=127
Reply from 10.128.3.30: bytes=32 time<1ms TTL=127
Reply from 10.128.3.30: bytes=32 time<1ms TTL=127
Reply from 10.128.3.30: bytes=32 time=11ms TTL=127

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 = 11ms, Average = 2ms

C:\>|
```

Рис. 13: Проверка доступности устройств из разных подсетей

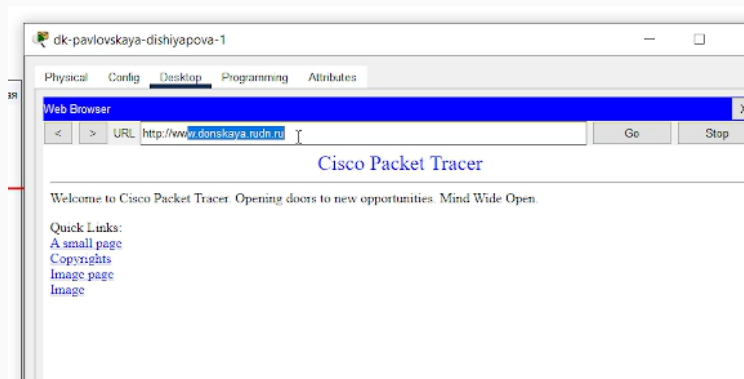


Рис. 14: Информация по адресу www.donskaya.rudn.ru

Выполнение лабораторной работы

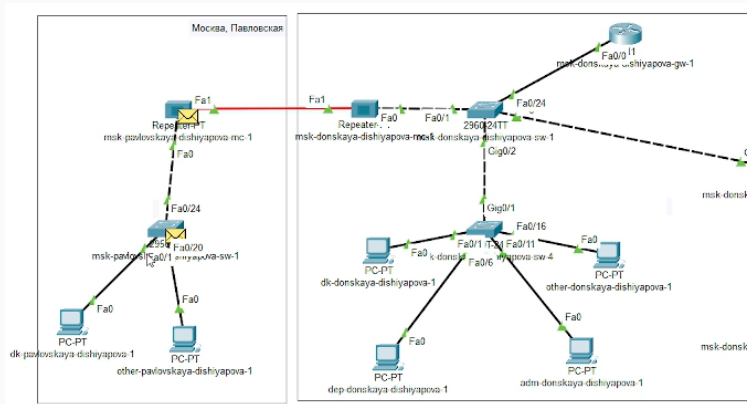


Рис. 15: Запрос адреса по протоколу DHCP в режиме симуляции

Simulation Panel

Event List

Vis.	Time(sec)	Last Device	At Device	Type
	0.003	msk-pavlovskaya-dishiyapova-sw-1	msk-pavlovskaya-dishiyapova-mc-1	DHCP
	0.003	msk-pavlovskaya-dishiyapova-mc-1	msk-donskaya-dishiyapova-mc-1	DHCP
	0.004	msk-pavlovskaya-dishiyapova-mc-1	msk-donskaya-dishiyapova-mc-1	DHCP
	0.004	msk-donskaya-dishiyapova-mc-1	msk-donskaya-dishiyapova-sw-1	DHCP
	0.005	msk-donskaya-dishiyapova-mc-1	msk-donskaya-dishiyapova-sw-1	DHCP
	0.005	msk-donskaya-dishiyapova-sw-1	msk-donskaya-dishiyapova-gw-1	DHCP
	0.005	msk-donskaya-dishiyapova-sw-1	msk-donskaya-dishiyapova-sw-2	DHCP
	0.005	msk-donskaya-dishiyapova-sw-1	msk-donskaya-dishiyapova-sw-4	DHCP
	0.006	msk-donskaya-dishiyapova-sw-1	msk-donskaya-dishiyapova-gw-1	DHCP
	0.006	msk-donskaya-dishiyapova-sw-1	msk-donskaya-dishiyapova-sw-2	DHCP
	0.006	msk-donskaya-dishiyapova-sw-1	msk-donskaya-dishiyapova-sw-4	DHCP
	0.006	msk-donskaya-dishiyapova-sw-4	dk-donskaya-dishiyapova-1	DHCP
	0.007	msk-donskaya-dishiyapova-sw-4	dk-donskaya-dishiyapova-1	DHCP
	1.513	msk-donskaya-dishiyapova-gw-1	msk-donskaya-dishiyapova-sw-1	DHCP
	1.514	msk-donskaya-dishiyapova-sw-1	msk-donskaya-dishiyapova-mc-1	DHCP
	1.514	msk-donskaya-dishiyapova-sw-1	msk-donskaya-dishiyapova-sw-2	DHCP
	1.514	msk-donskaya-dishiyapova-sw-1	msk-donskaya-dishiyapova-sw-4	DHCP
	1.515	msk-donskaya-dishiyapova-mc-1	msk-pavlovskaya-dishiyapova-mc-1	DHCP
	1.515	msk-donskaya-dishiyapova-sw-4	dk-donskaya-dishiyapova-1	DHCP

Reset Simulation ☒ Constant Delay

Captured to: 1.515 s

Рис. 16: Список событий по DHCP запросу

DHCP запрос на выделение адреса. Заголовки пакета

Рис. 17: DHCP запрос на выделение адреса. Заголовки пакета

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