

# Лабораторная работа №8

Администрирование локальных сетей

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Ищенко Ирина

Российский университет дружбы народов, Москва, Россия

- Ищенко Ирина Олеговна
- 1132226529
- уч. группа: НПИбд-02-22
- Факультет физико-математических и естественных наук

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

## Выполнение лабораторной работы

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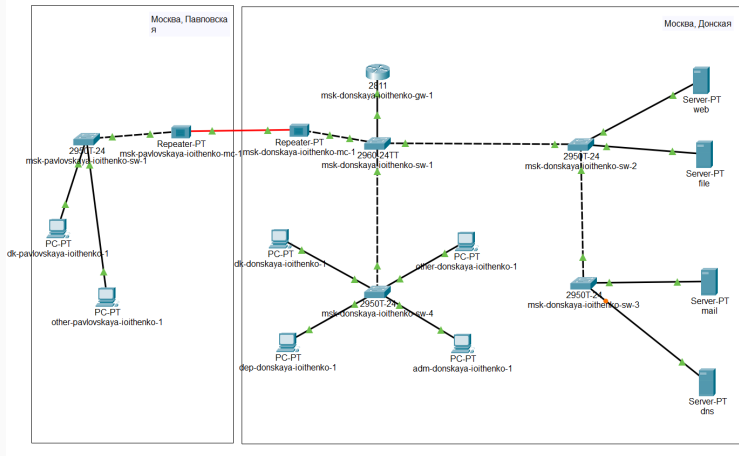


Рис. 1: Добавление сервера

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

Рис. 2: Активация порта

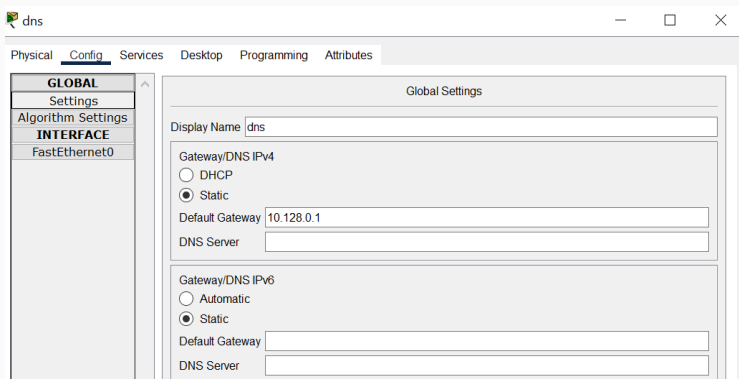


Рис. 3: Шлюз

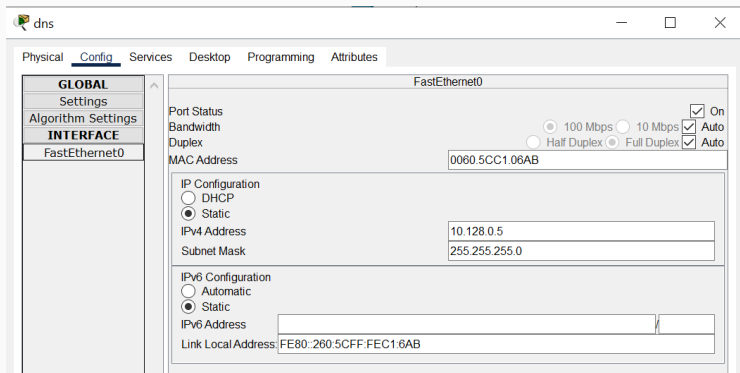


Рис. 4: Адрес сервера



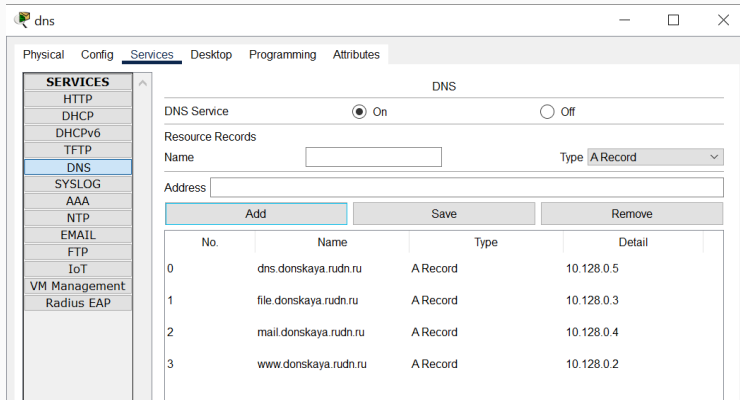


Рис. 5: DNS

```

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

```

Рис. 6: DHCP

```

msk-donskaya-ioithenko-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

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

```

Рис. 7: Пулы и привязки выданных адресов

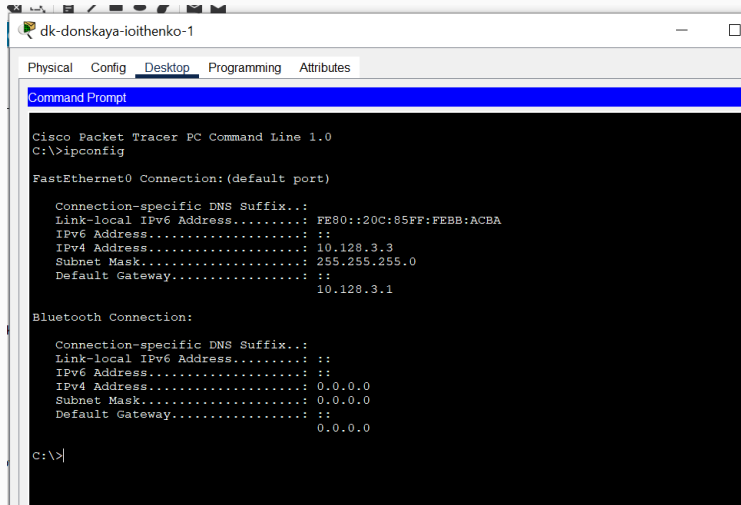


Рис. 8: Статический адрес

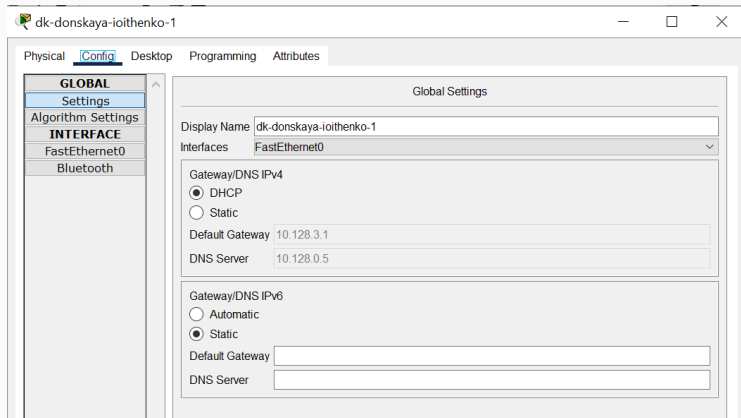


Рис. 9: Замена распределения

```
C:\>ipconfig

FastEthernet0 Connection: (default port)

    Connection-specific DNS Suffix...:
    Link-local IPv6 Address.....: FE80::20C:85FF:FEBB:ACBA
    IPv6 Address.....: ::
    IPv4 Address.....: 10.128.3.30
    Subnet Mask.....: 255.255.255.0
    Default Gateway.....: ::
                           10.128.3.1

Bluetooth Connection:

    Connection-specific DNS Suffix...:
    Link-local IPv6 Address.....: ::
    IPv6 Address.....: ::
    IPv4 Address.....: 0.0.0.0
    Subnet Mask.....: 0.0.0.0
    Default Gateway.....: ::
                           0.0.0.0

C:\>
```

Рис. 10: Динамический адрес

```
C:\>ping 10.128.6.31

Pinging 10.128.6.31 with 32 bytes of data:

Request timed out.
Reply from 10.128.6.31: bytes=32 time<1ms TTL=127
Reply from 10.128.6.31: bytes=32 time=1ms TTL=127
Reply from 10.128.6.31: bytes=32 time=1ms TTL=127

Ping statistics for 10.128.6.31:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, 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=14ms 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 = 14ms, Average = 4ms

C:\>
```

Рис. 11: Доступность устройств

## PDU Formats

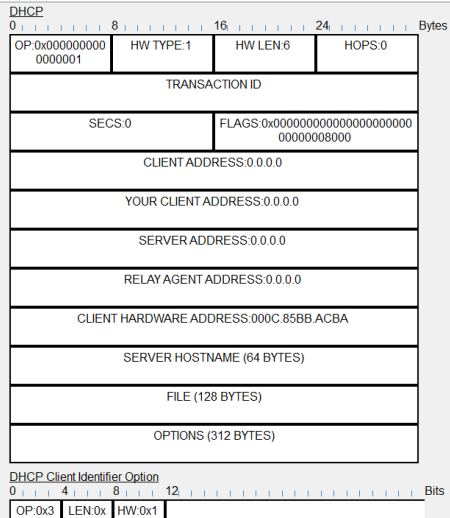


Рис. 12: DHCP-пакет



## PDU Formats

## DHCP

0		8		16		24		Bytes
OP:0x00000000 0000002		HW TYPE:1		HW LEN:6		HOPS:0		
TRANSACTION ID								
SECS:0				FLAGS:0x00000000000000000000 00000008000				
CLIENT ADDRESS:0.0.0.0								
YOUR CLIENT ADDRESS:10.128.3.30								
SERVER ADDRESS:10.128.3.1								
RELAY AGENT ADDRESS:0.0.0.0								
CLIENT HARDWARE ADDRESS:000C.85BB.ACBA								
SERVER HOSTNAME (64 BYTES)								
FILE (128 BYTES)								
OPTIONS (312 BYTES)								

DHCP Domain Name Server Option

Рис. 13: DHCP-пакет

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