Лабораторная работа №3
Администрирование сетевых сервисов

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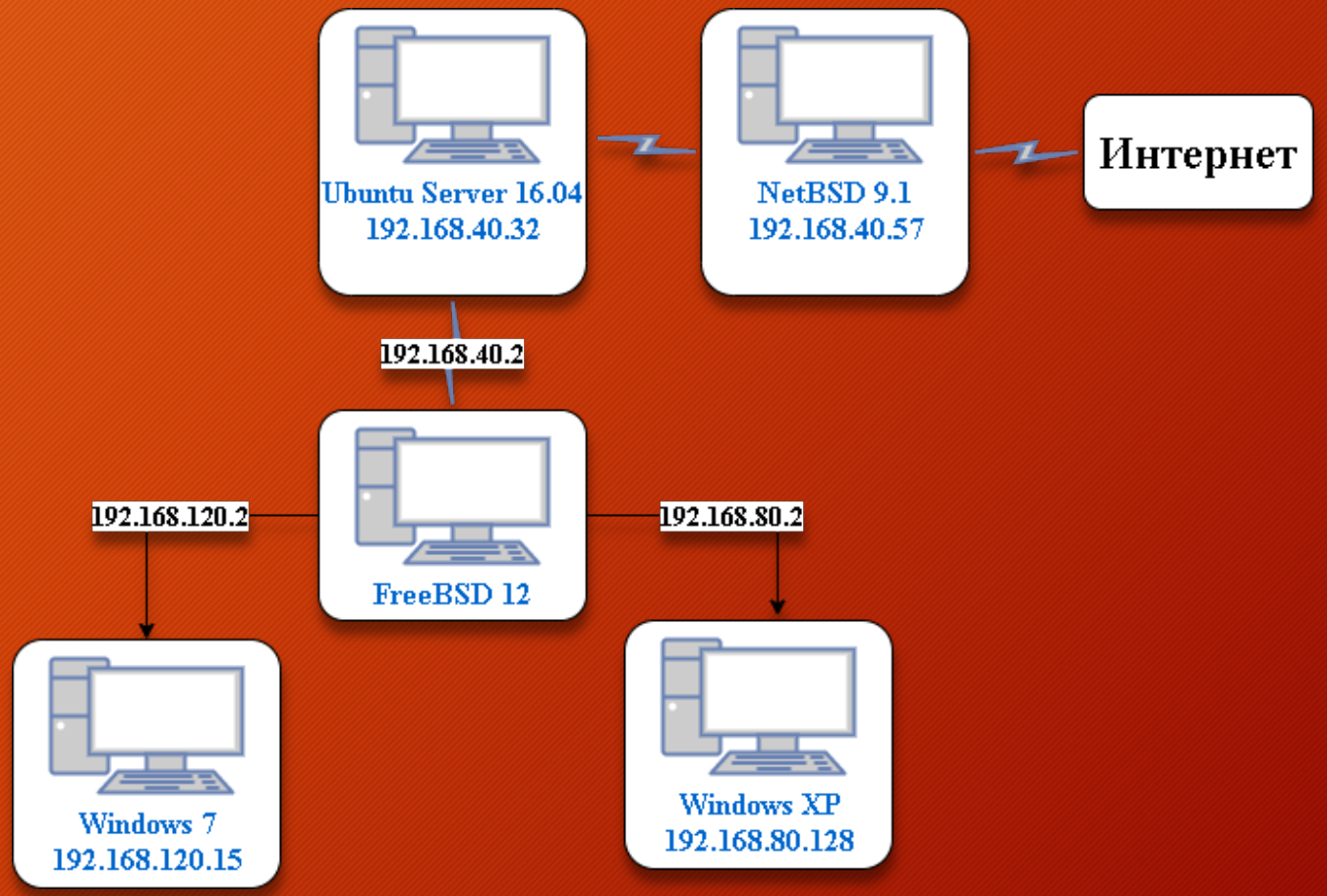
Цели работы

- Изучение технологий сетевых сервисов;
- Реализация технологий сетевых сервисов в виртуальной сети.

Схема ККС


Ubuntu Server 16.04
192.168.40.32
NetBSD 9.1
192.168.40.57
Интернет
192.168.40.2
192.168.120.2
FreeBSD 12
192.168.80.2
Windows 7
192.168.120.15
Windows XP
192.168.80.128

Создание DHCP-серверов (FreeBSD)

- Установка сервера

```
root@:~ # pkg search "isc-dhcp.*-server"
The package management tool is not yet installed on your system.
Do you want to fetch and install it now? [y/N]: y
Bootstrapping pkg from pkg+http://pkg.FreeBSD.org/FreeBSD:12:amd64/quarterly, pl
ease wait...
Verifying signature with trusted certificate pkg.freebsd.org.2013102301... done
Installing pkg-1.16.3...
Extracting pkg-1.16.3: 100%
pkg: Repository FreeBSD missing. 'pkg update' required
isc-dhcp44-server-4.4.2_1      ISC Dynamic Host Configuration Protocol server
```

Создание DHCP-серверов (FreeBSD)

- Редактирование файла /etc/rc.conf

```
root@:~ # cat /etc/rc.conf
hostname=""
dhcpd_enable="YES"
dhcpd_flags="-q"
dhcpd_ifaces="em2"
dhcpd_conf="/usr/local/etc/dhcpd.conf"
ifconfig_em0="inet 192.168.40.2 netmask 255.255.255.0"
ifconfig_em1="inet 192.168.80.2 netmask 255.255.255.0"
ifconfig_em2="inet 192.168.120.2 netmask 255.255.255.0"
ifconfig_em3="DHCP"
sshd_enable="YES"
gateway_enable="YES"
defaultrouter="192.168.40.57"
# Set dumpdev to "AUTO" to enable crash dumps, "NO" to disable
dumpdev="AUTO"
```

Создание DHCP-серверов (FreeBSD)

- Редактирование конфигурационного файла и запуск

```
# Sample configuration file for ISC dhcpd
# option definitions common to all supported networks...
option domain-name "example.org";
option domain-name-servers ns1.example.org, ns2.example.org;

default-lease-time 600;
max-lease-time 3600;

subnet 192.168.80.0 netmask 255.255.255.0{
interface em2;
range 192.168.80.127 192.168.80.224;
option domain-name-servers 192.168.32.2;
option domain-name "example.com";
option routers 192.168.80.2;
option broadcast-address 192.168.80.255;
}
# Use this to enble / disable dynamic dns updates globally.
#ddns-update-style none;

# If this DHCP server is the official DHCP server for the local
# network, the authoritative directive should be uncommented.
#authoritative;

/usr/local/etc/dhcpd.conf: 109 lines, 3503 characters.
root@:~ # vi /usr/local/etc/dhcpd.conf
```

```
Edit /etc/motd to change this login announcement.
root@:~ # /usr/local/etc/rc.d/isc-dhcpd restart
Stopping dhcpd.
Starting dhcpd.
```

Создание DHCP-сервера (Ubuntu)

- Установка сервера

```
user@user-virtual-machine:~$ sudo apt-get install isc-dhcp-server
[sudo] password for user:
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
  libirs-export141 libisccfg-export140
Suggested packages:
  isc-dhcp-server-ldap policycoreutils
The following NEW packages will be installed:
  isc-dhcp-server libirs-export141 libisccfg-export140
0 upgraded, 3 newly installed, 0 to remove and 179 not upgraded.
Need to get 470 kB of archives.
After this operation, 1,587 kB of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://us.archive.ubuntu.com/ubuntu xenial-updates/main amd64 libisccfg-export140 amd64 1:9.10.3.dfsg.P4-8ubuntu1.19 [38.6 kB]
Get:2 http://us.archive.ubuntu.com/ubuntu xenial-updates/main amd64 libirs-export141 amd64 1:9.10.3.dfsg.P4-8ubuntu1.19 [17.5 kB]
Get:3 http://us.archive.ubuntu.com/ubuntu xenial-updates/main amd64 isc-dhcp-server amd64 4.3.3-5ubuntu12.10 [414 kB]
Fetched 470 kB in 1s (326 kB/s)
Preconfiguring packages ...
Selecting previously unselected package libisccfg-export140.
(Reading database ... 177106 files and directories currently installed.)
Preparing to unpack .../libisccfg-export140_1%3a9.10.3.dfsg.P4-8ubuntu1.19_amd64.deb ...
Unpacking libisccfg-export140 (1:9.10.3.dfsg.P4-8ubuntu1.19) ...
Selecting previously unselected package libirs-export141.
Preparing to unpack .../libirs-export141_1%3a9.10.3.dfsg.P4-8ubuntu1.19_amd64.deb ...
Unpacking libirs-export141 (1:9.10.3.dfsg.P4-8ubuntu1.19) ...
Selecting previously unselected package isc-dhcp-server.
Preparing to unpack .../isc-dhcp-server_4.3.3-5ubuntu12.10_amd64.deb ...
Unpacking isc-dhcp-server (4.3.3-5ubuntu12.10) ...
Processing triggers for libc-bin (2.23-0ubuntu11.2) ...
Processing triggers for ureadahead (0.100.0-19.1) ...
Processing triggers for systemd (229-4ubuntu21.28) ...
Processing triggers for man-db (2.7.5-1) ...
Setting up libisccfg-export140 (1:9.10.3.dfsg.P4-8ubuntu1.19) ...
Setting up libirs-export141 (1:9.10.3.dfsg.P4-8ubuntu1.19) ...
Setting up isc-dhcp-server (4.3.3-5ubuntu12.10) ...
Generating /etc/default/isc-dhcp-server...
Processing triggers for libc-bin (2.23-0ubuntu11.2) ...
Processing triggers for ureadahead (0.100.0-19.1) ...
Processing triggers for systemd (229-4ubuntu21.28) ...
user@user-virtual-machine:~$
```

Редактирование конфигурационного файла

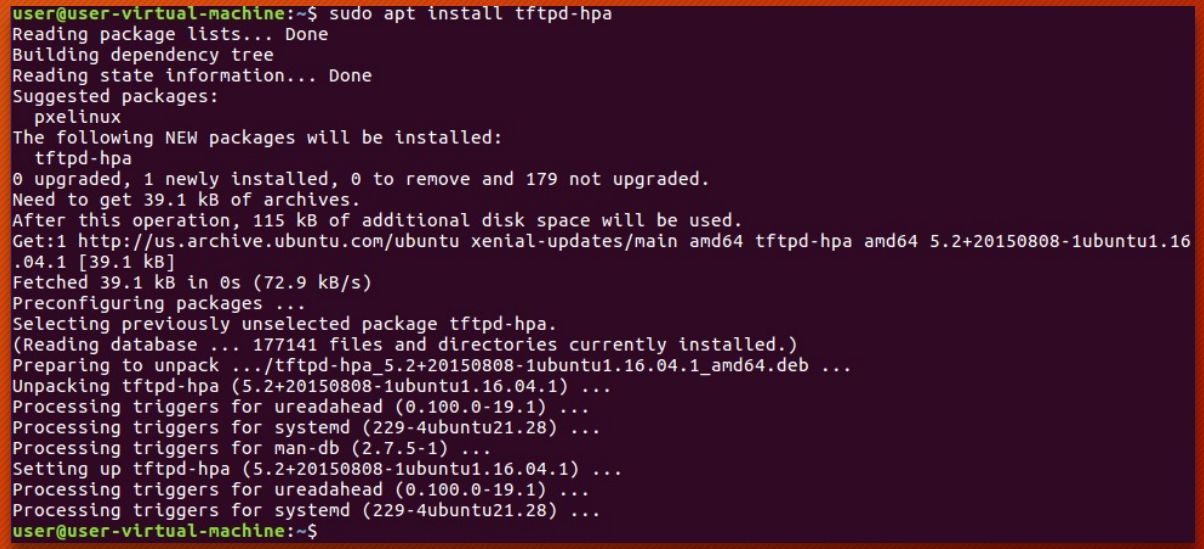
- Запуск

```
user@user-virtual-machine:~$ sudo vi /etc/dhcp/dhcpd.conf
user@user-virtual-machine:~$ cat /etc/dhcp/dhcpd.conf
#
# Sample configuration file for ISC dhcpd for Debian
#
# Attention: If /etc/ltsp/dhcpd.conf exists, that will be used as
# configuration file instead of this file.
#
#

# The ddns-updates-style parameter controls whether or not the server will
# attempt to do a DNS update when a lease is confirmed. We default to the
# behavior of the version 2 packages ('none', since DHCP v2 didn't
# have support for DDNS.)
ddns-update-style none;

# option definitions common to all supported networks...
option domain-name "example.org";
option domain-name-servers ns1.example.org, ns2.example.org;

default-lease-time 600;
max-lease-time 7200;

subnet 192.168.120.0 netmask 255.255.255.0{
range 192.168.120.100 192.168.120.200;
option domain-name-servers 192.168.32.2;
option domain-name "example.com";
option routers 192.168.120.2;
option broadcast-addres 192.168.120.255;
}

# If this DHCP server is the official DHCP server for the local
# network, the authoritative directive should be uncommented.
#authoritative;

# Use this to send dhcp log messages to a different log file (you also
# have to hack syslog.conf to complete the redirection).
```

```
user@user-virtual-machine:~$ sudo systemctl start isc-dhcp-server
user@user-virtual-machine:~$ sudo systemctl enable isc-dhcp-server
Synchronizing state of isc-dhcp-server.service with SysV init with /lib/systemd/systemd-sysv-install...
Executing /lib/systemd/systemd-sysv-install enable isc-dhcp-server
user@user-virtual-machine:~$
```

Создание TFTP-сервера на Ubuntu

- Загрузка сервера



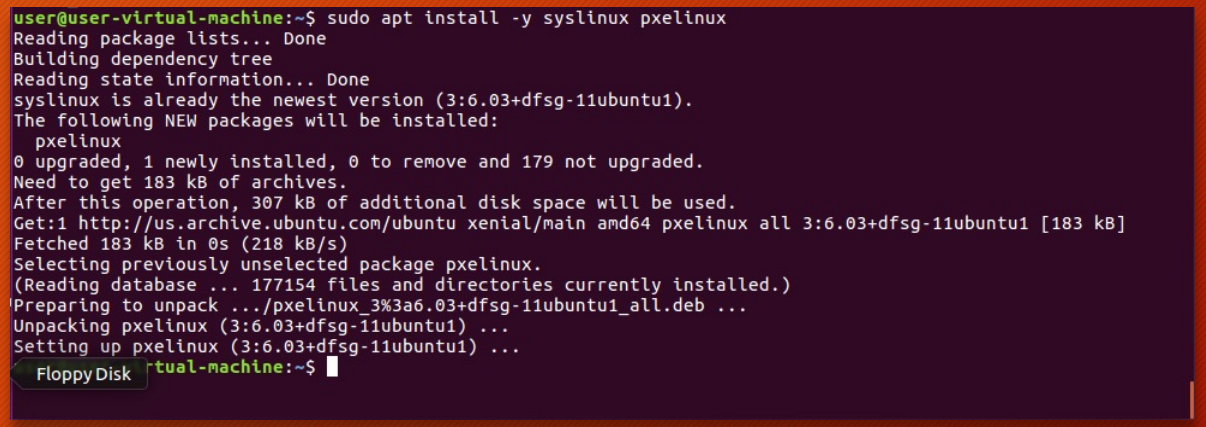
Создание TFTP-сервера на Ubuntu

- конфигурационный файл /etc/rc.conf

```
user@user-virtual-machine:~$ sudo vi /etc/rc.conf
user@user-virtual-machine:~$ cat /etc/rc.conf
tftpd_enable="YES"
tftpd_flags="-p -s /usr/tftpboot -B 1024 -ipv4"
user@user-virtual-machine:~$
```

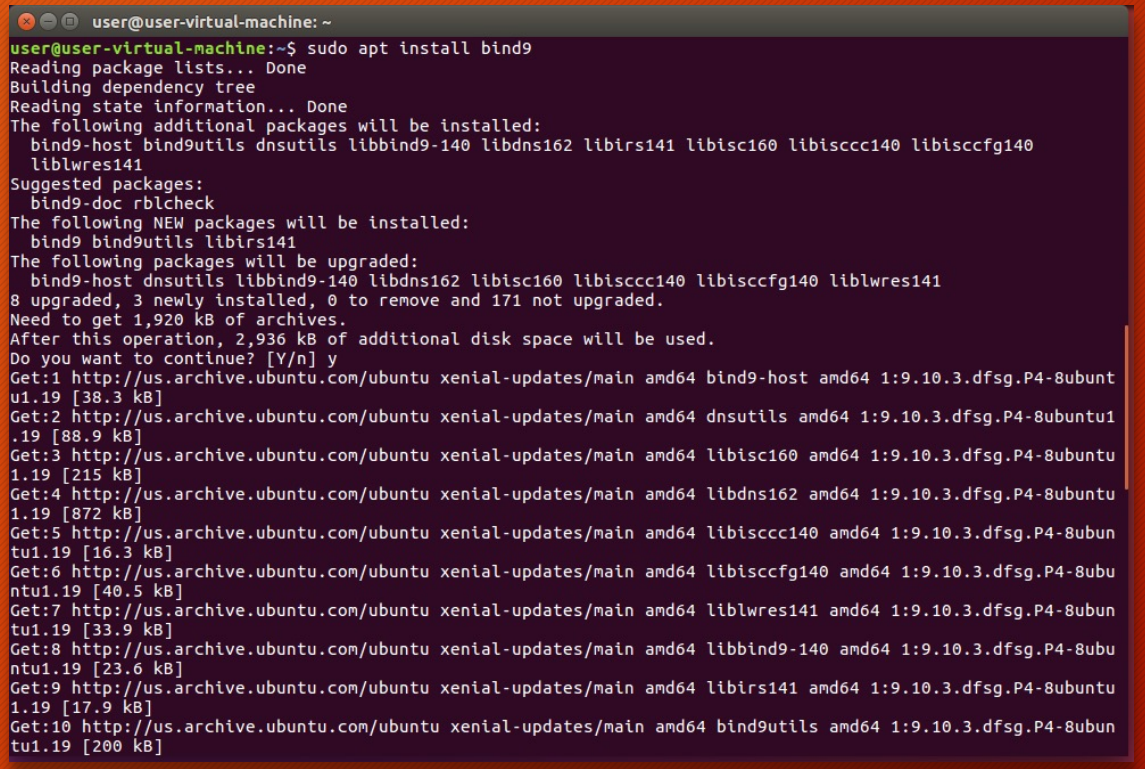
Создание TFTP-сервера на Ubuntu

- Установка SysLinux



Создание DNS-сервера

- Загрузка bind9



Создание DNS-сервера

- Изменение конфигурационного файла

```
user@user-virtual-machine:~$ sudo vi /etc/bind/named.conf.options
user@user-virtual-machine:~$ cat /etc/bind/named.conf.options
options {
        directory "/var/cache/bind";

        // If there is a firewall between you and nameservers you want
        // to talk to, you may need to fix the firewall to allow multiple
        // ports to talk.  See http://www.kb.cert.org/vuls/id/800113

        // If your ISP provided one or more IP addresses for stable
        // nameservers, you probably want to use them as forwarders.
        // Uncomment the following block, and insert the addresses replacing
        // the all-0's placeholder.

         forwarders {
                8.8.8.8;
         };

        //========================================================================
        // If BIND logs error messages about the root key being expired,
        // you will need to update your keys.  See https://www.isc.org/bind-keys
        //========================================================================
        dnssec-validation auto;

        auth-nxdomain no;    # conform to RFC1035
        listen-on-v6 { any; };
};

user@user-virtual-machine:~$
```

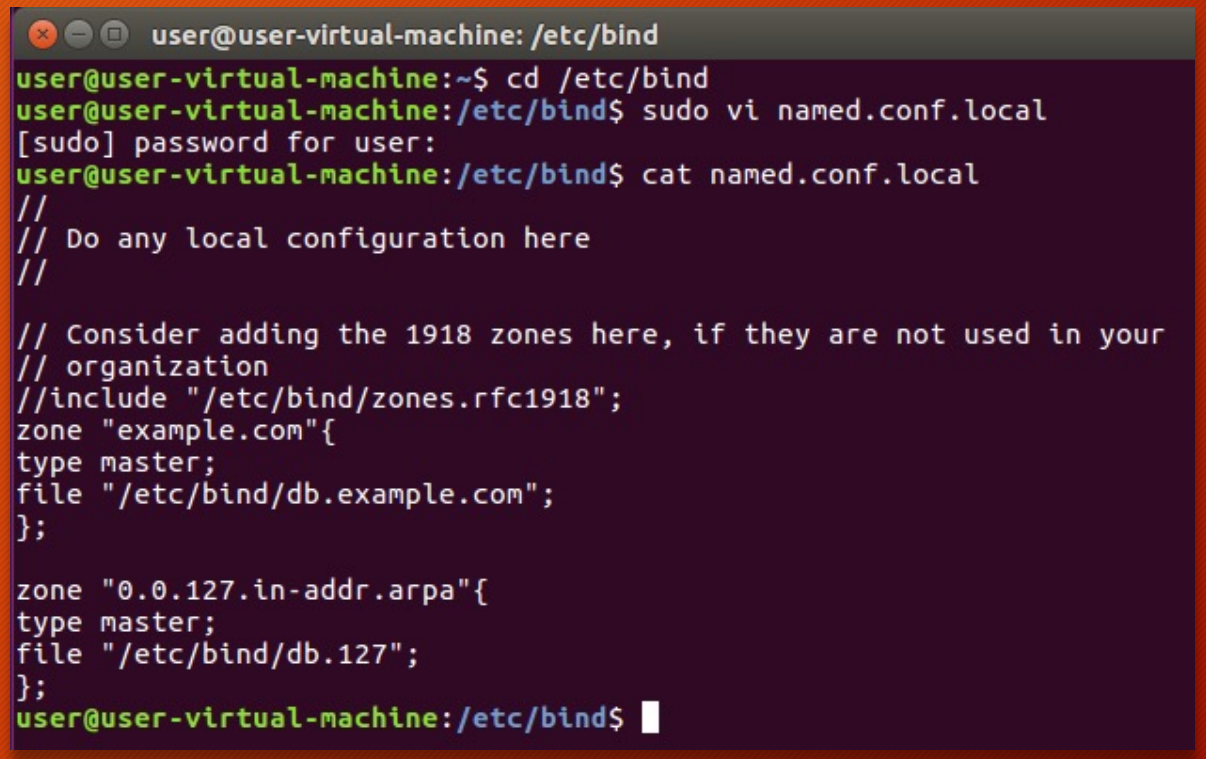
Создание DNS-сервера

- Результат запроса

```
user@user-virtual-machine:~$ nslookup mail.ru
Server:         127.0.1.1
Address:        127.0.1.1#53

Non-authoritative answer:
Name:   mail.ru
Address: 217.69.139.200
Name:   mail.ru
Address: 217.69.139.202
Name:   mail.ru
Address: 94.100.180.200
Name:   mail.ru
Address: 94.100.180.201

user@user-virtual-machine:~$
```

Создание DNS-сервера

- Добавление зон



Создание DNS-сервера

- Просмотр файла зоны

```
user@user-virtual-machine:/etc/bind$ cat db.127
;
; BIND reverse data file for local loopback interface
;
$TTL    604800
@       IN      SOA     localhost. root.localhost. (
                              1         ; Serial
                         604800         ; Refresh
                          86400         ; Retry
                        2419200         ; Expire
                         604800 )       ; Negative Cache TTL
;
@       IN      NS      localhost.
1.0.0   IN      PTR     localhost.
user@user-virtual-machine:/etc/bind$
```

Создание DNS-сервера

- Редактирование файла зоны

```
;
; BIND reverse data file for local loopback interface
;
$TTL    604800
@       IN      SOA     localhost. root.localhost. (
                              1         ; Serial
                         604800         ; Refresh
                          86400         ; Retry
                        2419200         ; Expire
                         604800 )       ; Negative Cache TTL
;
@       IN      NS      localhost.
@       IN      A       127.0.0.1
@       IN      AAAA    ::1
```

Выводы

В ходе лабораторной работы были созданы:

- DHCP-серверы в системах Ubuntu и FreeBSD;
- TFTP-сервер в системе Ubuntu;
- DNS-сервер в системе Ubuntu.