САНКТ-ПЕТЕРБУРГСКИЙ ПОЛИТЕХНИЧЕСКИЙ УНИВЕРСИТЕТ
ПЕТРА ВЕЛИКОГО

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Дисциплина «Администрирование компьютерных сетей»

ОТЧЁТ

по лабораторной работе № 3
на тему
«Администрирование сетевых сервисов»

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Санкт-Петербург
2021

Оглавление

Цели работы

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

Ход работы

В ходе 1 лабораторной работы была создана сеть виртуальных машин в системе VMware Workstation Pro, которая имеет следующие параметры:

Основные системы ОС в системе:

- NetBSD
- FreeBSD
- Linux Ubuntu
- Windows 7
- Windows XP

Схема ККС:

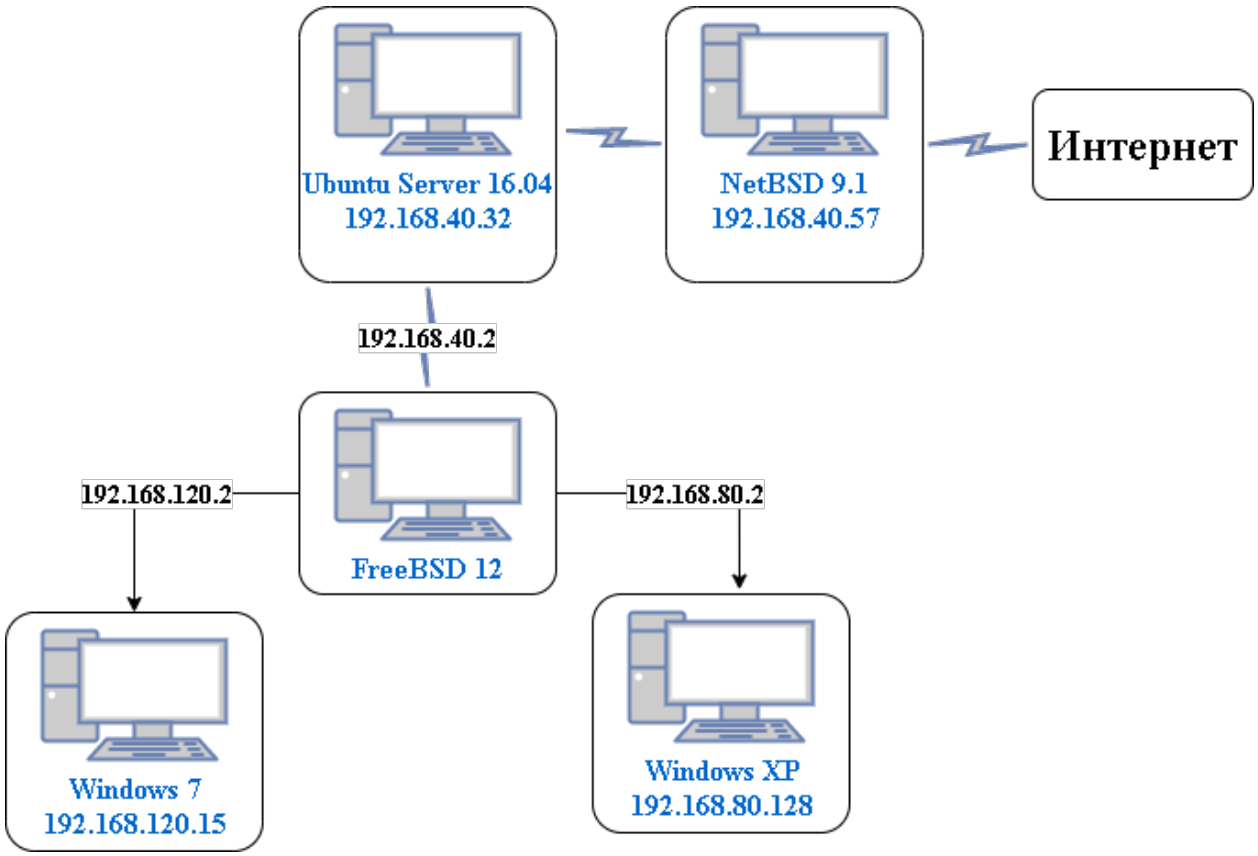

Рисунок 1 - схема ККС

Создание DHCP-серверов

FreeBSD

Был создан и запущен DHCP-сервер в системе FreeBSD

Рисунок 2 - установка сервера

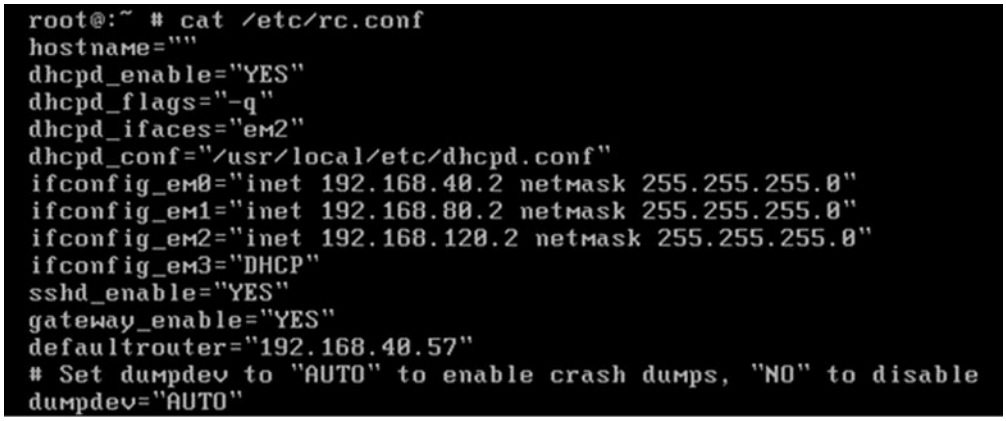

Рисунок 3 - редактирование файла /etc/rc.conf

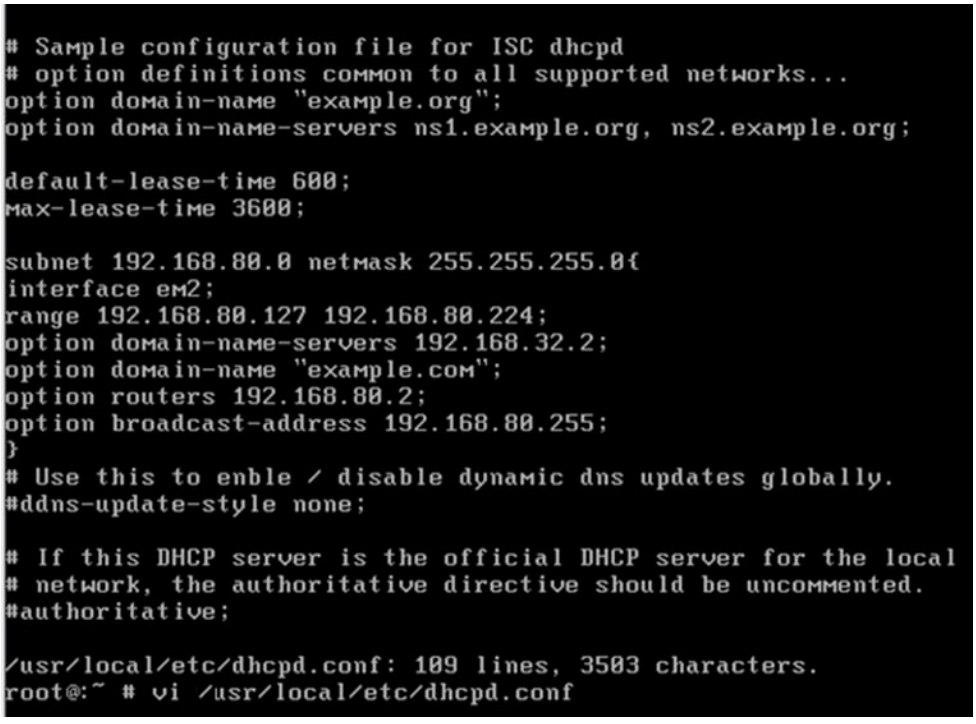

Рисунок 4 - результат редактирования конфигурационного файла DHCP

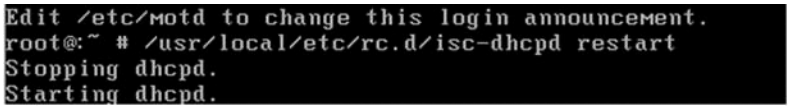

Рисунок 5 – запуск

Создание DHCP-сервера Linux Ubuntu

Был создан схожий с сервером в системе FreeBSD на Linux Ubuntu

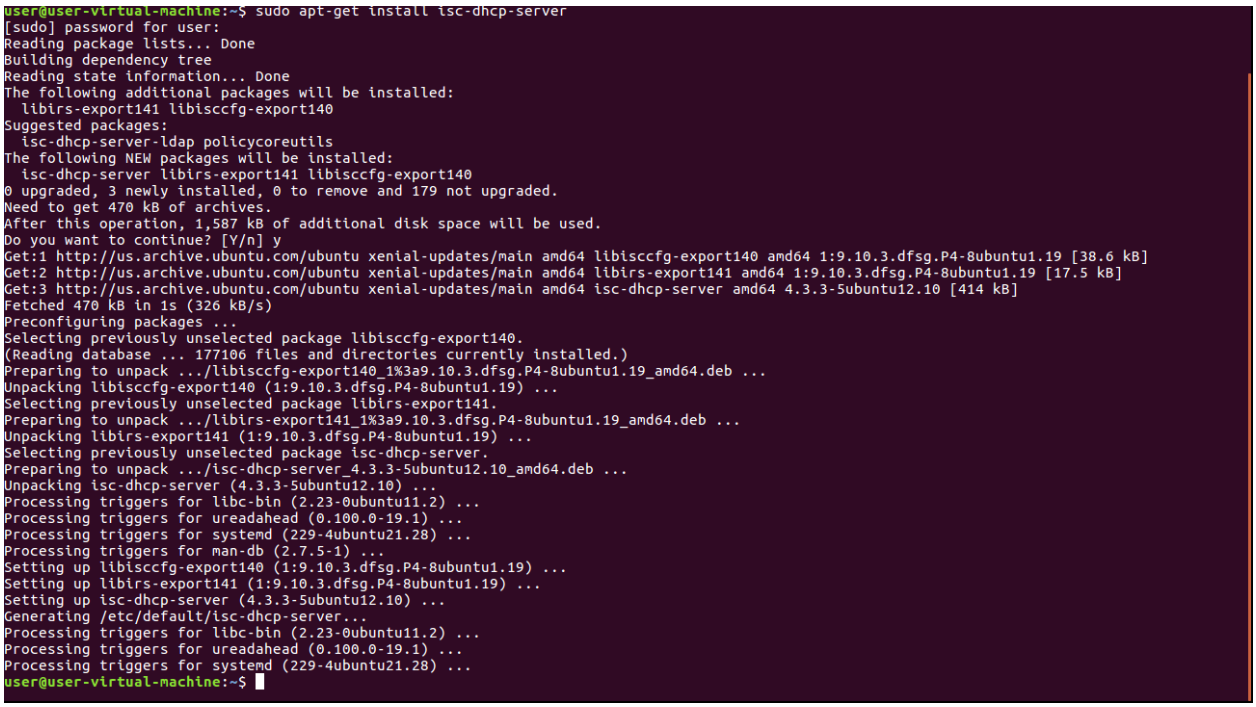

Рисунок 6 - установка сервера

```
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).
```

Рисунок 7 - редактирование конф. файла /etc/rc.conf

```
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:~$
```

Рисунок 8 - запуск

Создание TFTP-сервера на Ubuntu

```
user@user-virtual-machine:~$ sudo apt install tftpd-hpa
Reading package lists... Done
Building dependency tree
Reading state information... Done
Suggested packages:
  pxelinux
The following NEW packages will be installed:
  tftpd-hpa
0 upgraded, 1 newly installed, 0 to remove and 179 not upgraded.
Need to get 39.1 kB of archives.
After this operation, 115 kB of additional disk space will be used.
Get:1 http://us.archive.ubuntu.com/ubuntu xenial-updates/main amd64 tftpd-hpa amd64 5.2+20150808-1ubuntu1.16
.04.1 [39.1 kB]
Fetched 39.1 kB in 0s (72.9 kB/s)
Preconfiguring packages ...
Selecting previously unselected package tftpd-hpa.
(Reading database ... 177141 files and directories currently installed.)
Preparing to unpack .../tftpd-hpa_5.2+20150808-1ubuntu1.16.04.1_amd64.deb ...
Unpacking tftpd-hpa (5.2+20150808-1ubuntu1.16.04.1) ...
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 tftpd-hpa (5.2+20150808-1ubuntu1.16.04.1) ...
Processing triggers for ureadahead (0.100.0-19.1) ...
Processing triggers for systemd (229-4ubuntu21.28) ...
user@user-virtual-machine:~$
```

Рисунок 9 – загрузка tftpd сервера

```
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:~$
```

Рисунок 10 – конфигурационный файл /etc/rc.conf

```
user@user-virtual-machine:~$ sudo apt install -y syslinux pxelinux
Reading package lists... Done
Building dependency tree
Reading state information... Done
syslinux is already the newest version (3:6.03+dfsg-11ubuntu1).
The following NEW packages will be installed:
  pxelinux
0 upgraded, 1 newly installed, 0 to remove and 179 not upgraded.
Need to get 183 kB of archives.
After this operation, 307 kB of additional disk space will be used.
Get:1 http://us.archive.ubuntu.com/ubuntu xenial/main amd64 pxelinux all 3:6.03+dfsg-11ubuntu1 [183 kB]
Fetched 183 kB in 0s (218 kB/s)
Selecting previously unselected package pxelinux.
(Reading database ... 177154 files and directories currently installed.)
Preparing to unpack .../pxelinux_3%3a6.03+dfsg-11ubuntu1_all.deb ...
Unpacking pxelinux (3:6.03+dfsg-11ubuntu1) ...
Setting up pxelinux (3:6.03+dfsg-11ubuntu1) ...
Floppy Disk
```

Рисунок 11 - установка sysLinux

Создание DNS-сервера
Создали, настроили и проверили DNS-сервер

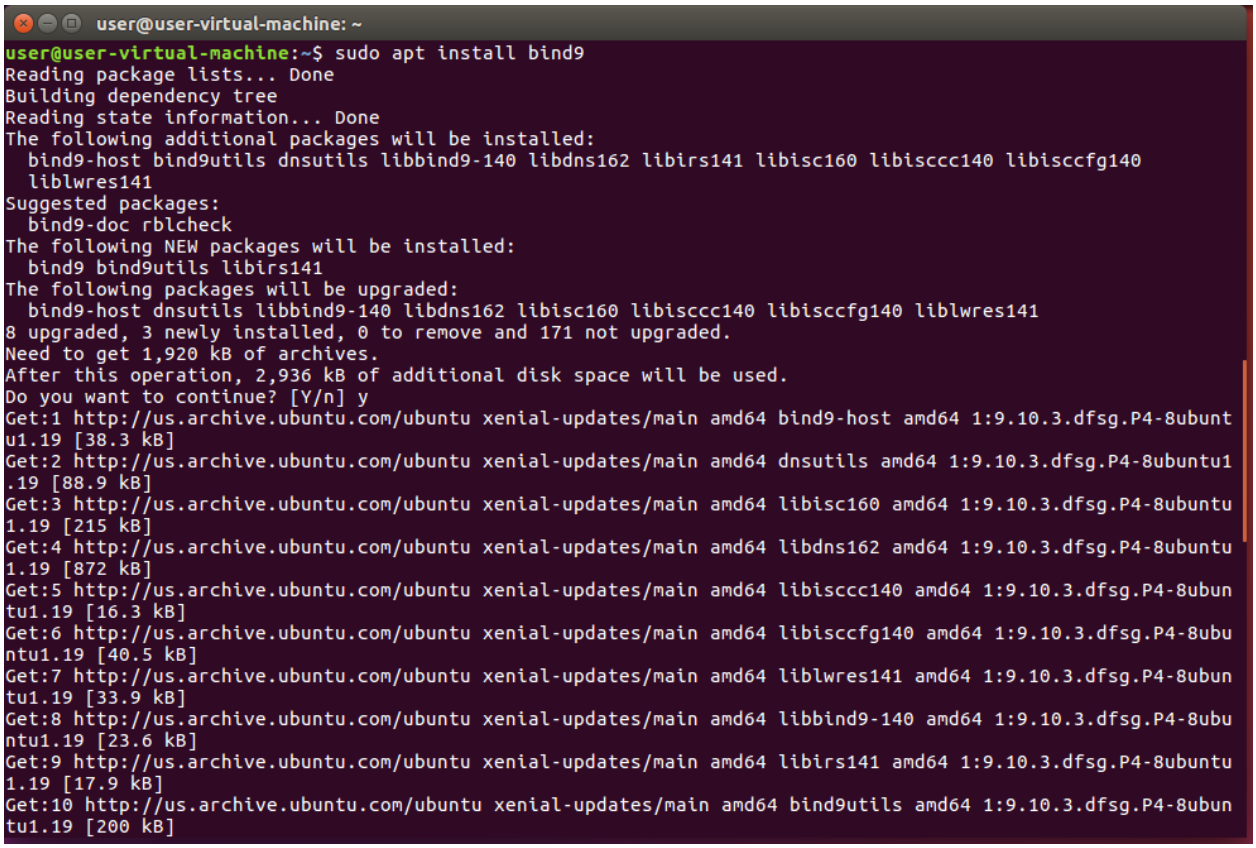

Рисунок 12 - загрузка bind9

```
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:~$
```

Рисунок 13 - изменение конфигурационный файл

```
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:~$
```

Рисунок 14 - результат запроса

```
user@user-virtual-machine: /etc/bind
user@user-virtual-machine:~$ cd /etc/bind
user@user-virtual-machine:/etc/bind$ sudo vi named.conf.local
[sudo] password for user:
user@user-virtual-machine:/etc/bind$ cat named.conf.local
//
// Do any local configuration here
//

// Consider adding the 1918 zones here, if they are not used in your
// organization
//include "/etc/bind/zones.rfc1918";
zone "example.com"{
type master;
file "/etc/bind/db.example.com";
};

zone "0.0.127.in-addr.arpa"{
type master;
file "/etc/bind/db.127";
};
user@user-virtual-machine:/etc/bind$
```

Рисунок 15 - добавление зон

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

Рисунок 16 - просмотр 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
```

Рисунок 17 - редактирование файла зоны

Вывод

В ходе лабораторной работы были созданы:

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