

Лабораторная работа №4

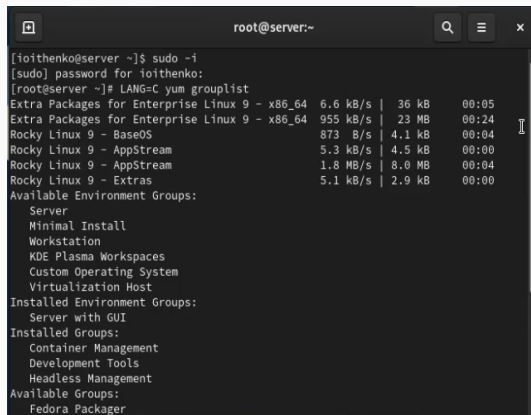
Администрирование сетевых подсистем

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Приобретение практических навыков по установке и базовому конфигурированию HTTP-сервера Apache.

Выполнение лабораторной работы

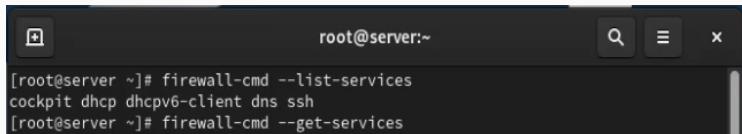


```
root@server:~  
[ioithenko@server ~]$ sudo -i  
[sudo] password for ioithenko:  
[root@server ~]# LANG=C yum grouplist  
Extra Packages for Enterprise Linux 9 - x86_64 6.6 kB/s | 36 kB 00:05  
Extra Packages for Enterprise Linux 9 - x86_64 955 kB/s | 23 MB 00:24  
Rocky Linux 9 - BaseOS 873 B/s | 4.1 kB 00:04  
Rocky Linux 9 - AppStream 5.3 kB/s | 4.5 kB 00:00  
Rocky Linux 9 - AppStream 1.8 MB/s | 8.0 MB 00:04  
Rocky Linux 9 - Extras 5.1 kB/s | 2.9 kB 00:00  
Available Environment Groups:  
  Server  
  Minimal Install  
  Workstation  
  KDE Plasma Workspaces  
  Custom Operating System  
  Virtualization Host  
Installed Environment Groups:  
  Server with GUI  
Installed Groups:  
  Container Management  
  Development Tools  
  Headless Management  
Available Groups:  
  Fedora Packager
```

Рис. 1: Установка веб-сервера

```
[root@server ~]# dnf -y groupinstall "Basic Web Server"
Last metadata expiration check: 0:00:57 ago on Wed 25 Sep 2024 11:35:58 AM UTC.
Dependencies resolved.
=====
Package                Arch      Version                Repository             Size
=====
Installing group/module packages:
httpd                  x86_64    2.4.57-11.el9_4.1     appstream              44 k
httpd-manual           noarch    2.4.57-11.el9_4.1     appstream              2.2 M
mod_fcgid              x86_64    2.3.9-28.el9          appstream              74 k
mod_ssl                x86_64    1:2.4.57-11.el9_4.1   appstream              108 k
Installing dependencies:
apr                    x86_64    1.7.0-12.el9_3        appstream              122 k
apr-util              x86_64    1.6.1-23.el9          appstream              94 k
apr-util-bdb          x86_64    1.6.1-23.el9          appstream              12 k
httpd-core             x86_64    2.4.57-11.el9_4.1     appstream              1.4 M
httpd-filesystem       noarch    2.4.57-11.el9_4.1     appstream              11 k
```

Рис. 2: Установка веб-сервера

A terminal window with a dark background. The title bar shows a window icon, the text 'root@server:~', and search, menu, and close buttons. The terminal content shows two commands and their output.

```
[root@server ~]# firewall-cmd --list-services
cockpit dhcp dhcpv6-client dns ssh
[root@server ~]# firewall-cmd --get-services
```

Рис. 3: Внесение изменений в настройки межсетевого экрана

```
[root@server ~]# firewall-cmd --add-service=http
success
[root@server ~]# firewall-cmd --add-service=http -permanent
usage: 'firewall-cmd --help' for usage information or see firewall-cmd(1) man page
firewall-cmd: error: unrecognized arguments: -permanent
[root@server ~]# firewall-cmd --add-service=http --permanent
success
[root@server ~]# systemctl enable httpd
Created symlink /etc/systemd/system/multi-user.target.wants/httpd.service → /usr/lib/systemd/system/httpd.service.
[root@server ~]# systemctl start httpd
```

Рис. 4: Внесение изменений в настройки межсетевого экрана, запуск HTTP-сервера

```
Sep 25 11:49:32 server systemd[1]: Starting The Apache HTTP Server...
  Subject: A start job for unit httpd.service has begun execution
  Defined-By: systemd
  Support: https://wiki.rockylinux.org/rocky/support

  A start job for unit httpd.service has begun execution.

  The job identifier is 2966.
Sep 25 11:49:32 server httpd[6651]: AH00558: httpd: Could not reliably determine
the server's fully qualified domain name, using 127.0.1.1. Set the 'ServerName'
directive globally to suppress this message
Sep 25 11:49:32 server systemd[1]: Started The Apache HTTP Server.
  Subject: A start job for unit httpd.service has finished successfully
  Defined-By: systemd
  Support: https://wiki.rockylinux.org/rocky/support

  A start job for unit httpd.service has finished successfully.

  The job identifier is 2966.
Sep 25 11:49:32 server httpd[6651]: Server configured, listening on: port 443, p
ort 80
```

Рис. 5: Расширенный лог системных сообщений

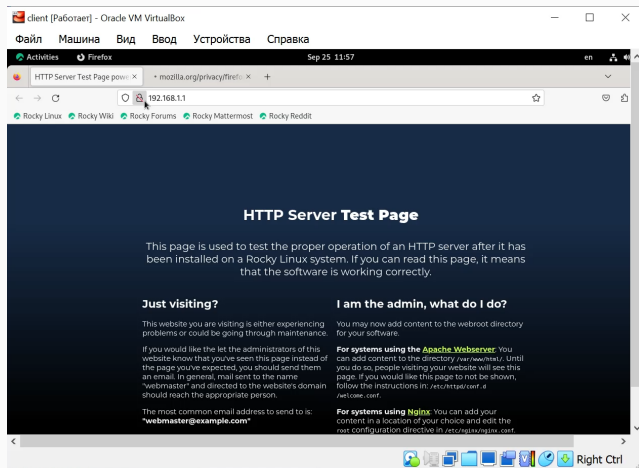


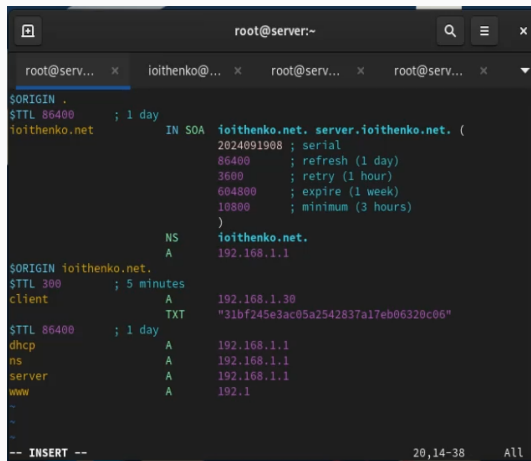
Рис. 6: Тестовая страницы HTTP-сервера

```
[root@server ~]# tail -f /var/log/httpd/error_log
[Wed Sep 25 11:49:32.661878 2024] [core:notice] [pid 6651:tid 6651] SELinux policy enabled; httpd running as context system_u:system_r:httpd_t:s0
[Wed Sep 25 11:49:32.675102 2024] [suexec:notice] [pid 6651:tid 6651] AH01232: suEXEC mechanism enabled (wrapper: /usr/sbin/suexec)
AH00558: httpd: Could not reliably determine the server's fully qualified domain name, using 127.0.1.1. Set the 'ServerName' directive globally to suppress this message
[Wed Sep 25 11:49:32.756154 2024] [lbmethod_heartbeat:notice] [pid 6651:tid 6651] AH02282: No slotmem from mod_heartbeat
[Wed Sep 25 11:49:32.807594 2024] [mpm_event:notice] [pid 6651:tid 6651] AH00489: Apache/2.4.57 (Rocky Linux) OpenSSL/3.0.7 mod_fcgid/2.3.9 configured -- resuming normal operations
[Wed Sep 25 11:49:32.810432 2024] [core:notice] [pid 6651:tid 6651] AH00094: Command line: '/usr/sbin/httpd -D FOREGROUND'
[Wed Sep 25 11:57:50.173418 2024] [autoindex:error] [pid 6656:tid 6778] [client 192.168.1.30:37102] AH01276: Cannot serve directory /var/www/html/: No matching DirectoryIndex (index.html) found, and server-generated directory index forbidden by Options directive
```

Рис. 7: Запись в логе ошибок

```
[root@server ~]# tail -f /var/log/httpd/access_log
192.168.1.30 - - [25/Sep/2024:11:57:50 +0000] "GET / HTTP/1.1" 403 7620 "-" "Mozilla/5.0 (X11; Linux x86_64; rv:109.0) Gecko/20100101 Firefox/115.0"
192.168.1.30 - - [25/Sep/2024:11:57:54 +0000] "GET /icons/poweredby.png HTTP/1.1" 200 15443 "http://192.168.1.1/" "Mozilla/5.0 (X11; Linux x86_64; rv:109.0) Gecko/20100101 Firefox/115.0"
192.168.1.30 - - [25/Sep/2024:11:57:54 +0000] "GET /poweredby.png HTTP/1.1" 200 5714 "http://192.168.1.1/" "Mozilla/5.0 (X11; Linux x86_64; rv:109.0) Gecko/20100101 Firefox/115.0"
192.168.1.30 - - [25/Sep/2024:11:57:54 +0000] "GET /favicon.ico HTTP/1.1" 404 196 "http://192.168.1.1/" "Mozilla/5.0 (X11; Linux x86_64; rv:109.0) Gecko/20100101 Firefox/115.0"
```

Рис. 8: Запись в мониторинге доступа

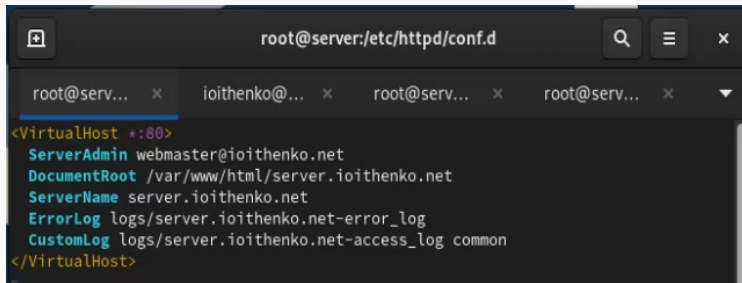


```
root@server:~  
root@serv... x ioithenko@... x root@serv... x root@serv... x  
$ORIGIN .  
$TTL 86400 ; 1 day  
ioithenko.net IN SOA ioithenko.net. server.ioithenko.net. (  
2024091908 ; serial  
86400 ; refresh (1 day)  
3600 ; retry (1 hour)  
604800 ; expire (1 week)  
10800 ; minimum (3 hours)  
)  
NS ioithenko.net.  
A 192.168.1.1  
$ORIGIN ioithenko.net.  
$TTL 300 ; 5 minutes  
client A 192.168.1.30  
TXT "31bf245e3ac05a2542837a17eb06320c06"  
$TTL 86400 ; 1 day  
dhcp A 192.168.1.1  
ns A 192.168.1.1  
server A 192.168.1.1  
www A 192.1  
~  
~  
~  
-- INSERT -- 20,14-38 All
```

Рис. 9: Добавление записи в конец файла прямой DNS-зоны


```
[root@server ~]# systemctl stop named
[root@server ~]# vim /var/named/master/fz/ioithenko.net
[root@server ~]# vim /var/named/master/rz/192.168.1
[root@server ~]# rm /var/named/master/fz/ioithenko.net.jnl
rm: remove regular file '/var/named/master/fz/ioithenko.net.jnl'? y
[root@server ~]# rm /var/named/master/rz/192.168.1.jnl
rm: remove regular file '/var/named/master/rz/192.168.1.jnl'? y
[root@server ~]# systemctl start named
[root@server ~]# cd /etc/httpd/conf.d
[root@server conf.d]# touch server.ioithenko.net.conf
```

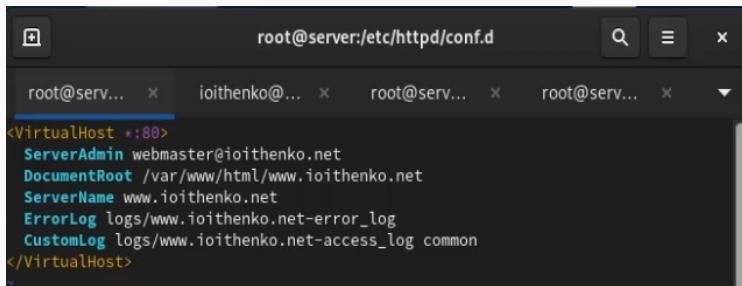
Рис. 11: Удаление файлов журналов DNS, создание файлов



```
root@server:/etc/httpd/conf.d

root@serv... x ioithenko@... x root@serv... x root@serv... x
<VirtualHost *:80>
  ServerAdmin webmaster@ioithenko.net
  DocumentRoot /var/www/html/server.ioithenko.net
  ServerName server.ioithenko.net
  ErrorLog logs/server.ioithenko.net-error_log
  CustomLog logs/server.ioithenko.net-access_log common
</VirtualHost>
```

Рис. 12: Редактирование server.ioithenko.net.conf

A screenshot of a terminal window with a dark background. The title bar at the top shows 'root@server:/etc/httpd/conf.d' and includes search, menu, and close icons. Below the title bar, there are four tabs: 'root@serv...', 'ioithenko@...', 'root@serv...', and 'root@serv...'. The main area of the terminal displays the configuration for a VirtualHost. The text is as follows:

```
<VirtualHost *:80>  
    ServerAdmin webmaster@ioithenko.net  
    DocumentRoot /var/www/html/www.ioithenko.net  
    ServerName www.ioithenko.net  
    ErrorLog logs/www.ioithenko.net-error_log  
    CustomLog logs/www.ioithenko.net-access_log common  
</VirtualHost>
```

Рис. 13: Редактирование `www.ioithenko.net.conf`


```
[root@server conf.d]# cd /var/www/html  
[root@server html]# mkdir server.ioithenko.net
```

Рис. 14: Создание каталога и файла главной страницы

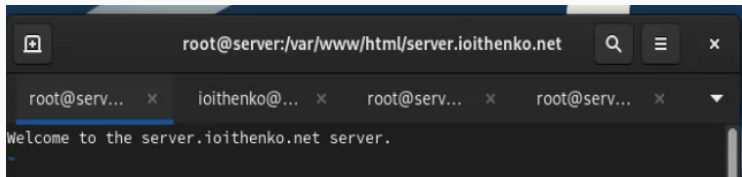


Рис. 15: Заполнение файла

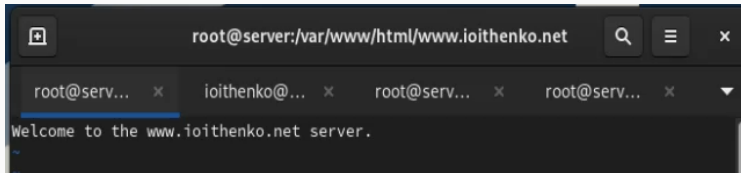


Рис. 16: Заполнение файла

```
[root@server www.ioithenko.net]# chown -R apache:apache /var/www  
[root@server www.ioithenko.net]# restorecon -vR /etc  
[root@server www.ioithenko.net]# restorecon -vR /var/named  
[root@server www.ioithenko.net]# restorecon -vR /var/www  
[root@server www.ioithenko.net]# systemctl restart httpd
```

Рис. 17: Корректирование прав доступа, восстановление контекста безопасности

```
[root@server html]# systemctl restart httpd  
[root@server html]#
```

Рис. 18: Перезагрузка httpd

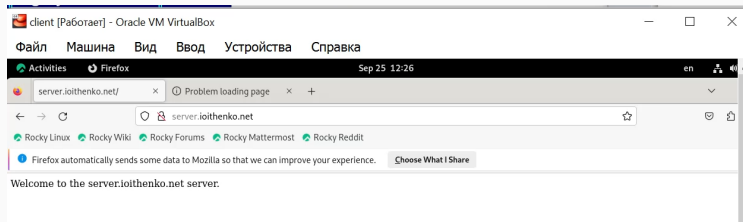


Рис. 19: Доступ к `server.ioithenko.net`

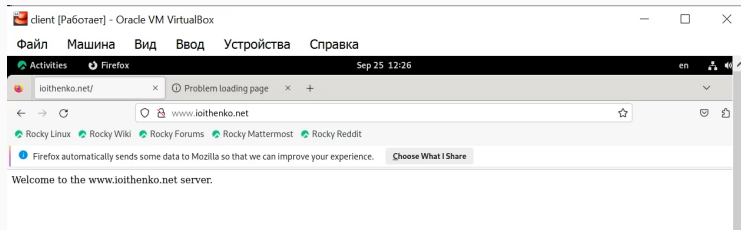
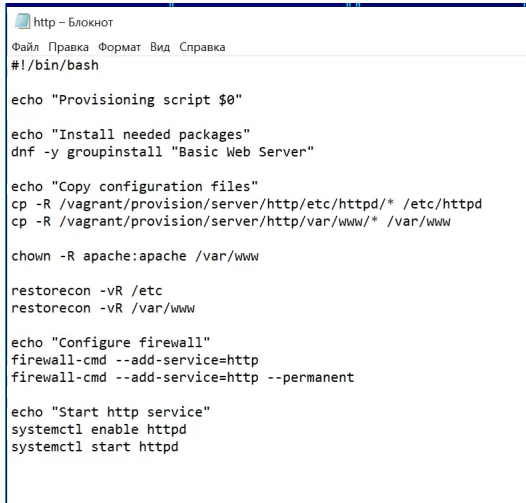


Рис. 20: Доступ к www.ioithenko.net

```
[root@server html]# cd /vagrant/provision/server
[root@server server]# mkdir /vagrant/provision/server/http/etc/httpd/conf.d
mkdir: cannot create directory '/vagrant/provision/server/http/etc/httpd/conf.d'
: No such file or directory
[root@server server]# mkdir -p /vagrant/provision/server/http/etc/httpd/conf.d
[root@server server]# cp -R /etc/httpd/conf.d/* /vagrant/provision/server/http/e
tc/httpd/conf.d/
[root@server server]# mkdir -p /vagrant/provision/server/http/var/www/html
[root@server server]# cp -R /var/www/html/* /vagrant/provision/server/http/var/w
ww/html
[root@server server]# cd /server/dns
-bash: cd: /server/dns: No such file or directory
[root@server server]# cd /dns
-bash: cd: /dns: No such file or directory
[root@server server]# cd /vagrant/provision/server/dns/
[root@server dns]# cp /var/named/* /vagrant/provision/server/dns/var/named/
```

Рис. 21: Изменения в настройки внутреннего окружения



```
http - Блокнот
Файл Правка Формат Вид Справка
#!/bin/bash

echo "Provisioning script $0"

echo "Install needed packages"
dnf -y groupinstall "Basic Web Server"

echo "Copy configuration files"
cp -R /vagrant/provision/server/http/etc/httpd/* /etc/httpd
cp -R /vagrant/provision/server/http/var/www/* /var/www

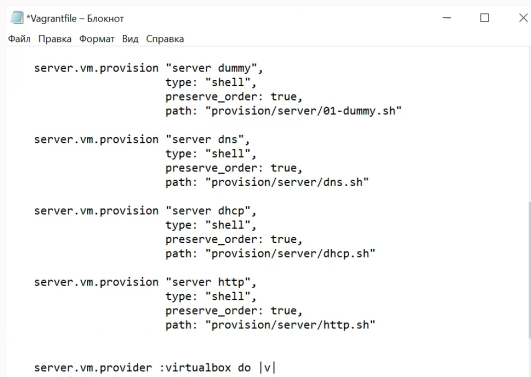
chown -R apache:apache /var/www

restorecon -vR /etc
restorecon -vR /var/www

echo "Configure firewall"
firewall-cmd --add-service=http
firewall-cmd --add-service=http --permanent

echo "Start http service"
systemctl enable httpd
systemctl start httpd
```

Рис. 22: Создание скрипта `http.sh`



```
server.vm.provision "server dummy",
  type: "shell",
  preserve_order: true,
  path: "provision/server/01-dummy.sh"

server.vm.provision "server dns",
  type: "shell",
  preserve_order: true,
  path: "provision/server/dns.sh"

server.vm.provision "server dhcp",
  type: "shell",
  preserve_order: true,
  path: "provision/server/dhcp.sh"

server.vm.provision "server http",
  type: "shell",
  preserve_order: true,
  path: "provision/server/http.sh"

server.vm.provider :virtualbox do |v|
```

Рис. 23: Изменение Vagrantfile

Выводы

В ходе выполнения работы я приобрела практические навыки по установке и базовому конфигурированию HTTP-сервера Apache.