

Лабораторная работа №4

Базовая настройка HTTP-сервера Apache

Беличева Д. М.

Российский университет дружбы народов, Москва, Россия

Приобрести практические навыки по установке и базовому конфигурированию HTTP-сервера Apache.

1. Установить необходимые для работы HTTP-сервера пакеты.
2. Запустить HTTP-сервер с базовой конфигурацией и проанализируйте его работу.
3. Настроить виртуальный хостинг.
4. Написать скрипт для Vagrant, фиксирующий действия по установке и настройке HTTP-сервера во внутреннем окружении виртуальной машины `server`. Соответствующим образом внесите изменения в `Vagrantfile`

Установка HTTP-сервера

```
[root@server.dmbelicheva.net ~]# dnf -y groupinstall "Basic Web Server"
Rocky Linux 9 - BaseOS                               2.4 kB/s | 4.1 kB    00:01
Rocky Linux 9 - AppStream                             12 kB/s | 4.5 kB    00:00
Rocky Linux 9 - Extras                                852 B/s | 2.9 kB    00:03
Dependencies resolved.
=====
Package                Architecture      Version           Repository        Size
=====
Installing group/module packages:
httpd                  x86_64            2.4.53-11.el9_2.5  appstream         47 k
httpd-manual           noarch            2.4.53-11.el9_2.5  appstream         2.2 M
mod_fcgid               x86_64            2.3.9-28.el9       appstream          74 k
mod_ssl                 x86_64            1:2.4.53-11.el9_2.5 appstream         110 k
Installing dependencies:
apr                    x86_64            1.7.0-11.el9       appstream         123 k
apr-util               x86_64            1.6.1-20.el9_2.1   appstream          94 k
apr-util-bdb           x86_64            1.6.1-20.el9_2.1   appstream          12 k
httpd-core              x86_64            2.4.53-11.el9_2.5  appstream         1.4 M
httpd-filesystem        noarch            2.4.53-11.el9_2.5  appstream          14 k
httpd-tools             x86_64            2.4.53-11.el9_2.5  appstream          81 k
rocky-logos-httpd       noarch            90.14-1.el9        appstream          24 k
Installing weak dependencies:
apr-util-openssl        x86_64            1.6.1-20.el9_2.1   appstream          14 k
mod_http2               x86_64            1.15.19-4.el9_2.4  appstream         149 k
mod_lua                  x86_64            2.4.53-11.el9_2.5  appstream          61 k
Installing Groups:
```

Рис. 1: Установка веб-сервера

Базовое конфигурирование HTTP-сервера

Внесем изменения в настройки межсетевого экрана узла server, разрешив работу с http:

```
[root@server.dmbelicheva.net ~]# firewall-cmd --list-services
cockpit dhcp dhcpv6-client dns ssh
[root@server.dmbelicheva.net ~]# firewall-cmd --get-services
RH-Satellite-6 RH-Satellite-6-capsule afp amanda-client amanda-k5-client amqp amqps apcupsd audit ausweisapp2 bacula
bacula-client-6 bgp bitcoin bitcoin-rpc bitcoin-testnet bitcoin-testnet-rpc bittorrent-lsd ceph ceph-mon cfengine ch
eckmk-agent cockpit collectd condor-collector cratedb ctdb dhcp dhcpv6 dhcpv6-client distcc dns dns-over-tls docker-r
egistry docker-swarm dropbox-lansync elasticsearch etcd-client etcd-server finger foreman foreman-proxy freeipa-4 fre
eipa-ldap freeipa-ldaps freeipa-replication freeipa-trust ftp galera ganglia-client ganglia-master git gpsd grafana g
re high-availability http http3 https ident imap imaps ipfs ipp ipp-client ipsec irc ircs iscsi-target isns jellyfin
jenkins kadmin kdeconnect kerberos kibana klogin kpasswd kprop kshell kube-api kube-apiserver kube-control-plane kube
-control-plane-secure kube-controller-manager kube-controller-manager-secure kube-nodeport-services kube-scheduler ku
be-scheduler-secure kube-worker kubelet kubelet-readonly kubelet-worker ldap ldaps libvirt libvirt-tls lightning-netw
ork llmnr llmnr-tcp llmnr-udp managesieve matrix mdns memcache minidlna mongodb mosh mounsd mqtt mqtt-tls ms-wbt mssq
l murmur mysql nbd netbios-ns netdata-dashboard nfs nfs3 nmea-0183 nrpe ntp nut openvpn ovirt-imageio ovirt-storagec
onsole ovirt-vmconsole plex pmcd pmproxy pmwebapi pmwebapis pop3 pop3s postgresql privoxy prometheus prometheus-node-e
xporter proxy-dhcp ps3netsrv ptp pulseaudio puppetmaster quassel radius rdp redis redis-sentinel rpc-bind rquotad rsh
rsyncd rtsp salt-master samba samba-client samba-dc sane sip sips slp smtp smtp-submission smtps snmp snmptls snmptl
s-trap snmptrap spideroak-lansync spotify-sync squid ssdp ssh steam-streaming svdrp svn syncthing syncthing-gui syner
gy syslog syslog-tls telnet tentacle tftp tile38 tinc tor-socks transmission-client upnp-client vdsim vnc-server wbem-
http wbm-http wireguard ws-discovery ws-discovery-client ws-discovery-tcp ws-discovery-udp wsmn wsmans xdmcp xmpp-
bosh xmpp-client xmpp-local xmpp-server zabbix-agent zabbix-server zerotier
[root@server.dmbelicheva.net ~]# firewall-cmd --add-service=http
success
[root@server.dmbelicheva.net ~]# firewall-cmd --add-service=http --permanent
success
[root@server.dmbelicheva.net ~]#
```

Рис. 2: Команда firewall

Выполнение лабораторной работы

```
[root@server.dmbelicheva.net ~]# journalctl -x -f
Nov 13 14:18:28 server.dmbelicheva.net systemd[1]: Starting Cleanup of Temporary Directories...
    Subject: A start job for unit systemd-tmpfiles-clean.service has begun execution
    Defined-By: systemd
    Support: https://access.redhat.com/support

    A start job for unit systemd-tmpfiles-clean.service has begun execution.

    The job identifier is 2727.
Nov 13 14:18:28 server.dmbelicheva.net systemd[1]: systemd-tmpfiles-clean.service: Deactivated successfully.
    Subject: Unit succeeded
    Defined-By: systemd
    Support: https://access.redhat.com/support

    The unit systemd-tmpfiles-clean.service has successfully entered the 'dead' state.
Nov 13 14:18:28 server.dmbelicheva.net systemd[1]: Finished Cleanup of Temporary Directories.
    Subject: A start job for unit systemd-tmpfiles-clean.service has finished successfully
    Defined-By: systemd
    Support: https://access.redhat.com/support

    A start job for unit systemd-tmpfiles-clean.service has finished successfully.

    The job identifier is 2727.
Nov 13 14:18:28 server.dmbelicheva.net systemd[1]: run-credentials-systemd\x2dtmpfiles\x2dclean.service.mount: Deactivated successfully.
    Subject: Unit succeeded
    Defined-By: systemd
    Support: https://access.redhat.com/support

    The unit run-credentials-systemd\x2dtmpfiles\x2dclean.service.mount has successfully entered the 'dead' state.
Nov 13 14:28:01 server.dmbelicheva.net systemd[5590]: Started Application launched by gnome-shell.
    Subject: A start job for unit UNIT has finished successfully
```

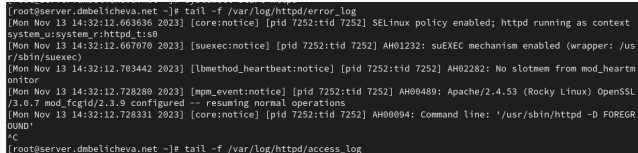
Рис. 3: Расширенный лог системных сообщений

```
[root@server.dmbelicheva.net ~]# systemctl enable httpd
Created symlink /etc/systemd/system/multi-user.target.wants/httpd.service → /usr/lib/systemd/system/httpd.service.
[root@server.dmbelicheva.net ~]# systemctl start httpd
```

Рис. 4: Активация и запуск HTTP-сервер

Анализ работы HTTP-сервера

Запустим виртуальную машину client: *make client-up*.

A terminal window showing the output of the 'tail -f /var/log/httpd/error_log' command. The logs show various system and httpd messages, including SELinux policy enabling, suEXEC mechanism enabling, and httpd startup messages. The terminal text is as follows:

```
[root@server.dmbelicheva.net ~]# tail -f /var/log/httpd/error_log
[Mon Nov 13 14:32:12.663636 2023] [core:notice] [pid 7252:tid 7252] SELinux policy enabled; httpd running as context
system_u:system_r:httpd_t:s0
[Mon Nov 13 14:32:12.667070 2023] [suexec:notice] [pid 7252:tid 7252] AH01232: suEXEC mechanism enabled (wrapper: /usr/sbin/suexec)
[Mon Nov 13 14:32:12.703442 2023] [lbmethod_heartbeat:notice] [pid 7252:tid 7252] AH02282: No slotmem from mod_heartmonitor
[Mon Nov 13 14:32:12.728280 2023] [mpm_event:notice] [pid 7252:tid 7252] AH00489: Apache/2.4.53 (Rocky Linux) OpenSSL/3.0.7 mod_fcgid/2.3.9 configured -- resuming normal operations
[Mon Nov 13 14:32:12.728331 2023] [core:notice] [pid 7252:tid 7252] AH00094: Command line: '/usr/sbin/httpd -D FOREGROUND'
^C
[root@server.dmbelicheva.net ~]# tail -f /var/log/httpd/access_log
```

Рис. 5: Лог ошибок и мониторинг доступа

Выполнение лабораторной работы

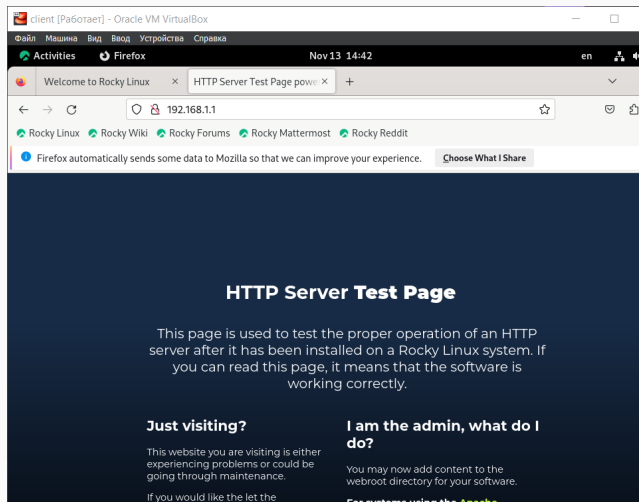
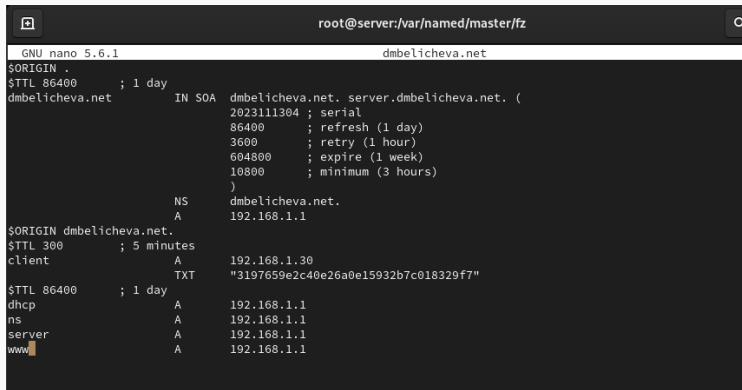


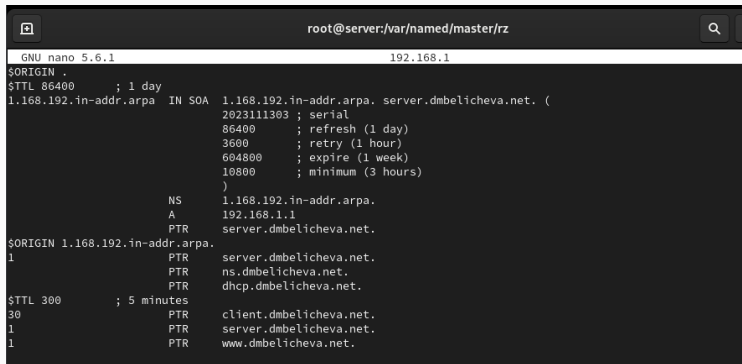
Рис. 6: Тестовая страница

Настройка виртуального хостинга для HTTP-сервера



```
root@server:/var/named/master/fz
GNU nano 5.6.1 dmbelicheva.net
$ORIGIN .
$TTL 86400      ; 1 day
dmbelicheva.net IN SOA dmbelicheva.net. server.dmbelicheva.net. (
                        2023111304 ; serial
                        86400      ; refresh (1 day)
                        3600        ; retry (1 hour)
                        604800      ; expire (1 week)
                        10800       ; minimum (3 hours)
                        )
                        NS      dmbelicheva.net.
                        A       192.168.1.1
$ORIGIN dmbelicheva.net.
$TTL 300        ; 5 minutes
client          A       192.168.1.30
                TXT      "3197659e2c40e26a0e15932b7c018329f7"
$TTL 86400      ; 1 day
dhcp            A       192.168.1.1
ns              A       192.168.1.1
server          A       192.168.1.1
www             A       192.168.1.1
```

Рис. 7: Файл прямой зоны



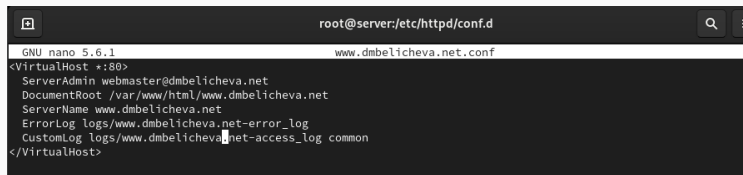
```
root@server:/var/named/master/rz
GNU nano 5.6.1                                192.168.1
$ORIGIN .
$TTL 86400          ; 1 day
1.168.192.in-addr.arpa IN SOA 1.168.192.in-addr.arpa. server.dmbelicheva.net. (
                                2023111303 ; serial
                                86400      ; refresh (1 day)
                                3600       ; retry (1 hour)
                                604800    ; expire (1 week)
                                10800     ; minimum (3 hours)
                                )
                                NS      1.168.192.in-addr.arpa.
                                A      192.168.1.1
                                PTR    server.dmbelicheva.net.
$ORIGIN 1.168.192.in-addr.arpa.
1 PTR server.dmbelicheva.net.
  PTR ns.dmbelicheva.net.
  PTR dhcp.dmbelicheva.net.
$TTL 300          ; 5 minutes
30 PTR client.dmbelicheva.net.
1 PTR server.dmbelicheva.net.
1 PTR www.dmbelicheva.net.
```

Рис. 8: Файл обратной зоны



```
root@server:/etc/httpd/conf.d
GNU nano 5.6.1 server.dmbelicheva.net.conf
<VirtualHost *:80>
  ServerAdmin webmaster@dmbelicheva.net
  DocumentRoot /var/www/html/server.dmbelicheva.net
  ServerName server.dmbelicheva.net
  ErrorLog logs/server.dmbelicheva.net-error_log
  CustomLog logs/server.dmbelicheva.net-access_log common
</VirtualHost>
```

Рис. 9: Редактирование файл server.dmbelicheva.net.conf



```
root@server:/etc/httpd/conf.d
GNU nano 5.6.1 www.dmbelicheva.net.conf
<VirtualHost *:80>
  ServerAdmin webmaster@dmbelicheva.net
  DocumentRoot /var/www/html/www.dmbelicheva.net
  ServerName www.dmbelicheva.net
  ErrorLog logs/www.dmbelicheva.net-error_log
  CustomLog logs/www.dmbelicheva.net-access_log common
</VirtualHost>
```

Рис. 10: Редактирование файл `www.dmbelicheva.net.conf`

```
cd /var/www/html  
mkdir server.dmbelicheva.net  
cd /var/www/html/server.dmbelicheva.net  
touch index.html
```

Откроем на редактирование файл index.html и внесем следующее содержание: *Welcome to the server.dmbelicheva.net server.*

Для виртуального веб-сервера `www.dmbelicheva.net`:

```
cd /var/www/html
```

```
mkdir www.dmbelicheva.net
```

```
cd /var/www/html/www.dmbelicheva.net
```

```
touch index.html
```

Откроем на редактирование файл `index.html` и внесем следующее содержание: *Welcome to the `www.dmbelicheva.net` server.*

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

Рис. 11: Редактирование файла

Выполнение лабораторной работы

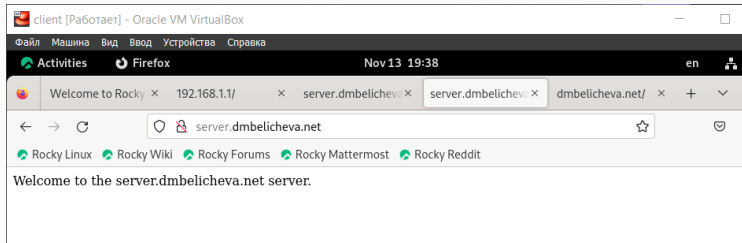
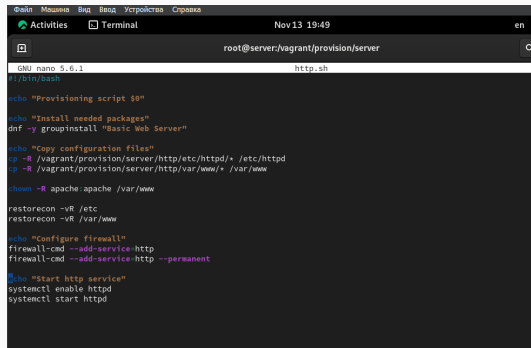


Рис. 12: Содержимое сайта

Внесение изменений в настройки внутреннего окружения виртуальной машины



The screenshot shows a terminal window titled "Terminal" with a date and time of "Nov 13 19:49". The user is logged in as "root" at "server:/vagrant/provision/server". The terminal displays the contents of a file named "http.sh" being edited with the nano text editor. The script contains several commands for installing packages, copying configuration files, setting permissions, restoring permissions, and configuring the firewall.

```
GNU nano 5.6.1 http.sh
#!/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. 13: Редактирование файла

Для отработки созданного скрипта во время загрузки виртуальных машин в конфигурационном файле Vagrantfile необходимо добавить в конфигурации сервера следующую запись:

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

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