

Администрирование сетевых подсистем

Лабораторная работа №4

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Информация

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

Выполнение лабораторной работы

```
[root@server ~]# LANG=C yum grouplist
Extra Packages for Enterprise Linux 9 - x86_6 20 kB/s | 33 kB 00:01
^[[tExtra Packages for 98% [=====] 4.6 MB/s | 20 MB 00:00 E
Extra Packages for Enterprise Linux 9 - x86_6 5.3 MB/s | 20 MB 00:03
Rocky Linux 9 - BaseOS 2.6 kB/s | 4.3 kB 00:01
Rocky Linux 9 - BaseOS 4.1 MB/s | 3.8 MB 00:00
Rocky Linux 9 - AppStream 13 kB/s | 4.8 kB 00:00
Rocky Linux 9 - AppStream 4.2 MB/s | 9.4 MB 00:02
Rocky Linux 9 - Extras 8.3 kB/s | 3.1 kB 00:00
Rocky Linux 9 - Extras 34 kB/s | 16 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
  VideoLAN Client
  Xfce
```

Рис. 1: Установка требуемого программного обеспечения

```
[root@server ~]# dnf -y groupinstall "Basic Web Server"
Last metadata expiration check: 0:00:51 ago on Tue 02 Dec 2025 04:30:53 PM MSK
Dependencies resolved.
=====
Package                Arch      Version              Repository           Size
=====
Installing group/module packages:
httpd                  x86_64    2.4.62-7.el9         appstream            44 k
httpd-manual            noarch    2.4.62-7.el9         appstream            2.2 M
mod_fcgid               x86_64    2.3.9-28.el9         appstream            74 k
mod_ssl                 x86_64    1:2.4.62-7.el9       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    2.4.62-7.el9         appstream            1.4 M
httpd-filesystem         noarch    2.4.62-7.el9         appstream            11 k
httpd-tools              x86_64    2.4.62-7.el9         appstream            78 k
rocky-logos-httpd        noarch    90.16-1.el9          appstream            24 k
Installing weak dependencies:
```

Рис. 2: Установка требуемого программного обеспечения

```
[root@server ~]# firewall-cmd --list-services
cockpit dhcp dhcpv6-client dns ssh
[root@server ~]# 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 bareos-director bareos-fi
ledaemon bareos-storage bb bgp bitcoin bitcoin-rpc bitcoin-testnet bitcoin-tes
tnet-rpc bittorrent-lsd ceph ceph-exporter ceph-mon cfengine checkmk-agent coc
kpit collectd condor-collector cratedb ctdb dds dds-multicast dds-unicast dhcp
dhcpv6 dhcpv6-client distcc dns dns-over-tls docker-registry docker-swarm dro
pbox-lansync elasticsearch etcd-client etcd-server finger foreman foreman-prox
y freeipa-4 freeipa-ldap freeipa-ldaps freeipa-replication freeipa-trust ftp g
alera ganglia-client ganglia-master git gssd grafana gre high-availability htt
p http3 https ident imap imaps ipfs ipp ipp-client ipsec irc ircs iscsi-target
isns jenkins kadmin kdeconnect kerberos kibana klogin kpasswd kprop kshell ku
be-api kube-apiserver kube-control-plane kube-control-plane-secure kube-contro
ller-manager kube-controller-manager-secure kube-nodeport-services kube-schedu
ler kube-scheduler-secure kube-worker kubelet kubelet-readonly kubelet-worker
ldap ldaps libvirt libvirt-tls lightning-network llmnr llmnr-client llmnr-tcp
llmnr-udp managesieve matrix mdns memcache minidlna mongodb mosh mountd mqtt m
qtt-tls ms-wbt mssql murmur mysql nbd nebula netbios-ns netdata-dashboard nfs
nfs3 nmea-0183 nrpe ntp nut openvpn ovirt-imageio pvirt-storageconsole ovirt-v
mconsole plex pmcd pmproxy pmwebapi pmwebapis pop3 pop3s postgresql privoxy pr
ometheus prometheus-node-exporter proxy-dhcp ps2link ps3netshr ptp pulseaudio
puppetmaster quassel radius rdp redis redis-sentinel rpc-bind rquodad rsh rsyn
cd rtsp salt-master samba samba-client samba-dc sane sip sips slp smtp smtp-su
bmission smtps snmp snmpv1 snmpv2 snmpv3 snmptrap spideroak-lansync spotify-sy
nc squid ssdp ssh steam-streaming svdrpn svn syncthing syncthing-gui syncthing-
relay synergy syslog syslog-tls telnet tentacle tftp tile38 tinc tor-socks tra
nsmission-client upnp-client vds vnc-server warpinator wbem-http wbem-https w
ireguard ws-discovery ws-discovery-client ws-discovery-tcp ws-discovery-udp ws
man wsmans xdmcp xmpp-bosh xmpp-client xmpp-local xmpp-server zabbix-agent zab
bix-server zerotier
[root@server ~]# firewall-cmd --add-service=http
success
[root@server ~]# firewall-cmd --add-service=http --permanent
success
[root@server ~]#
```

Рис. 3: Внесение правок в настройки межсетевого экрана

```
root@server:~ × user@server:~ — journalctl -x -f ×
Defined-By: systemd
Support: https://wiki.rockylinux.org/rocky/support

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

The job identifier is 3130.
Dec 02 16:43:53 server systemd[1]: httpd-init.service: Consumed 4.342s CPU time.
Subject: Resources consumed by unit runtime
Defined-By: systemd
Support: https://wiki.rockylinux.org/rocky/support

The unit httpd-init.service completed and consumed the indicated resources.
Dec 02 16:43:53 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 3053.
Dec 02 16:43:53 server httpd[43720]: 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
Dec 02 16:43:53 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 3053.
Dec 02 16:43:53 server httpd[43720]: Server configured, listening on: port 443 port 80
```

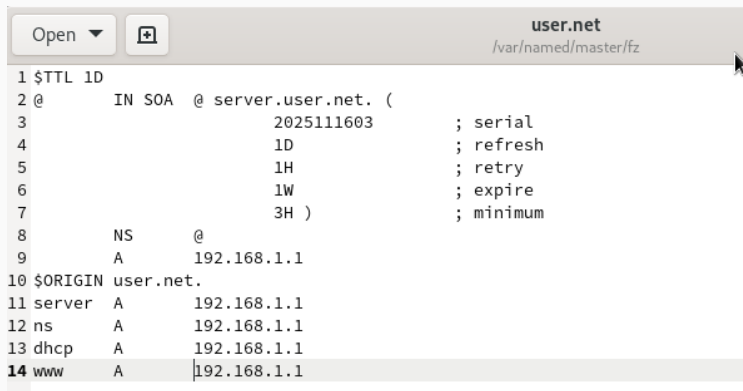
Рис. 4: Расширенный лог системных сообщений


```
[root@server ~]# tail -f /var/log/httpd/error_log
[Tue Dec 02 16:43:53.422751 2025] [core:notice] [pid 43720:tid 43720] SELinux
policy enabled; httpd running as context system_u:system_r:httpd_t:s0
[Tue Dec 02 16:43:53.423330 2025] [suexec:notice] [pid 43720:tid 43720] AH0123
2: suEXEC mechanism enabled (wrapper: /usr/sbin/suexec)
[Tue Dec 02 16:43:53.423338 2025] [ssl:warn] [pid 43720:tid 43720] AH01882: In
it: this version of mod_ssl was compiled against a newer library (OpenSSL 3.5.
1 1 Jul 2025 (OpenSSL 3.0.7 1 Nov 2022), version currently loaded is 0x3000007
0) - may result in undefined or erroneous behavior
AH00558: httpd: Could not reliably determine the server's fully qualified doma
in name, using 127.0.1.1. Set the 'ServerName' directive globally to suppress
this message
[Tue Dec 02 16:43:53.435985 2025] [ssl:warn] [pid 43720:tid 43720] AH01882: In
it: this version of mod_ssl was compiled against a newer library (OpenSSL 3.5.
1 1 Jul 2025 (OpenSSL 3.0.7 1 Nov 2022), version currently loaded is 0x3000007
0) - may result in undefined or erroneous behavior
[Tue Dec 02 16:43:53.437302 2025] [lbmethod_heartbeat:notice] [pid 43720:tid 4
3720] AH02282: No slotmem from mod_heartbeat
[Tue Dec 02 16:43:53.445118 2025] [mpm_event:notice] [pid 43720:tid 43720] AH0
0489: Apache/2.4.62 (Rocky Linux) OpenSSL/3.0.7 mod_fcgid/2.3.9 configured --
resuming normal operations
[Tue Dec 02 16:43:53.445159 2025] [core:notice] [pid 43720:tid 43720] AH00094:
Command line: '/usr/sbin/httpd -D FOREGROUND'
[Tue Dec 02 16:49:07.252943 2025] [autoindex:error] [pid 43726:tid 43825] [cli
ent 192.168.1.30:39842] AH01276: Cannot serve directory /var/www/html/: No mat
ching DirectoryIndex (index.html) found, and server-generated directory index
forbidden by Options directive
```

Рис. 5: Мониторинг ошибок

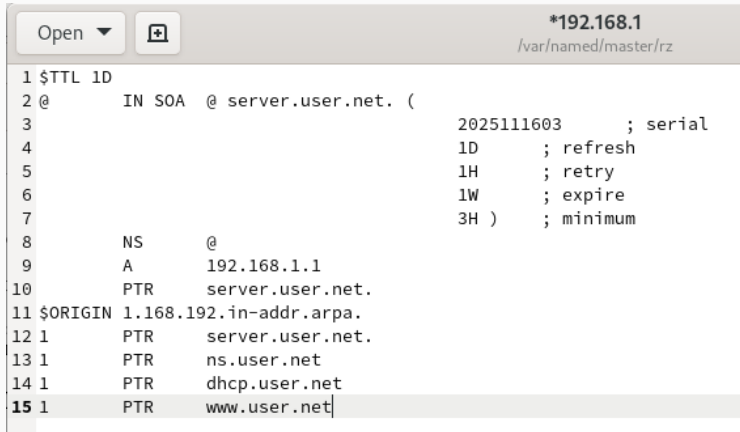
```
[root@server ~]# tail -f /var/log/httpd/access_log
192.168.1.30 - - [02/Dec/2025:16:49:07 +0300] "GET / HTTP/1.1" 403 7620 "-" "Mozilla/5.0 (X11; Linux x86_64; rv:109.0) Gecko/20100101 Firefox/115.0"
192.168.1.30 - - [02/Dec/2025:16:49:07 +0300] "GET /icons/poweredby.png HTTP/1.1" 200 15443 "http://192.168.1.1/" "Mozilla/5.0 (X11; Linux x86_64; rv:109.0) Gecko/20100101 Firefox/115.0"
192.168.1.30 - - [02/Dec/2025:16:49:07 +0300] "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 - - [02/Dec/2025:16:49:07 +0300] "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. 6: Мониторинг доступа



```
1 $TTL 1D
2 @      IN SOA  @ server.user.net. (
3                               2025111603      ; serial
4                               1D              ; refresh
5                               1H              ; retry
6                               1W              ; expire
7                               3H )            ; minimum
8      NS   @
9      A    192.168.1.1
10 $ORIGIN user.net.
11 server A    192.168.1.1
12 ns     A    192.168.1.1
13 dhcp   A    192.168.1.1
14 www    A    192.168.1.1
```

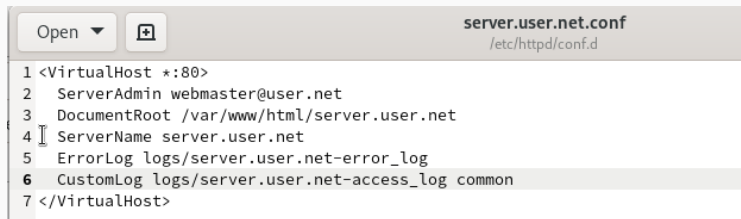
Рис. 7: Внесение HTTP в файл прямой зоны



The screenshot shows a text editor window with a title bar containing an "Open" button, a file icon, and the filename `*192.168.1` with the path `/var/named/master/rz`. The editor displays a reverse zone file configuration for the 192.168.1 network. The configuration includes a TTL, an SOA record, and several PTR records for the reverse lookup of IP addresses. The 15th line, which adds a PTR record for the www subdomain, is highlighted.

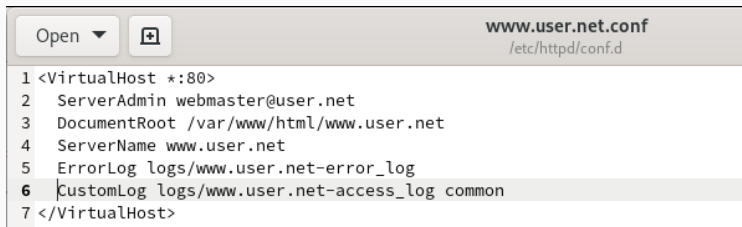
```
1 $TTL 1D
2 @      IN SOA  @ server.user.net. (
3                                     2025111603      ; serial
4                                     1D              ; refresh
5                                     1H              ; retry
6                                     1W              ; expire
7                                     3H )            ; minimum
8      NS   @
9      A    192.168.1.1
10     PTR   server.user.net.
11 $ORIGIN 1.168.192.in-addr.arpa.
12 1       PTR   server.user.net.
13 1       PTR   ns.user.net
14 1       PTR   dhcp.user.net
15 1       PTR   www.user.net
```

Рис. 8: Внесение HTTP в файл обратной зоны



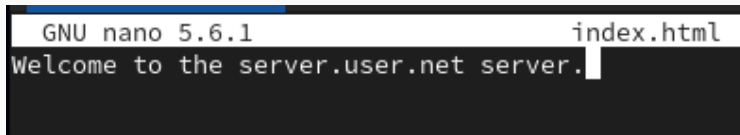
```
1 <VirtualHost *:80>
2   ServerAdmin webmaster@user.net
3   DocumentRoot /var/www/html/server.user.net
4   ServerName server.user.net
5   ErrorLog logs/server.user.net-error_log
6   CustomLog logs/server.user.net-access_log common
7 </VirtualHost>
```

Рис. 9: server.user.net.conf



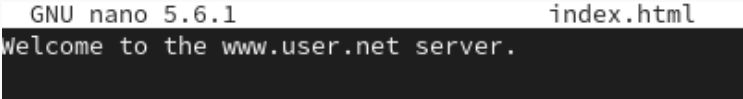
```
1 <VirtualHost *:80>
2   ServerAdmin webmaster@user.net
3   DocumentRoot /var/www/html/www.user.net
4   ServerName www.user.net
5   ErrorLog logs/www.user.net-error_log
6   CustomLog logs/www.user.net-access_log common
7 </VirtualHost>
```

Рис. 10: www.user.net.conf



```
GNU nano 5.6.1 index.html
Welcome to the server.user.net server.
```

Рис. 11: index.html для server.user.net



```
GNU nano 5.6.1 index.html  
welcome to the www.user.net server.
```

Рис. 12: index.html для www.user.net

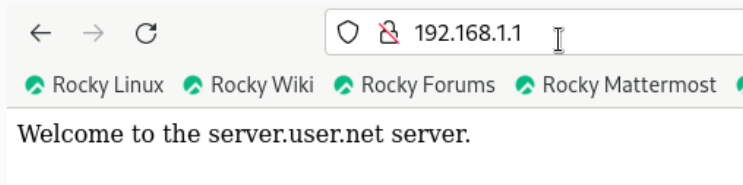


Рис. 13: Результат открытия адреса

```
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. 14: http.sh

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

Рис. 15: Изменения в Vagrantfile

В процессе выполнения данной лабораторной работы я освоил установку и базовое конфигурирование HTTP-сервера Apache.