

# Лабораторная работа №5

Расширенная настройка HTTP-сервера Apache

Махорин Иван Сергеевич

1032211221

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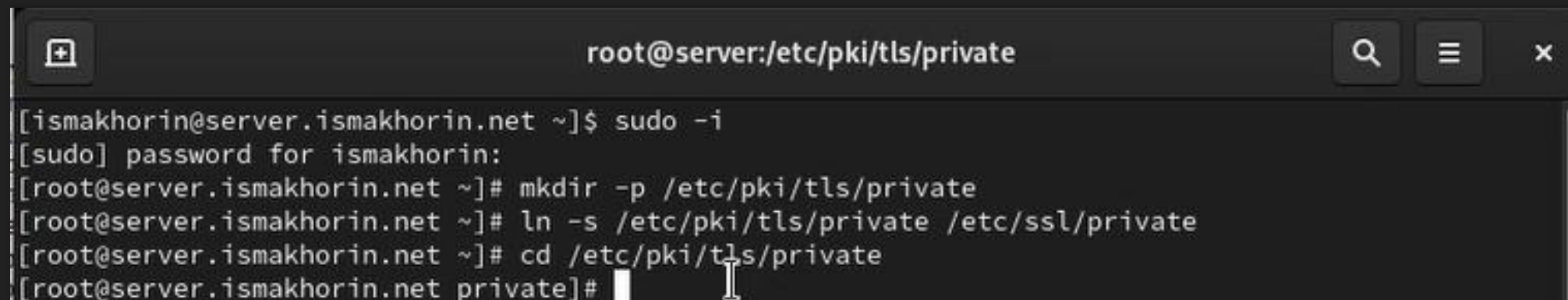
# Конфигурирование HTTP-сервера для работы через протокол HTTPS



```
ismakhorin@ismakhorin: /var/tmp/ismakhorin/vagrant
ismakhorin@ismakhorin:~$ cd /var/tmp/ismakhorin/vagrant
ismakhorin@ismakhorin:/var/tmp/ismakhorin/vagrant$ make server-up
Bringing machine 'server' up with 'virtualbox' provider...
==> server: You assigned a static IP ending in ".1" to this machine.
==> server: This is very often used by the router and can cause the
==> server: network to not work properly. If the network doesn't work
==> server: properly, try changing this IP.
==> server: You assigned a static IP ending in ".1" to this machine.
==> server: This is very often used by the router and can cause the
==> server: network to not work properly. If the network doesn't work
==> server: properly, try changing this IP.
==> server: Clearing any previously set forwarded ports...
```

Рис. 1.1. Открытие рабочего каталога с проектом и запуск виртуальной машины server.

# Конфигурирование HTTP-сервера для работы через протокол HTTPS



```
root@server:/etc/pki/tls/private

[ismakhorin@server.ismakhorin.net ~]$ sudo -i
[sudo] password for ismakhorin:
[root@server.ismakhorin.net ~]# mkdir -p /etc/pki/tls/private
[root@server.ismakhorin.net ~]# ln -s /etc/pki/tls/private /etc/ssl/private
[root@server.ismakhorin.net ~]# cd /etc/pki/tls/private
[root@server.ismakhorin.net private]#
```

Рис. 1.2. Переход в режим суперпользователя и создание в каталоге /etc/ssl каталога private.

# Конфигурирование HTTP-сервера для работы через протокол HTTPS

[illegible]

### Рис. 1.3. Генерация ключа.



# Конфигурирование HTTP-сервера для работы через протокол HTTPS

```
[root@server.ismakhorin.net private]# mv www.ismakhorin.net.crt /etc/pki/tls/certs  
mv: overwrite '/etc/pki/tls/certs/www.ismakhorin.net.crt'? █
```

Рис. 1.4. Генерация сертификата.

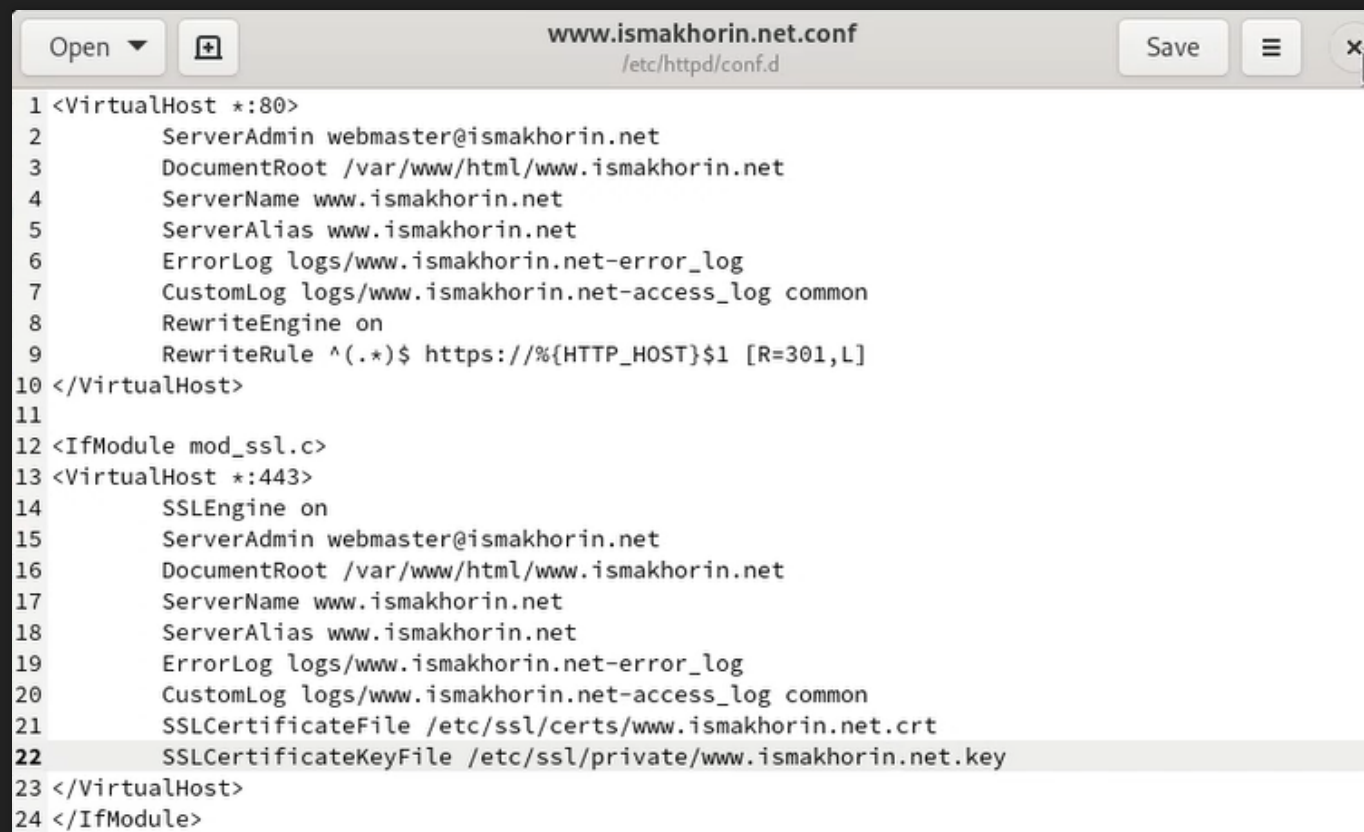
# Конфигурирование HTTP-сервера для работы через протокол HTTPS



```
root@server:/etc/httpd/conf.d
[root@server.ismakhorin.net private]# cd /etc/httpd/conf.d
[root@server.ismakhorin.net conf.d]# gedit /etc/httpd/conf.d/www.ismakhorin.net.conf
```

**Рис. 1.5.** Открытие каталога с конфигурационными файлами.

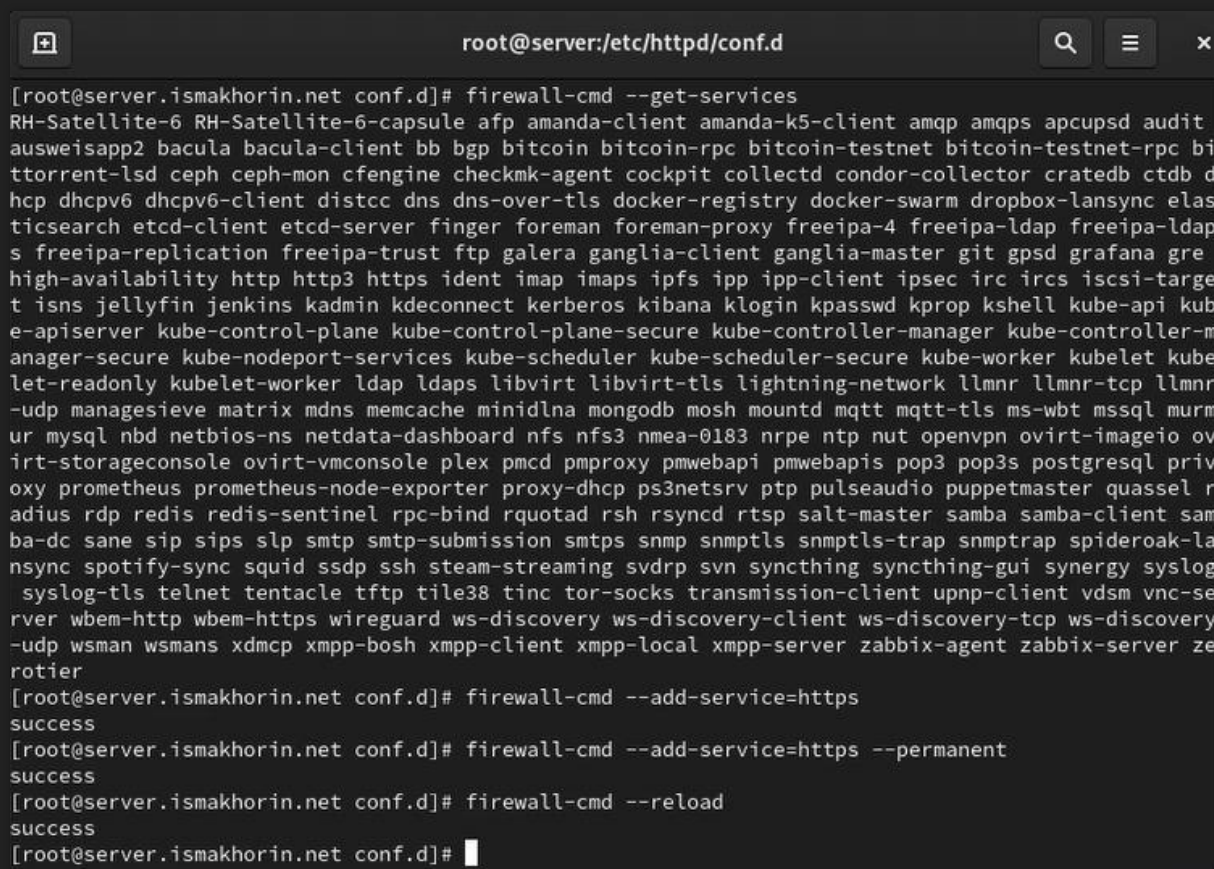
# Конфигурирование HTTP-сервера для работы через протокол HTTPS



```
1 <VirtualHost *:80>
2     ServerAdmin webmaster@ismakhorin.net
3     DocumentRoot /var/www/html/www.ismakhorin.net
4     ServerName www.ismakhorin.net
5     ServerAlias www.ismakhorin.net
6     ErrorLog logs/www.ismakhorin.net-error_log
7     CustomLog logs/www.ismakhorin.net-access_log common
8     RewriteEngine on
9     RewriteRule ^(.*)$ https://%{HTTP_HOST}$1 [R=301,L]
10 </VirtualHost>
11
12 <IfModule mod_ssl.c>
13 <VirtualHost *:443>
14     SSLEngine on
15     ServerAdmin webmaster@ismakhorin.net
16     DocumentRoot /var/www/html/www.ismakhorin.net
17     ServerName www.ismakhorin.net
18     ServerAlias www.ismakhorin.net
19     ErrorLog logs/www.ismakhorin.net-error_log
20     CustomLog logs/www.ismakhorin.net-access_log common
21     SSLCertificateFile /etc/ssl/certs/www.ismakhorin.net.crt
22     SSLCertificateKeyFile /etc/ssl/private/www.ismakhorin.net.key
23 </VirtualHost>
24 </IfModule>
```

**Рис. 1.6.** Открытие файла `/etc/httpd/conf.d/www.ismakhorin.net.conf` на редактирование и замена содержимого.

# Конфигурирование HTTP-сервера для работы через протокол HTTPS

A terminal window titled 'root@server:/etc/httpd/conf.d' with search, menu, and close icons. It displays the output of the 'firewall-cmd --get-services' command, listing numerous services including http and https. Subsequent commands 'firewall-cmd --add-service=https' and 'firewall-cmd --add-service=https --permanent' are executed successfully. Finally, 'firewall-cmd --reload' is also successful. The prompt returns to the root user at the server.

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

[root@server.ismakhorin.net conf.d]# 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 bb bgp bitcoin bitcoin-rpc bitcoin-testnet bitcoin-testnet-rpc bi
ttorrent-bsd ceph ceph-mon cfengine checkmk-agent cockpit collectd condor-collector cratedb ctdb d
hcp dhcpv6 dhcpv6-client distcc dns dns-over-tls docker-registry docker-swarm dropbox-lansync elas
ticsearch etcd-client etcd-server finger foreman foreman-proxy freeipa-4 freeipa-ldap freeipa-ldap
s freeipa-replication freeipa-trust ftp galera ganglia-client ganglia-master git gpsd grafana gre
high-availability http http3 https ident imap imaps ipfs ipp ipp-client ipsec irc ircs iscsi-targe
t isns jellyfin jenkins kadmin kdeconnect kerberos kibana klogin kpasswd kprop kshell kube-api kub
e-apiserver kube-control-plane kube-control-plane-secure kube-controller-manager kube-controller-m
anager-secure kube-nodeport-services kube-scheduler kube-scheduler-secure kube-worker kubelet kube
let-readonly kubelet-worker ldap ldaps libvirt libvirt-tls lightning-network llmnr llmnr-tcp llmnr
-udp managesieve matrix mdns memcache minidlna mongodb mosh mountd mqtt mqtt-tls ms-wbt mssql murm
ur mysql nbd netbios-ns netdata-dashboard nfs nfs3 nmea-0183 nrpe ntp nut openvpn ovirt-imageio ov
irt-storageconsole ovirt-vmconsole plex pmcd pmproxy pmwebapi pmwebapis pop3 pop3s postgresql priv
oxy prometheus prometheus-node-exporter proxy-dhcp ps3netshr ptp pulseaudio puppetmaster quassel r
adius rdp redis redis-sentinel rpc-bind rquotad rsh rsyncd rtsp salt-master samba samba-client sam
ba-dc sane sip sips slp smtp smtp-submission smtps snmp snmptls snmptls-trap snmptrap spideroak-la
nsync spotify-sync squid ssdp ssh steam-streaming svdrp svn syncthing syncthing-gui synergy syslog
syslog-tls telnet tentacle tftp tile38 tinc tor-socks transmission-client upnp-client vdsms vnc-se
rver wbem-http wbem-https wireguard ws-discovery ws-discovery-client ws-discovery-tcp ws-discovery
-udp wsman wsmans xdmcp xmpp-bosh xmpp-client xmpp-local xmpp-server zabbix-agent zabbix-server ze
rotier

[root@server.ismakhorin.net conf.d]# firewall-cmd --add-service=https
success

[root@server.ismakhorin.net conf.d]# firewall-cmd --add-service=https --permanent
success

[root@server.ismakhorin.net conf.d]# firewall-cmd --reload
success

[root@server.ismakhorin.net conf.d]#
```

**Рис. 1.7.** Внесение изменений в настройки межсетевого экрана на сервере, разрешив работу с https.



# Конфигурирование HTTP-сервера для работы через протокол HTTPS

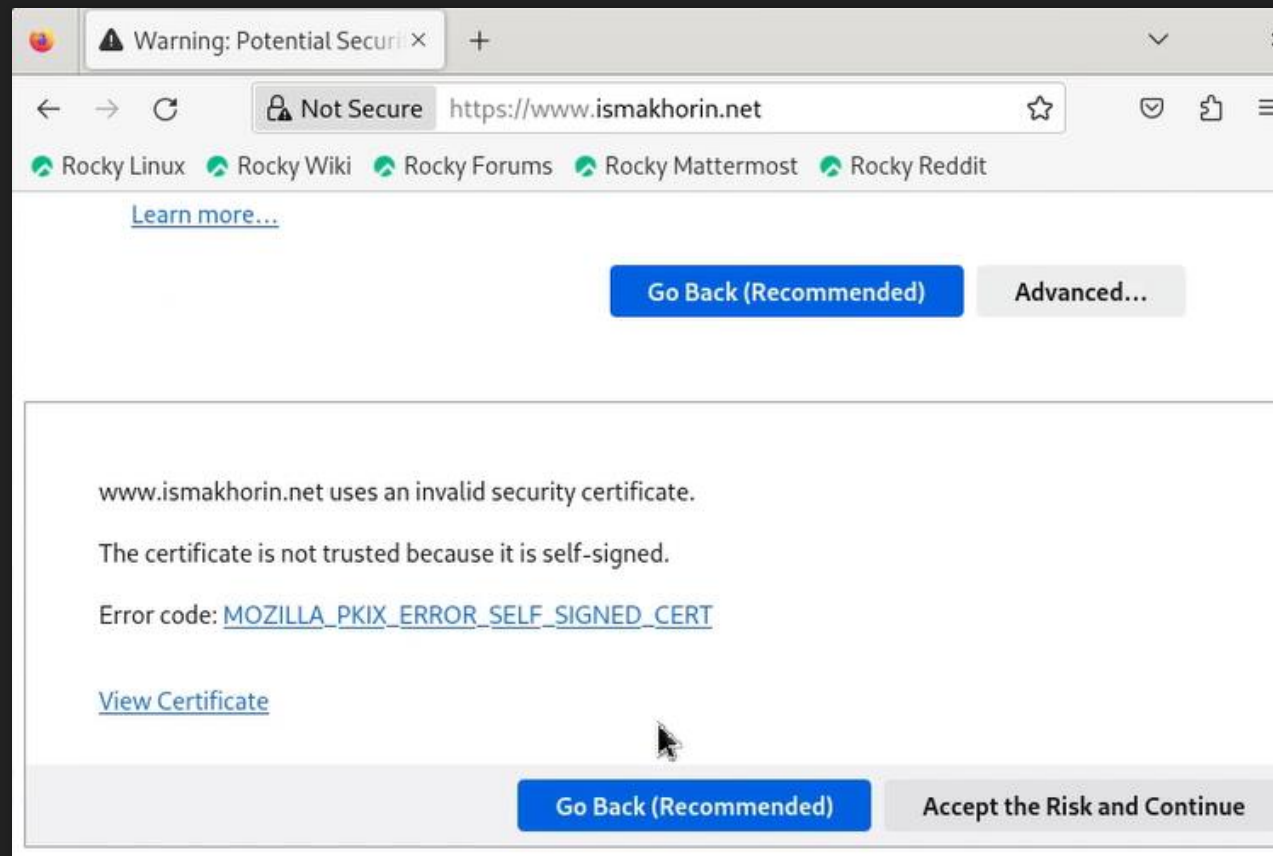


A terminal window with a dark background. The title bar shows a window icon, the text 'root@server:/etc/httpd/conf.d', and search, menu, and close buttons. The terminal content shows the command 'systemctl restart httpd' being entered at the prompt '[root@server.ismakhorin.net conf.d]#'. A cursor is visible at the end of the command line.

```
root@server:/etc/httpd/conf.d  
[root@server.ismakhorin.net conf.d]# systemctl restart httpd
```

Рис. 1.8. Перезапуск веб-сервера.

# Конфигурирование HTTP-сервера для работы через протокол HTTPS



**Рис. 1.9.** Открытие веб-сервера [www.ismakhorin.net](https://www.ismakhorin.net) и автоматическое переключение на работу по протоколу HTTPS.

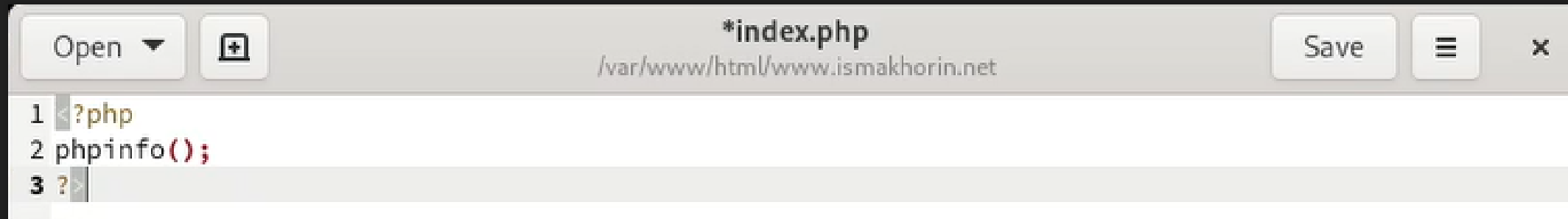
# Конфигурирование HTTP-сервера для работы с PHP

```
root@server:/etc/httpd/conf.d
[root@server.ismakhorin.net conf.d]# dnf -y install php
Rocky Linux 9 - BaseOS                    5.1 kB/s | 4.1 kB      00:00
Rocky Linux 9 - AppStream                  7.9 kB/s | 4.5 kB      00:00
Rocky Linux 9 - Extras                     5.5 kB/s | 2.9 kB      00:00
Dependencies resolved.
=====
Package                                Architecture  Version              Repository           Size
=====
Installing:
php                                    x86_64        8.0.30-1.el9_2       appstream            7.7 k
Installing dependencies:
nginxfilesystem                       noarch        1:1.20.1-14.el9_2.1  appstream            8.5 k
php-common                             x86_64        8.0.30-1.el9_2       appstream            665 k
Installing weak dependencies:
php-cli                               x86_64        8.0.30-1.el9_2       appstream            3.1 M
php-fpm                               x86_64        8.0.30-1.el9_2       appstream            1.6 M
php-mbstring                           x86_64        8.0.30-1.el9_2       appstream            468 k
php-opcache                            x86_64        8.0.30-1.el9_2       appstream            509 k
php-pdo                                x86_64        8.0.30-1.el9_2       appstream            81 k
php-xml                                x86_64        8.0.30-1.el9_2       appstream            131 k
Transaction Summary
=====
Install 9 Packages

Total download size: 6.5 M
Installed size: 35 M
Downloading Packages:
(1/9): nginxfilesystem-1.20.1-14.el9_2.1.noarch.rpm    14 kB/s | 8.5 kB      00:00
(2-3/9): php-pdo-8.0.30-1.el9_1% [                    ] 255 kB/s | 72 kB      00:25 ETA
```

Рис. 2.1. Установка пакетов для работы с PHP.

# Конфигурирование HTTP-сервера для работы с PHP

A screenshot of a code editor window. The title bar shows the file name '\*index.php' and the path '/var/www/html/www.ismakhorin.net'. The editor contains three lines of PHP code: line 1 is '<?php', line 2 is 'phpinfo();', and line 3 is '?>'. The interface includes an 'Open' button with a dropdown arrow, a '+' icon, a 'Save' button, a menu icon (three horizontal lines), and a close 'x' button.

```
1 <?php
2 phpinfo();
3 ?>
```

**Рис. 2.2.** Замена файла index.html на index.php с содержанием из лабораторной работы.



# Конфигурирование HTTP-сервера для работы с PHP

A terminal window with a dark background and light text. The title bar shows the path 'root@server:/var/www/html/www.ismakhorin.net'. The terminal contains several commands and their outputs: 'chown -R apache:apache /var/www', 'restorecon -vR /etc' followed by a detailed SELinux relabeling message for '/etc/sysconfig/network-scripts/ifcfg-eth1', 'restorecon -vR /var/www', 'restorecon -vR /etc/named', and 'systemctl restart httpd'.

```
root@server:/var/www/html/www.ismakhorin.net

[root@server.ismakhorin.net www.ismakhorin.net]# chown -R apache:apache /var/www
[root@server.ismakhorin.net www.ismakhorin.net]# restorecon -vR /etc
Relabeled /etc/sysconfig/network-scripts/ifcfg-eth1 from unconfined_u:object_r:user_tmp_t:s0 to unconfined_u:object_r:net_conf_t:s0
[root@server.ismakhorin.net www.ismakhorin.net]# restorecon -vR /var/www
[root@server.ismakhorin.net www.ismakhorin.net]# restorecon -vR /etc/named
[root@server.ismakhorin.net www.ismakhorin.net]# systemctl restart httpd
```

**Рис. 2.3.** Корректировка прав доступа в каталог с веб-контентом, восстановление контекста безопасности в SELinux и перезапуск HTTP-сервера.

# Конфигурирование HTTP-сервера для работы с PHP

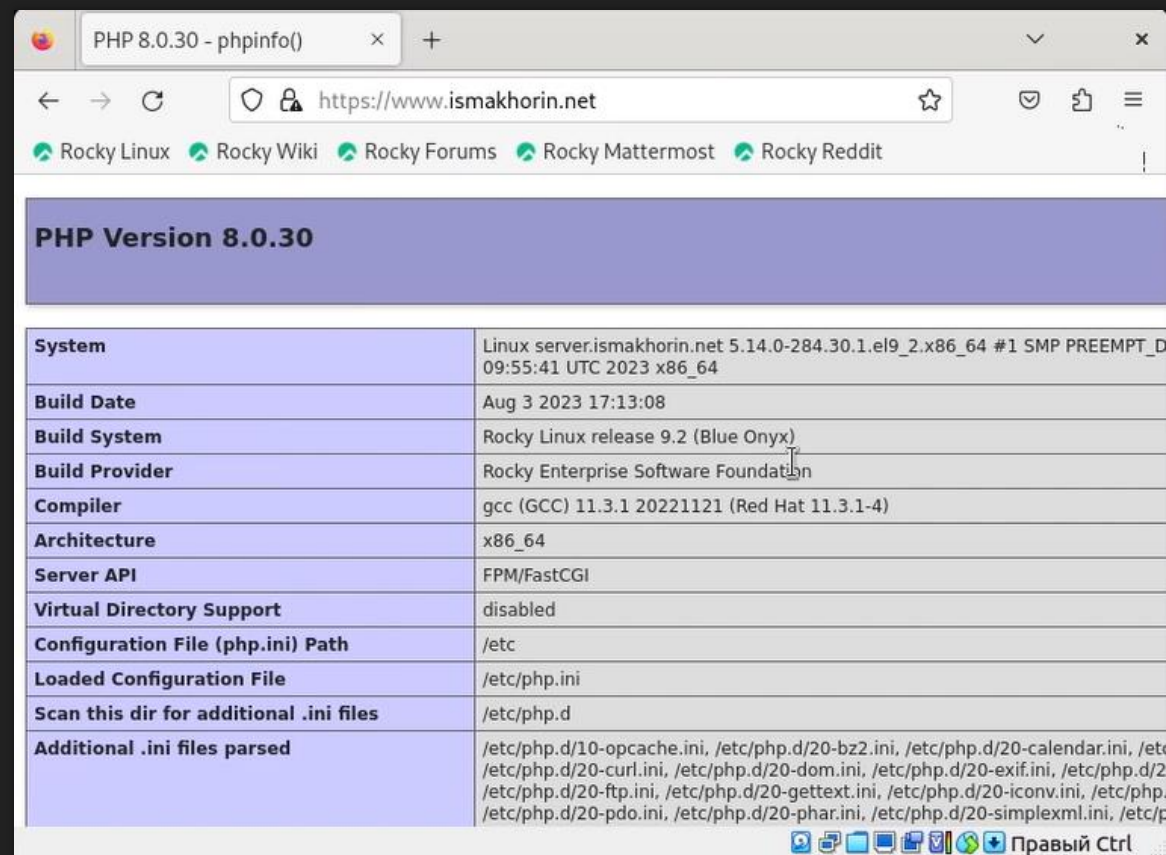
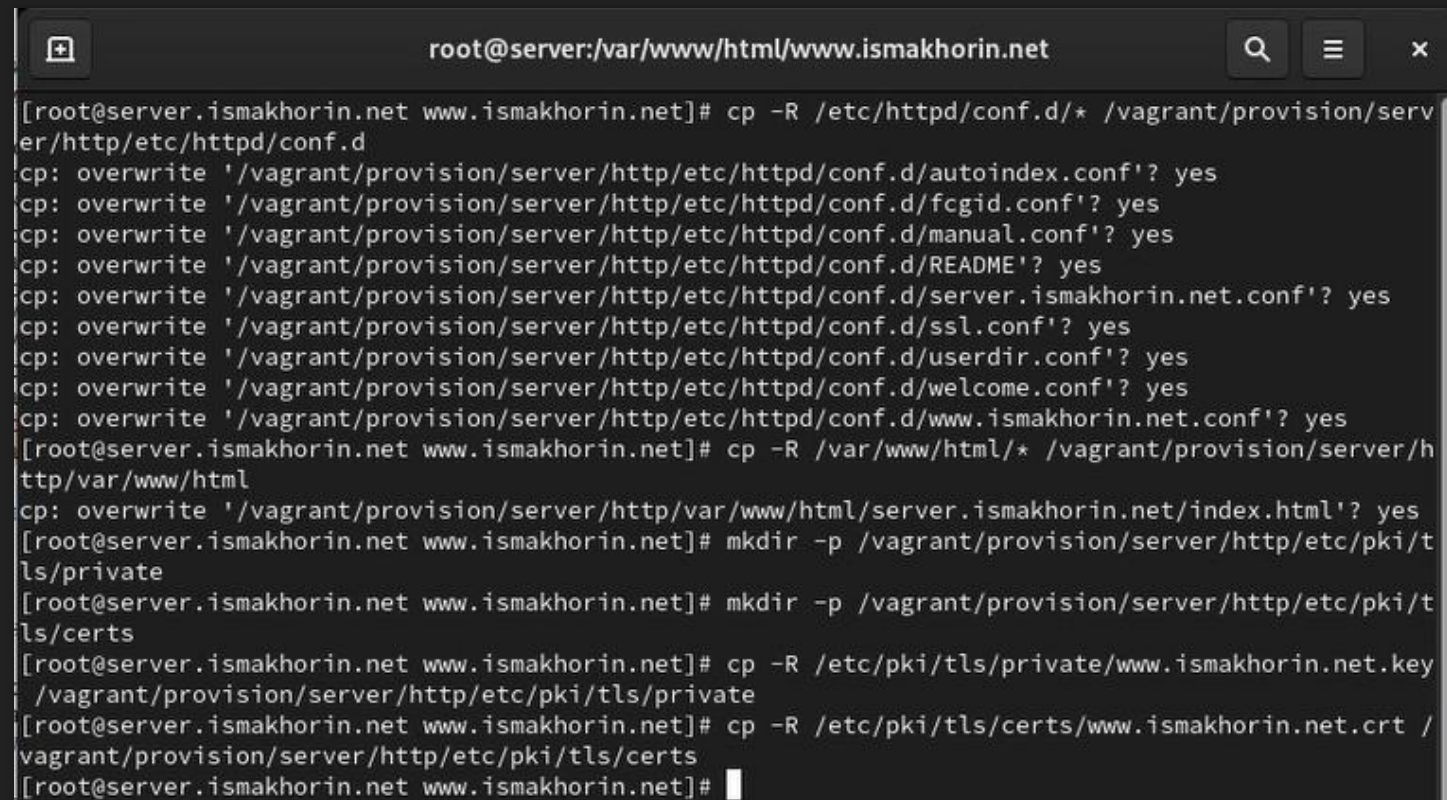


Рис. 2.4. Проверка вывода страницы с информацией об используемой на веб-сервере версии PHP.

# Внесение изменений в настройки внутреннего окружения виртуальной машины



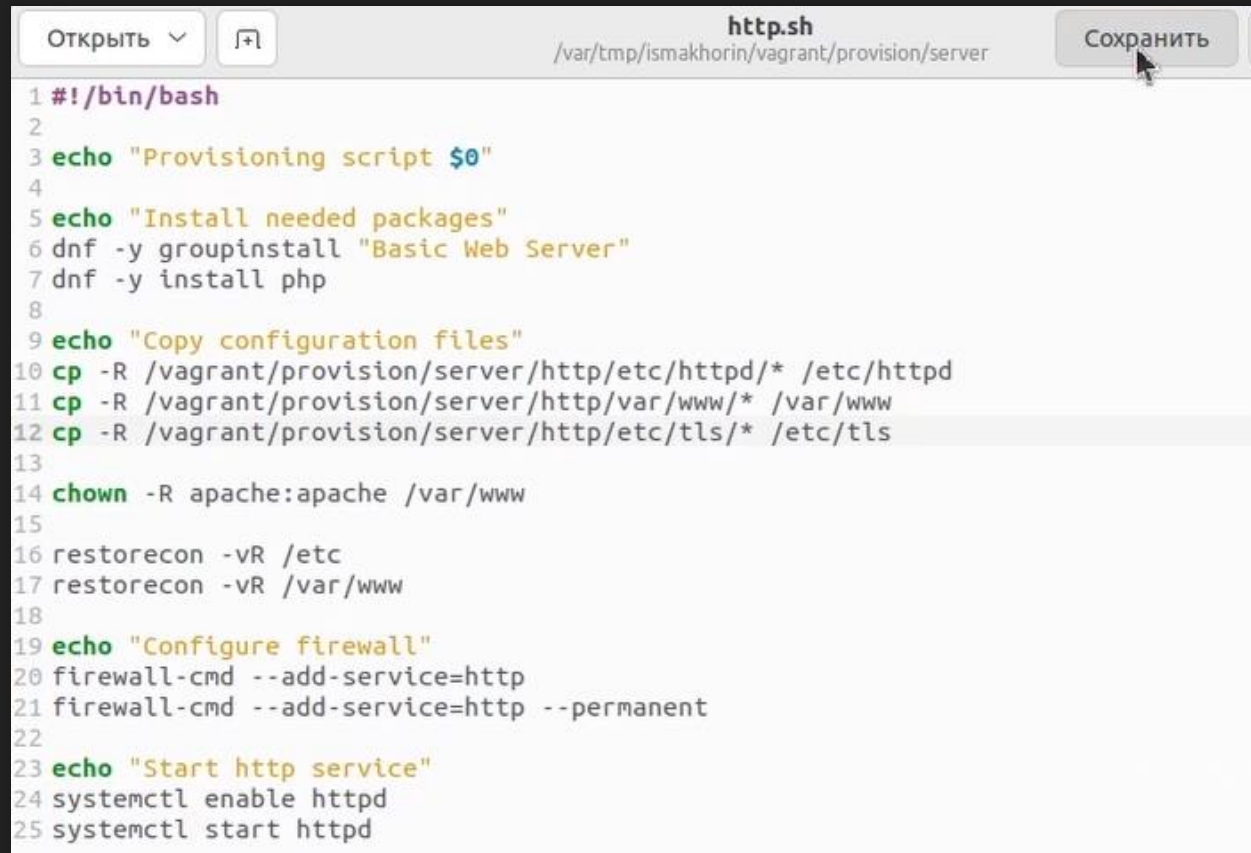
```
root@server:/var/www/html/www.ismakhorin.net

[root@server.ismakhorin.net www.ismakhorin.net]# cp -R /etc/httpd/conf.d/* /vagrant/provision/server/http/etc/httpd/conf.d
cp: overwrite '/vagrant/provision/server/http/etc/httpd/conf.d/autoindex.conf'? yes
cp: overwrite '/vagrant/provision/server/http/etc/httpd/conf.d/fcgid.conf'? yes
cp: overwrite '/vagrant/provision/server/http/etc/httpd/conf.d/manual.conf'? yes
cp: overwrite '/vagrant/provision/server/http/etc/httpd/conf.d/README'? yes
cp: overwrite '/vagrant/provision/server/http/etc/httpd/conf.d/server.ismakhorin.net.conf'? yes
cp: overwrite '/vagrant/provision/server/http/etc/httpd/conf.d/ssl.conf'? yes
cp: overwrite '/vagrant/provision/server/http/etc/httpd/conf.d/userdir.conf'? yes
cp: overwrite '/vagrant/provision/server/http/etc/httpd/conf.d/welcome.conf'? yes
cp: overwrite '/vagrant/provision/server/http/etc/httpd/conf.d/www.ismakhorin.net.conf'? yes
[root@server.ismakhorin.net www.ismakhorin.net]# cp -R /var/www/html/* /vagrant/provision/server/http/var/www/html
cp: overwrite '/vagrant/provision/server/http/var/www/html/server.ismakhorin.net/index.html'? yes
[root@server.ismakhorin.net www.ismakhorin.net]# mkdir -p /vagrant/provision/server/http/etc/pki/tls/private
[root@server.ismakhorin.net www.ismakhorin.net]# mkdir -p /vagrant/provision/server/http/etc/pki/tls/certs
[root@server.ismakhorin.net www.ismakhorin.net]# cp -R /etc/pki/tls/private/www.ismakhorin.net.key /vagrant/provision/server/http/etc/pki/tls/private
[root@server.ismakhorin.net www.ismakhorin.net]# cp -R /etc/pki/tls/certs/www.ismakhorin.net.crt /vagrant/provision/server/http/etc/pki/tls/certs
[root@server.ismakhorin.net www.ismakhorin.net]#
```

**Рис. 3.1.** Внесение изменений в настройки внутреннего окружения /vagrant/provision/server/http и копирование конфигурационных файлов в каталоги.



# Внесение изменений в настройки внутреннего окружения виртуальной машины



The screenshot shows a code editor window titled 'http.sh' with the file path '/var/tmp/ismakhorin/vagrant/provision/server'. The editor contains a shell script with 25 lines of code. The script is a provisioning script for a virtual machine, using 'dnf' for package installation, 'cp' for file copying, 'chown' for permissions, and 'systemctl' for service management. The script is currently open in a text editor with a 'Сохранить' (Save) button visible in the top right corner.

```
1 #!/bin/bash
2
3 echo "Provisioning script $0"
4
5 echo "Install needed packages"
6 dnf -y groupinstall "Basic Web Server"
7 dnf -y install php
8
9 echo "Copy configuration files"
10 cp -R /vagrant/provision/server/http/etc/httpd/* /etc/httpd
11 cp -R /vagrant/provision/server/http/var/www/* /var/www
12 cp -R /vagrant/provision/server/http/etc/tls/* /etc/tls
13
14 chown -R apache:apache /var/www
15
16 restorecon -vR /etc
17 restorecon -vR /var/www
18
19 echo "Configure firewall"
20 firewall-cmd --add-service=http
21 firewall-cmd --add-service=http --permanent
22
23 echo "Start http service"
24 systemctl enable httpd
25 systemctl start httpd
```

**Рис. 3.2.** Внесение изменений в скрипт `/vagrant/provision/server/http.sh`, добавив установку PHP и настройку межсетевого экрана, разрешающую работать с https.



# Вывод

- В ходе выполнения лабораторной работы были приобретены практические навыки по расширенному конфигурированию HTTP-сервера Apache в части безопасности и возможности использования PHP.

Спасибо за внимание!