

# Лабораторная работа №5

Расширенная настройка HTTP-сервера Apache

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# Цель работы

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Приобретение практических навыков по расширенному конфигурированию HTTP-сервера Apache в части безопасности и возможности использования PHP.





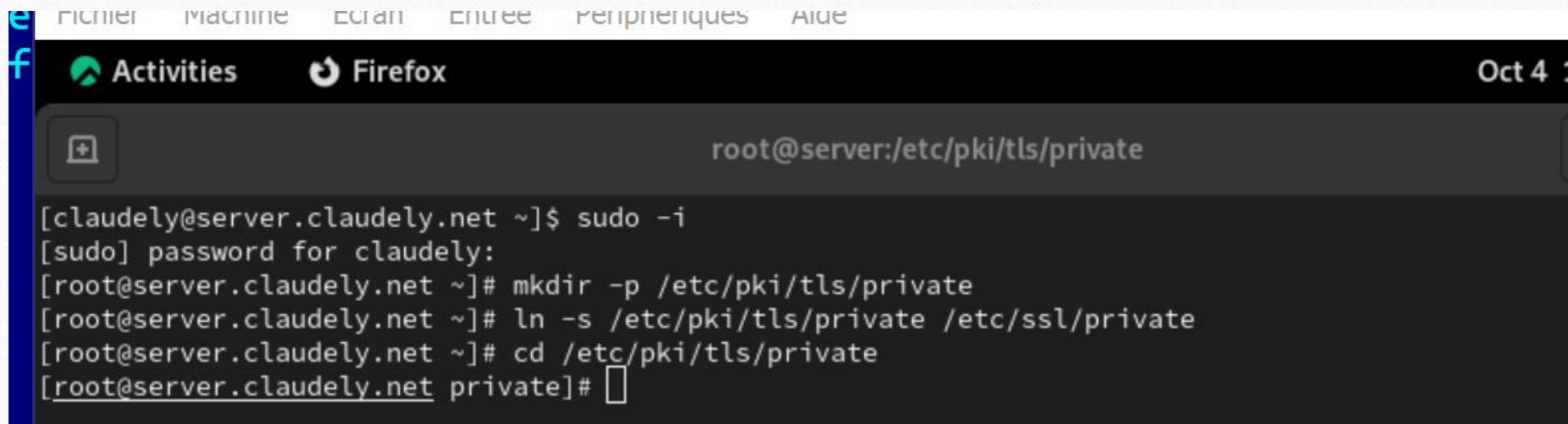
# Конфигурирование HTTP-сервера для работы через протокол HTTPS

```
Far Manager, version 3.0.6364.0 x64
Copyright © 1996–2000 Eugene Roshal, Copyright © 2000–2024 Far Group

C:\work\claudely\vagrant>vagrant up server
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: Resuming suspended VM...
==> server: Booting VM...
```

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

# Конфигурирование HTTP-сервера для работы через протокол HTTPS

A screenshot of a Linux desktop environment. At the top, there is a menu bar with items: 'Fichier', 'Machine', 'Ecran', 'Entree', 'Peripheriques', and 'Aide'. Below this is a panel with 'Activities' and 'Firefox' icons, and a date 'Oct 4'. The main part of the image is a terminal window titled 'root@server:/etc/pki/tls/private'. The terminal shows the following commands and output:

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

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

# Конфигурирование НТТР-сервера для работы через протокол НТТРС

[illegible]

Рис. 1.3. Генерация ключа.



# Конфигурирование HTTP-сервера для работы через протокол HTTPS

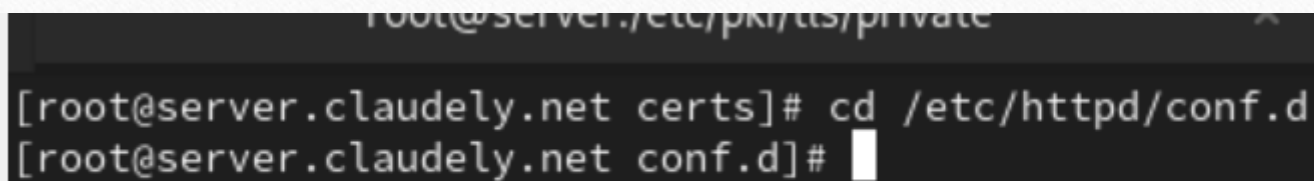
---

```
cert.pem certs ct_log_list.cnf openssl.cnf private  
[root@server.claudely.net ssl]#  
[root@server.claudely.net ssl]# cp /etc/ssl/private/www.claudely.net.crt /etc/ssl/certs  
cp: overwrite '/etc/ssl/certs/www.claudely.net.crt'? yes  
[root@server.claudely.net ssl]#
```

**Рис. 1.4.** Генерация сертификата.

# Конфигурирование HTTP-сервера для работы через протокол HTTPS

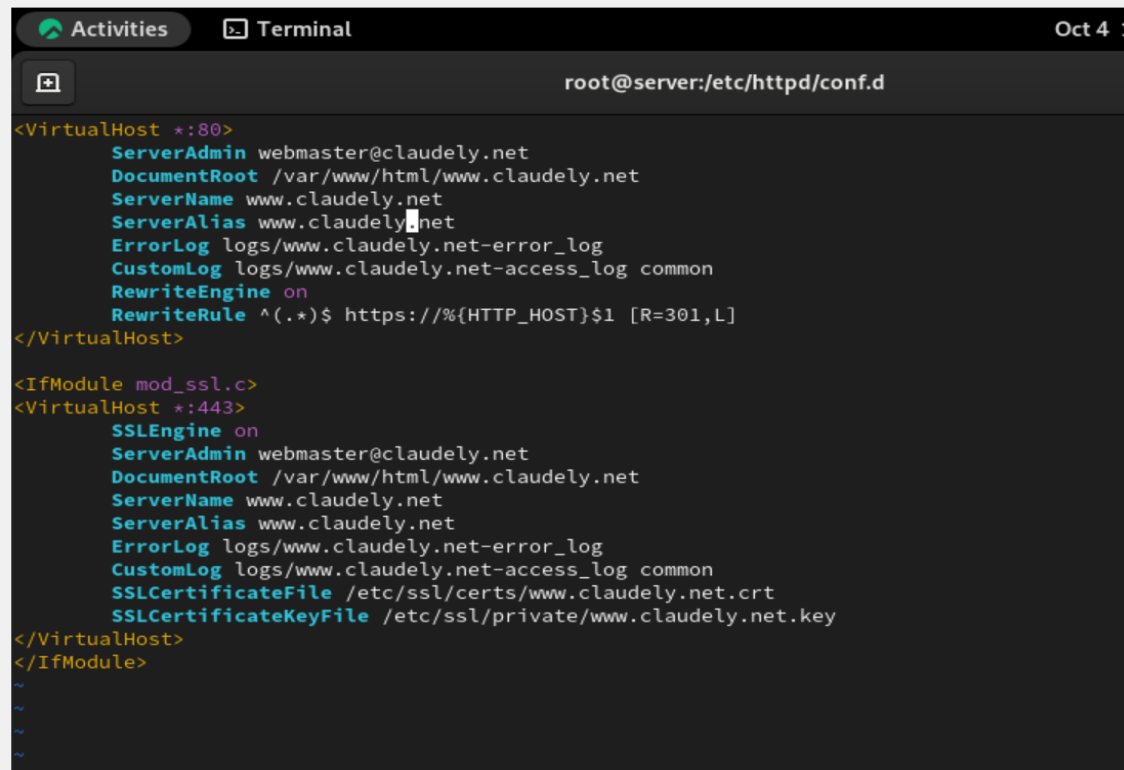
---

A terminal window screenshot showing a root user on a server. The prompt is [root@server.claudely.net certs]#. The user enters the command cd /etc/httpd/conf.d, and the prompt changes to [root@server.claudely.net conf.d]#. There is a white cursor at the end of the second prompt.

```
root@server.claudely.net certs]# cd /etc/httpd/conf.d  
[root@server.claudely.net conf.d]#
```

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

# Конфигурирование HTTP-сервера для работы через протокол HTTPS



The screenshot shows a terminal window with the title bar "Activities Terminal" and a date "Oct 4 1". The prompt is "root@server:/etc/httpd/conf.d". The terminal displays the configuration for a VirtualHost, which is being edited. The configuration includes settings for the VirtualHost \*:80 and a conditional block for the VirtualHost \*:443 (HTTPS). The VirtualHost \*:80 configuration includes ServerAdmin, DocumentRoot, ServerName, ServerAlias, ErrorLog, CustomLog, RewriteEngine, and RewriteRule. The VirtualHost \*:443 configuration includes SSLEngine, ServerAdmin, DocumentRoot, ServerName, ServerAlias, ErrorLog, CustomLog, SSLCertificateFile, and SSLCertificateKeyFile.

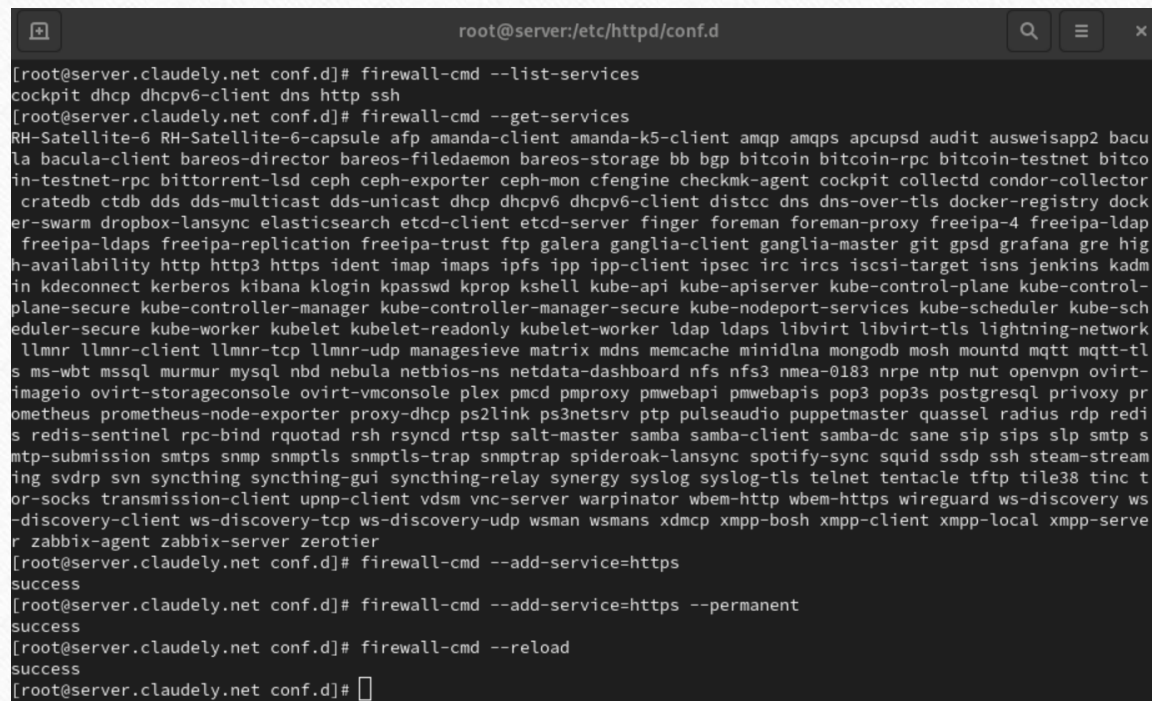
```
root@server:/etc/httpd/conf.d
<VirtualHost *:80>
    ServerAdmin webmaster@claudely.net
    DocumentRoot /var/www/html/www.claudely.net
    ServerName www.claudely.net
    ServerAlias www.claudely.net
    ErrorLog logs/www.claudely.net-error_log
    CustomLog logs/www.claudely.net-access_log common
    RewriteEngine on
    RewriteRule ^(.*)$ https://%{HTTP_HOST}$1 [R=301,L]
</VirtualHost>

<IfModule mod_ssl.c>
<VirtualHost *:443>
    SSLEngine on
    ServerAdmin webmaster@claudely.net
    DocumentRoot /var/www/html/www.claudely.net
    ServerName www.claudely.net
    ServerAlias www.claudely.net
    ErrorLog logs/www.claudely.net-error_log
    CustomLog logs/www.claudely.net-access_log common
    SSLCertificateFile /etc/ssl/certs/www.claudely.net.crt
    SSLCertificateKeyFile /etc/ssl/private/www.claudely.net.key
</VirtualHost>
</IfModule>
~
~
~
```

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



# Конфигурирование HTTP-сервера для работы через протокол HTTPS



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

[root@server.claudely.net conf.d]# firewall-cmd --list-services
cockpit dhcp dhcpv6-client dns http ssh
[root@server.claudely.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 bacu
la bacula-client bareos-director bareos-filedaemon bareos-storage bb bgp bitcoin bitcoin-rpc bitcoin-testnet bitco
in-testnet-rpc bittorrent-lsd ceph ceph-exporter ceph-mon cfengine checkmk-agent cockpit collectd condor-collector
cratedb ctdb dds dds-multicast dds-unicast dhcp dhcpv6 dhcpv6-client distcc dns dns-over-tls docker-registry dock
er-swarm dropbox-lansync elasticsearch etcd-client etcd-server finger foreman foreman-proxy freeipa-4 freeipa-ldap
freeipa-ldaps freeipa-replication freeipa-trust ftp galera ganglia-client ganglia-master git gpsd grafana gre hig
h-availability http http3 https ident imap imaps ipfs ipp ipp-client ipsec irc ircs iscsi-target isns jenkins kadm
in 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 kube-sch
eduler-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 mqtt-tl
s ms-wbt mssql murmur mysql nbd nebula netbios-ns netdata-dashboard nfs nfs3 nmea-0183 nrpe ntp nut openvpn ovirt-
imageio ovirt-storageconsole ovirt-vmconsole plex pmcd pmproxy pmwebapi pmwebapis pop3 pop3s postgresql privoxy pr
ometheus prometheus-node-exporter proxy-dhcp ps2link ps3netsrv ptp pulseaudio puppetmaster quassel radius rdp redi
s redis-sentinel rpc-bind rquotad rsh rsyncd rtsp salt-master samba samba-client samba-dc sane sip sips slp smtp s
mtp-submission smtps snmp snmptls snmptls-trap snmptrap spideroak-lansync spotify-sync squid ssdp ssh steam-stream
ing svdrp svn syncthing syncthing-gui syncthing-relay synergy syslog syslog-tls telnet tentacle tftp tile38 tinc t
or-socks transmission-client upnp-client vdsim vnc-server warpinator 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-serve
r zabbix-agent zabbix-server zerotier
[root@server.claudely.net conf.d]# firewall-cmd --add-service=https
success
[root@server.claudely.net conf.d]# firewall-cmd --add-service=https --permanent
success
[root@server.claudely.net conf.d]# firewall-cmd --reload
success
[root@server.claudely.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

---

```
[root@server.claudely.net conf.d]#  
[root@server.claudely.net conf.d]# systemctl restart httpd  
[root@server.claudely.net conf.d]#
```

**Рис. 1.8.** Перезапуск веб-сервера.



# Конфигурирование HTTP-сервера для работы через протокол HTTPS

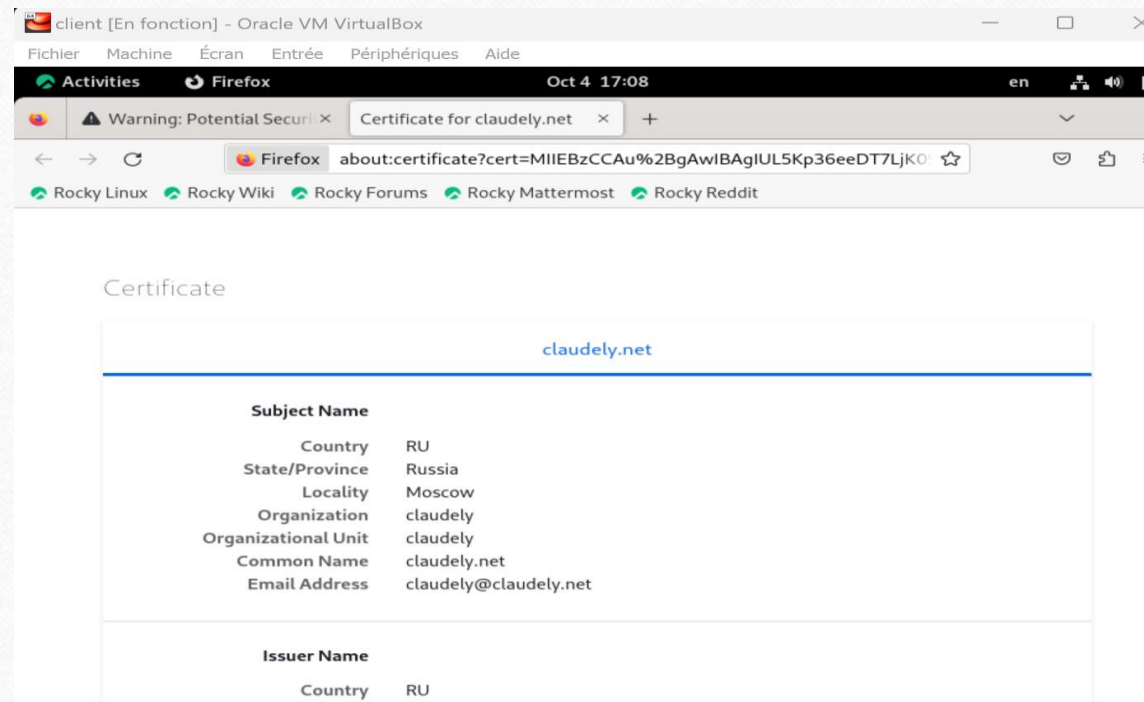


Рис. 1.9. Открытие веб-сервера [www.claudely.net](http://www.claudely.net) и автоматическое переключение на работу по протоколу HTTPS.

# Конфигурирование HTTP-сервера для работы с PHP

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

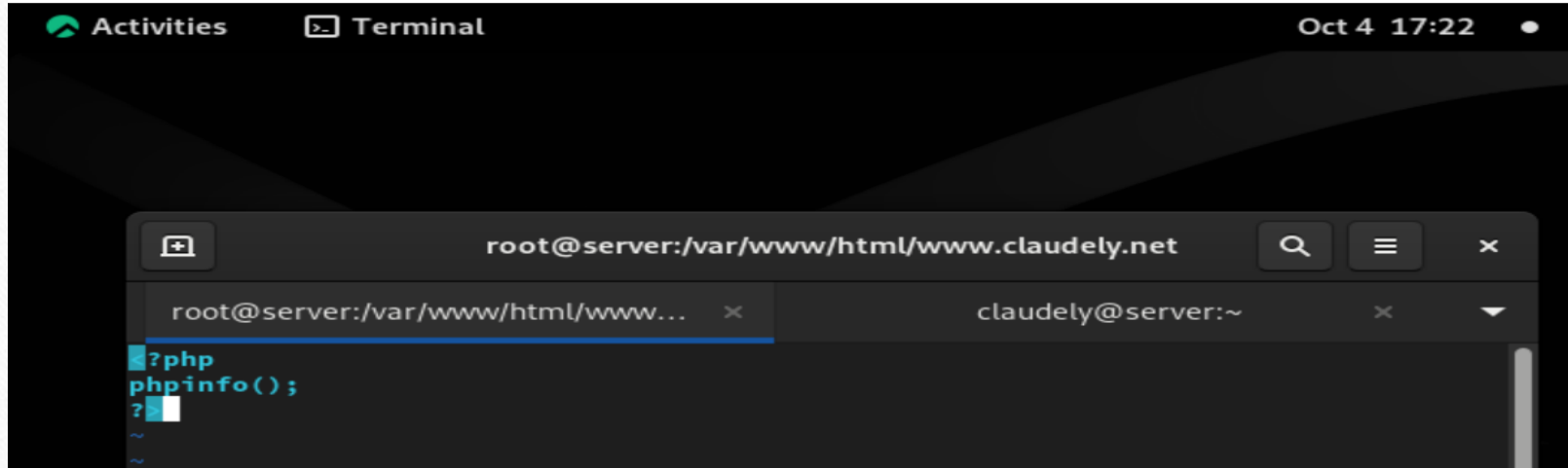
[root@server.claudely.net conf.d]# dnf -y install php
Last metadata expiration check: 0:09:06 ago on Fri 04 Oct 2024 05:00:46 PM UTC.
Dependencies resolved.
=====
Package                                Architecture      Version           Repository        Size
=====
Installing:
php                                    x86_64            8.0.30-1.el9_2    appstream         7.7 k
Installing dependencies:
nginxfilesystem                       noarch            1:1.20.1-16.el9_4.1 appstream         8.1 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-1.20.1-16.el9_4.1.noarch.rpm    4.2 kB/s | 8.1 kB    00:01
(2/9): php-pdo-8.0.30-1.el9_2.x86_64.rpm              42 kB/s | 81 kB     00:01
(3/9): php-xml-8.0.30-1.el9_2.x86_64.rpm              67 kB/s | 131 kB    00:01
(4/9): php-mbstring-8.0.30-1.el9_2.x86_64.rpm         2.9 MB/s | 468 kB   00:00
(5/9): php-opcache-8.0.30-1.el9_2.x86_64.rpm          1.9 MB/s | 509 kB   00:00
```

Рис. 2.1. Установка пакетов для работы с PHP.



# Конфигурирование HTTP-сервера для работы с PHP



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

# Конфигурирование HTTP-сервера для работы с PHP

```
[root@server.claudely.net www.claudely.net]# vim index.html  
[root@server.claudely.net www.claudely.net]# chown -R apache:apache /var/www  
[root@server.claudely.net www.claudely.net]#  
[root@server.claudely.net www.claudely.net]# restorecon -vR /etc  
[root@server.claudely.net www.claudely.net]# restorecon -vR /var/www  
[root@server.claudely.net www.claudely.net]# systemctl restart httpd  
[root@server.claudely.net www.claudely.net]#
```

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



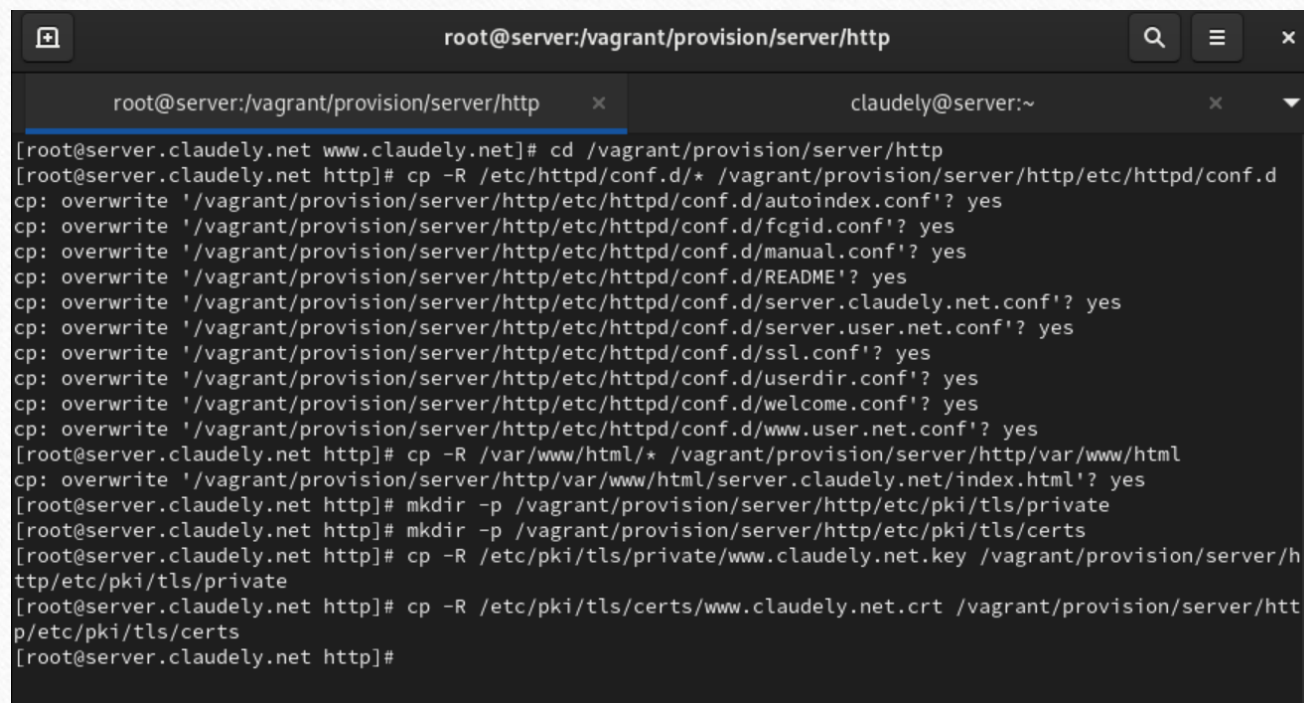
# Конфигурирование HTTP-сервера для работы с PHP

The screenshot shows a web browser window titled "client [En fonction] - Oracle VM VirtualBox". The browser is Firefox, and the address bar shows "https://www.claudely.net". The page displays "PHP Version 8.0.30" with the PHP logo. Below the header is a table with system and configuration details.

System	Linux server.claudely.net 5.14.0-427.37.1.el9_4.x86_64 #1 SMP PREEMPT_DYNAMIC Wed Sep 25 11:51:41 UTC 2024 x86_64
Build Date	Aug 3 2023 17:13:08
Build System	Rocky Linux release 9.2 (Blue Onyx)
Build Provider	Rocky Enterprise Software Foundation
Compiler	gcc (GCC) 11.3.1 20221121 (Red Hat 11.3.1-4)
Architecture	x86_64
Server API	FPM/FastCGI
Virtual Directory Support	disabled
Configuration File (php.ini) Path	/etc
Loaded Configuration File	/etc/php.ini
Scan this dir for additional .ini files	/etc/php.d
Additional .ini files parsed	/etc/php.d/10-opcache.ini, /etc/php.d/20-bz2.ini, /etc/php.d/20-calendar.ini, /etc/php.d/20-ctype.ini, /etc/php.d/20-curl.ini, /etc/php.d/20-dom.ini, /etc/php.d/20-exif.ini, /etc/php.d/20-fileinfo.ini, /etc/php.d/20-ftp.ini, /etc/php.d/20-gettext.ini, /etc/php.d/20-iconv.ini, /etc/php.d/20-mbstring.ini, /etc/php.d/20-pdo.ini, /etc/php.d/20-phar.ini, /etc/php.d/20-simplexml.ini, /etc/php.d/20-sockets.ini, /etc/php.d/20-sqlite3.ini, /etc/php.d/20-tokenizer.ini, /etc/php.d/20-xml.ini, /etc/php.d/20-xmlwriter.ini, /etc/php.d/20-xsl.ini, /etc/php.d/30-pdo_sqlite.ini, /etc/php.d/30-xmlreader.ini
PHP API	20200930
PHP Extension	20200930

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

# Внесение изменений в настройки внутреннего окружения виртуальной машины

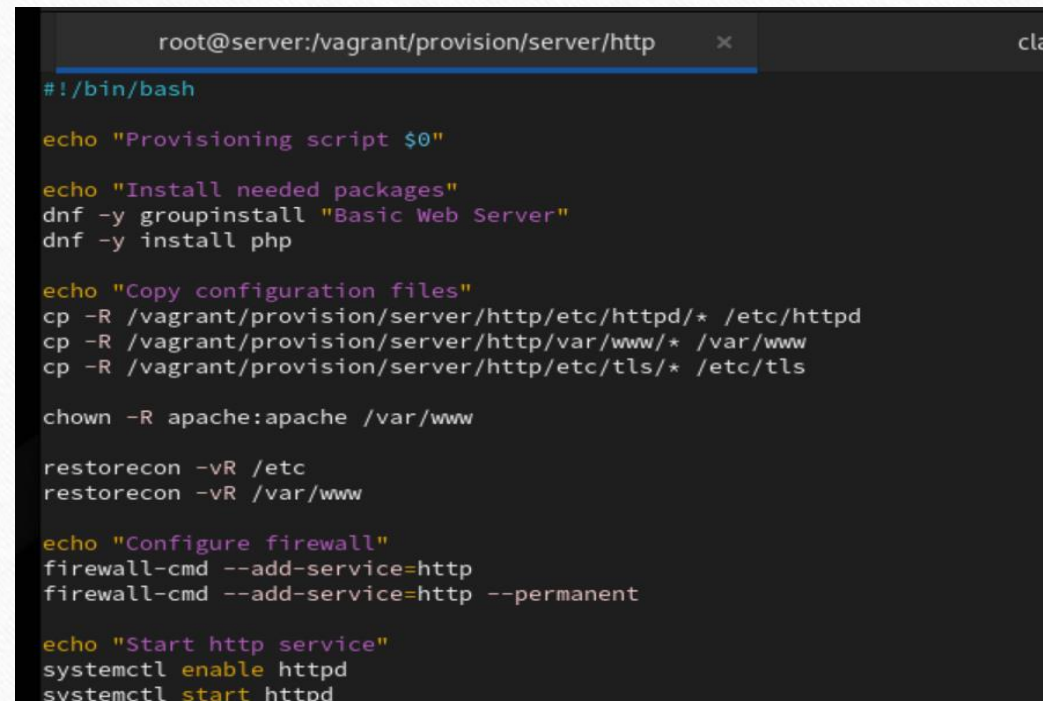


```
root@server:/vagrant/provision/server/http
root@server:/vagrant/provision/server/http x claudely@server:~
[claudely@server.~]$ cd /vagrant/provision/server/http
[claudely@server.~ http]$ cp -R /etc/httpd/conf.d/* /vagrant/provision/server/http/etc/httpd/conf.d
cp: overwrite '/vagrant/provision/server/http/etc/httpd/conf.d/autoindex.conf'? 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.claudely.net.conf'? yes
cp: overwrite '/vagrant/provision/server/http/etc/httpd/conf.d/server.user.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.user.net.conf'? yes
[claudely@server.~ http]$ cp -R /var/www/html/* /vagrant/provision/server/http/var/www/html
cp: overwrite '/vagrant/provision/server/http/var/www/html/server.claudely.net/index.html'? yes
[claudely@server.~ http]$ mkdir -p /vagrant/provision/server/http/etc/pki/tls/private
[claudely@server.~ http]$ mkdir -p /vagrant/provision/server/http/etc/pki/tls/certs
[claudely@server.~ http]$ cp -R /etc/pki/tls/private/www.claudely.net.key /vagrant/provision/server/h
http/etc/pki/tls/private
[claudely@server.~ http]$ cp -R /etc/pki/tls/certs/www.claudely.net.crt /vagrant/provision/server/htt
p/etc/pki/tls/certs
[claudely@server.~ http]$
```

**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



```
root@server:/vagrant/provision/server/http x clau
#!/bin/bash

echo "Provisioning script $0"

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

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

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=https --permanent

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

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

## *Вывод*

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

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*Спасибо за внимание!*