

Лабораторная работа №5

Расширенная настройка HTTP-сервера Apache

Демидова Е. А.

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Российский университет дружбы народов, Москва, Россия

Вводная часть

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

1. Сгенерируйте криптографический ключ и самоподписанный сертификат безопасности для возможности перехода веб-сервера от работы через протокол HTTP к работе через протокол HTTPS.
2. Настройте веб-сервер для работы с PHP.
3. Напишите (или скорректируйте) скрипт для Vagrant, фиксирующий действия по расширенной настройке HTTP-сервера во внутреннем окружении виртуальной машины server.

Выполнение лабораторной работы

Конфигурирование HTTP-сервера для работы через протокол HTTPS

[illegible]

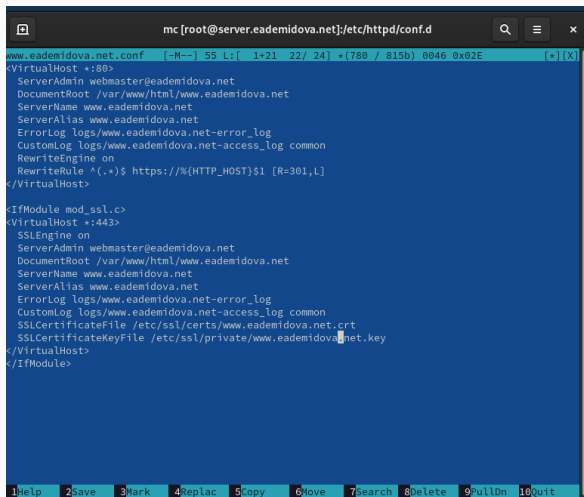
Рис. 1: Создание каталога и генерация ключа и сертификата

Конфигурирование HTTP-сервера для работы через протокол HTTPS

```
-----  
You are about to be asked to enter information that will be incorporated  
into your certificate request.  
What you are about to enter is what is called a Distinguished Name or a DN.  
There are quite a few fields but you can leave some blank  
For some fields there will be a default value,  
If you enter '.', the field will be left blank.  
-----  
Country Name (2 letter code) [XX]:RU  
State or Province Name (full name) []:Russia  
Locality Name (eg, city) [Default City]:Moscow  
Organization Name (eg, company) [Default Company Ltd]:eademidova  
Organizational Unit Name (eg, section) []:eademidova  
Common Name (eg, your name or your server's hostname) []:eademidova.net  
Email Address []:eademidova@eademidova.net  
[root@server.eademidova.net private]#
```

Рис. 2: Заполнение сертификата

Конфигурирование HTTP-сервера для работы через протокол HTTPS



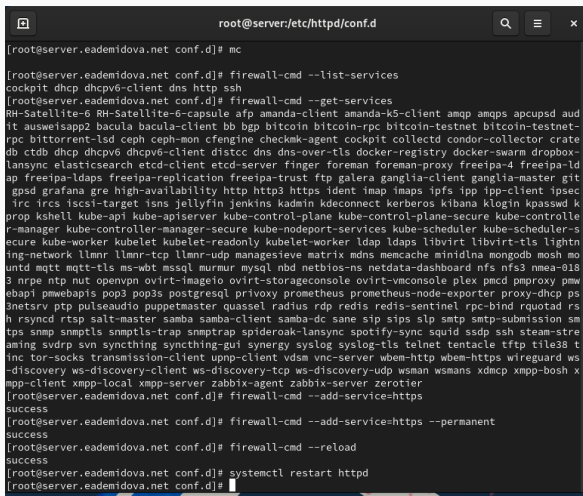
```
mc [root@server.eademidova.net]:/etc/httpd/conf.d
www.eademidova.net.conf  [-M--] 55 L: [ 1+21 22/ 24] *(780 / 815b) 0046 0x02E  [*][X]
<VirtualHost *:80>
  ServerAdmin webmaster@eademidova.net
  DocumentRoot /var/www/html/www.eademidova.net
  ServerName www.eademidova.net
  ServerAlias www.eademidova.net
  ErrorLog logs/www.eademidova.net-error_log
  CustomLog logs/www.eademidova.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@eademidova.net
  DocumentRoot /var/www/html/www.eademidova.net
  ServerName www.eademidova.net
  ServerAlias www.eademidova.net
  ErrorLog logs/www.eademidova.net-error_log
  CustomLog logs/www.eademidova.net-access_log common
  SSLCertificateFile /etc/ssl/certs/www.eademidova.net.crt
  SSLCertificateKeyFile /etc/ssl/private/www.eademidova.net.key
</VirtualHost>
</IfModule>

1Help 2Save 3Mark 4Replac 5Copy 6Move 7Search 8Delete 9PullDn 10Quit
```

Рис. 3: Изменение конфигурационного файла www.eademidova.net.conf

Конфигурирование HTTP-сервера для работы через протокол HTTPS



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

[root@server.eademidova.net conf.d]# mc

[root@server.eademidova.net conf.d]# firewall-cmd --list-services
cockpit dhcp dhcpv6-client dns http ssh
[root@server.eademidova.net conf.d]# firewall-cmd --get-services
RH-Satellite-6 RH-Satellite-6-capsule afp amanda-client amanda-k5-client amqp amqps apcupsd aud
it ausweisapp2 bacula bacula-client bb bgp bitcoin bitcoin-rpc bitcoin-testnet bitcoin-testnet-
rpc bittorrent-lsd ceph ceph-mon cfengine checkmk-agent cockpit collectd condor-collector crate
db ctdb dhcp dhcpv6 dhcpv6-client distcc dns dns-over-tls docker-registry docker-swarm dropbox-
lansync elasticsearch etcd-client etcd-server finger foreman foreman-proxy freeipa-4 freeipa-ld
ap freeipa-ldaps 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-target isns jellyfin jenkins kadmin kdeconnect kerberos kibana klogin kpasswd k
prop kshell kube-api kube-apiserver kube-control-plane kube-control-plane-secure kube-controlle
r-manager kube-controller-manager-secure kube-nodeport-services kube-scheduler kube-scheduler-s
ecure kube-worker kubelet kubelet-readonly kubelet-worker ldap ldaps libvirt libvirt-tls lightn
ing-network llmnr llmnr-tcp llmnr-udp managesieve matrix mdns memcache minidlna mongodb mosh mo
untdd mqtt mqtt-tls ms-wbt mssql murmur mysql nbd netbios-ns netdata-dashboard nfs nfs3 nmea-018
3 nrpe ntp nut openvpn ovirt-imageio ovirt-storageconsole ovirt-vmconsole plex pmcd pmproxy pmw
ebapi pmwebapis pop3 pop3s postgresql privoxy prometheus prometheus-node-exporter proxy-dhcp ps
3netshr ptp pulseaudio puppetmaster quassel radius rdp redis redis-sentinel rpc-bind rquoad rs
h rsyncd rtsp salt-master samba samba-client samba-dc sane sip sips slp smtp smtp-submission sm
tps snmp snmptls snmptls-trap snmptrap spideroak-lansync spotify-sync squid sssd ssh steam-stre
aming svdrp svn syncthing syncthing-gui synergy syslog syslog-tls telnet tentacle tftp tile38 t
inc tor-socks transmission-client upnp-client vdsml vnc-server wbem-http wbem-https wireguard ws
-discovery ws-discovery-client ws-discovery-tcp ws-discovery-udp wsman wsmans xdmcp xmpp-bosh x
mpp-client xmpp-local xmpp-server zabbix-agent zabbix-server zerotier
[root@server.eademidova.net conf.d]# firewall-cmd --add-service=https
success
[root@server.eademidova.net conf.d]# firewall-cmd --add-service=https --permanent
success
[root@server.eademidova.net conf.d]# firewall-cmd --reload
success
[root@server.eademidova.net conf.d]# systemctl restart httpd
[root@server.eademidova.net conf.d]#
```

Рис. 4: Всенесение в нстройки межсетевого экрана и перезапуск веб-сервера

Конфигурирование HTTP-сервера для работы через протокол HTTPS

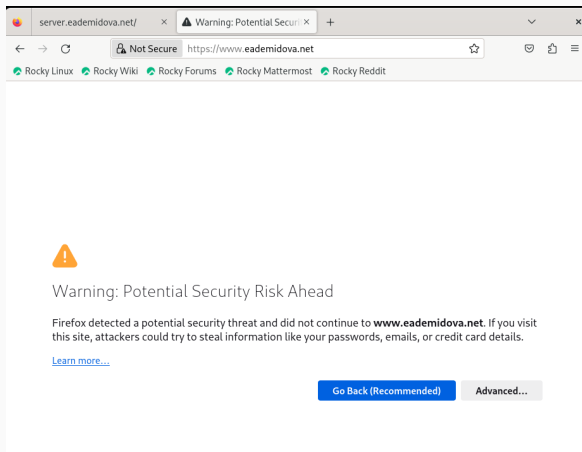


Рис. 5: Сообщение о незащищенности соединения

Конфигурирование HTTP-сервера для работы через протокол HTTPS

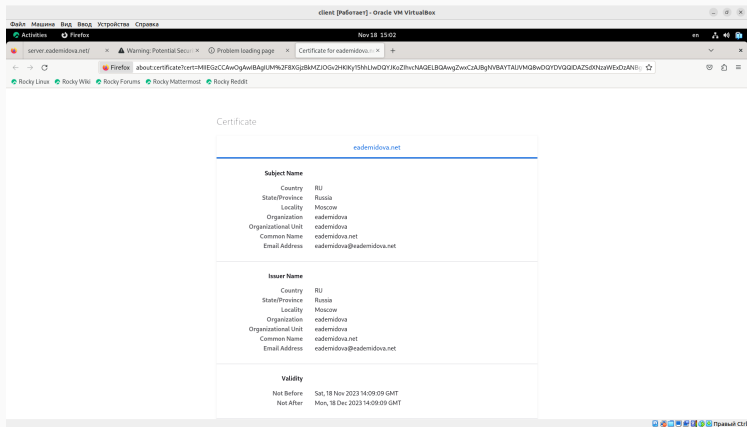


Рис. 6: Просмотр содержания сертификата

Установим пакеты для работы с PHP, затем в каталоге `/var/www/html/www.eademidova.net` заменим файл `index.html` на `index.php` следующего содержания:

```
<?php
phpinfo();
?>
```

Конфигурирование HTTP-сервера для работы с PHP



```
server [Работает] - Oracle VM VirtualBox
Nov 18 15:12
root@server:/var/www/html/www.xademidova.net

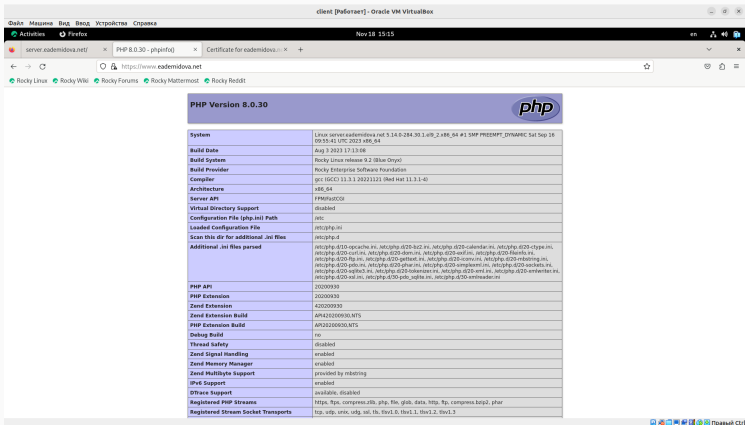
3.0 MB/s | 3.1 MB 00:00
Total 3.0 MB/s | 6.5 MB 00:01
Running transaction check
Transaction check succeeded.
Running transaction test
Transaction test succeeded.
Running transaction
Preparing : php-common-8.0.30-1.el9_2.x86_64 1/1
Installing : php-common-8.0.30-1.el9_2.x86_64 2/0
Installing : php-xsl-8.0.30-1.el9_2.x86_64 2/0
Installing : php-pdo-8.0.30-1.el9_2.x86_64 3/0
Installing : php-apache-8.0.30-1.el9_2.x86_64 4/0
Installing : php-mbstring-8.0.30-1.el9_2.x86_64 5/0
Installing : php-cli-8.0.30-1.el9_2.x86_64 6/0
Running scriptlet: nghttp-filesystem-1:1.20.1-14.el9_2.1.noarch 7/0
Installing : nghttp-filesystem-1:1.20.1-14.el9_2.1.noarch 7/0
Installing : php-fpm-8.0.30-1.el9_2.x86_64 8/0
Running scriptlet: php-fpm-8.0.30-1.el9_2.x86_64 8/0
Installing : php-8.0.30-1.el9_2.x86_64 9/0
Running scriptlet: php-8.0.30-1.el9_2.x86_64 9/0
Verifying : nghttp-filesystem-1:1.20.1-14.el9_2.1.noarch 1/0
Verifying : php-xsl-8.0.30-1.el9_2.x86_64 2/0
Verifying : php-pdo-8.0.30-1.el9_2.x86_64 3/0
Verifying : php-apache-8.0.30-1.el9_2.x86_64 4/0
Verifying : php-mbstring-8.0.30-1.el9_2.x86_64 5/0
Verifying : php-fpm-8.0.30-1.el9_2.x86_64 6/0
Verifying : php-cli-8.0.30-1.el9_2.x86_64 7/0
Verifying : php-8.0.30-1.el9_2.x86_64 8/0
Verifying : php-8.0.30-1.el9_2.x86_64 9/0

Installed:
  nghttp-filesystem-1:1.20.1-14.el9_2.1.noarch      php-8.0.30-1.el9_2.x86_64
  php-cli-8.0.30-1.el9_2.x86_64                    php-common-8.0.30-1.el9_2.x86_64
  php-fpm-8.0.30-1.el9_2.x86_64                    php-mbstring-8.0.30-1.el9_2.x86_64
  php-apache-8.0.30-1.el9_2.x86_64                 php-pdo-8.0.30-1.el9_2.x86_64
  php-xsl-8.0.30-1.el9_2.x86_64

Complete!
[root@server xademidova.net conf.d]# cd /var/www/html/
[root@server xademidova.net html]# cd www.xademidova.net/
[root@server xademidova.net www.xademidova.net]# ls
[root@server xademidova.net www.xademidova.net]# mv index.html index.php
[root@server xademidova.net www.xademidova.net]# ls
[root@server xademidova.net www.xademidova.net]# systemctl restart httpd
[root@server xademidova.net www.xademidova.net]#
```

Рис. 7: Конфигурирование HTTP-сервера для работы с PHP

Конфигурирование HTTP-сервера для работы с PHP




The screenshot shows a web browser window with the address bar displaying `https://www.eadמידova.net`. The page content is the PHP Version 8.0.30 status page, which includes a table of system and configuration details.

PHP Version 8.0.30	
System	Linux server.eadמידova.net 5.14.0-284.30.1.el9_2.x86_64 #1 SMP PREEMPT_DYNAMIC Sat Sep 16 09:55:41 UTC 2023 x86_64
Build Date	Aug 3 2023 17:13:06
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	FFMpegCGI
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-bc2.ini, etc/php.d/20-calendar.ini, etc/php.d/20-ctype.ini, etc/php.d/20-curl.ini, etc/php.d/20-dbm.ini, etc/php.d/20-embed.ini, etc/php.d/20-headers.ini, etc/php.d/20-http.ini, etc/php.d/20-gettext.ini, etc/php.d/20-iconv.ini, etc/php.d/20-imagick.ini, etc/php.d/20-pdo.ini, etc/php.d/20-phar.ini, etc/php.d/20-sockets.ini, etc/php.d/20-sockets.ini, etc/php.d/20-sqlite.ini, etc/php.d/20-tokenizer.ini, etc/php.d/20-xml.ini, etc/php.d/20-xmlreader.ini, etc/php.d/20-xmlwriter.ini
PHP API	20200930
PHP Extension	20200930
Zend Extension	420200930
Zend Extension Build	AP420200930.NTS
PHP Extension Build	AP420200930.NTS
Debug Build	no
Thread Safety	disabled
Zend Signal Handling	enabled
Zend Memory Manager	enabled
Zend Multibyte Support	provided by mbstring
IPv6 Support	enabled
ODBC Support	available, disabled
Registered PHP Streams	ftp, ftps, compress.zlib, php, file, glob, data, http, ftp, compress.bzip2, phar
Registered Stream Socket Transports	tcp, udp, unix, udg, ssl, tls, tls1.0, tls1.1, tls1.2, tls1.3

Рис. 8: Проверка работы сервера с PHP

Внесение изменений в настройки внутреннего окружения виртуальной машины



```
server [Ru60raet] - Oracle VM VirtualBox
Nov 18 15:19
root@server:/var/www/html/www.xademidova.net

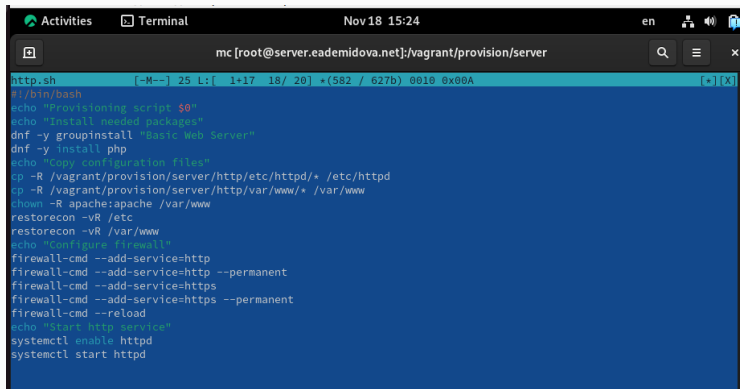
Verifying : php-mb-8.0.30-1.el9_2.x86_64 2/9
Verifying : php-pdo-8.0.30-1.el9_2.x86_64 3/9
Verifying : php-opcache-8.0.30-1.el9_2.x86_64 4/9
Verifying : php-mbstring-8.0.30-1.el9_2.x86_64 5/9
Verifying : php-fpm-8.0.30-1.el9_2.x86_64 6/9
Verifying : php-common-8.0.30-1.el9_2.x86_64 7/9
Verifying : php-cli-8.0.30-1.el9_2.x86_64 8/9
Verifying : php-8.0.30-1.el9_2.x86_64 9/9

Installed:
  nginxfilesystem-1:1.20.1-14.el9_2.1.noarch      php-8.0.30-1.el9_2.x86_64
  php-cli-8.0.30-1.el9_2.x86_64                  php-common-8.0.30-1.el9_2.x86_64
  php-fpm-8.0.30-1.el9_2.x86_64                  php-mbstring-8.0.30-1.el9_2.x86_64
  php-opcache-8.0.30-1.el9_2.x86_64              php-pdo-8.0.30-1.el9_2.x86_64
  php-mb-8.0.30-1.el9_2.x86_64

Complete!
[root@server.xademidova.net conf.d]# cd /var/www/html/
[root@server.xademidova.net html]# cd www.xademidova.net/
[root@server.xademidova.net www.xademidova.net]# mc
[root@server.xademidova.net www.xademidova.net]# mv index.html index.php
[root@server.xademidova.net www.xademidova.net]# mc
[root@server.xademidova.net www.xademidova.net]# chown -R apache:apache /var/www
[root@server.xademidova.net www.xademidova.net]# restorecon -vR /etc
Relabeled /etc/psacct/scripts/rpccatd from unconfined_uobject_r/net_conf_t:tab
[root@server.xademidova.net www.xademidova.net]# restorecon -vR /var/www
[root@server.xademidova.net www.xademidova.net]# systemctl restart httpd
[root@server.xademidova.net www.xademidova.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'? y
cp: overwrite '/vagrant/provision/server/http/etc/httpd/conf.d/fgid.conf'? y
cp: overwrite '/vagrant/provision/server/http/etc/httpd/conf.d/manual.conf'? y
cp: overwrite '/vagrant/provision/server/http/etc/httpd/conf.d/README'? y
cp: overwrite '/vagrant/provision/server/http/etc/httpd/conf.d/server.xademidova.net.conf'? y
cp: overwrite '/vagrant/provision/server/http/etc/httpd/conf.d/ssl.conf'? y
cp: overwrite '/vagrant/provision/server/http/etc/httpd/conf.d/userdir.conf'? y
cp: overwrite '/vagrant/provision/server/http/etc/httpd/conf.d/welcome.conf'? y
cp: overwrite '/vagrant/provision/server/http/etc/httpd/conf.d/www.xademidova.net.conf'? y
[root@server.xademidova.net www.xademidova.net]# y
bash: y: command not found
[root@server.xademidova.net www.xademidova.net]# cp -R /var/www/html/* /vagrant/provision/server/http/var/www/html
cp: target '/vagrant/provision/server/http/var/www/html' is not a directory
[root@server.xademidova.net www.xademidova.net]# cp -R /var/www/html/* /vagrant/provision/server/http/var/www/html
cp: overwrite '/vagrant/provision/server/http/var/www/html/server.xademidova.net/index.html'? y
[root@server.xademidova.net www.xademidova.net]# mkdir -p /vagrant/provision/server/http/etc/pki/tls/private
[root@server.xademidova.net www.xademidova.net]# mkdir -p /vagrant/provision/server/http/etc/pki/tls/certs
[root@server.xademidova.net www.xademidova.net]# cp -R /etc/pki/tls/private/www.user.net.key /vagrant/provision/server/http/etc/pki/tls/private
cp: cannot stat '/etc/pki/tls/private/www.user.net.key': No such file or directory
[root@server.xademidova.net www.xademidova.net]# cp -R /etc/pki/tls/private/www.xademidova.net.key /vagrant/provision/server/http/etc/pki/tls/private
[root@server.xademidova.net www.xademidova.net]# cp -R /etc/pki/tls/certs/www.xademidova.net.crt /vagrant/provision/server/http/etc/pki/tls/certs
[root@server.xademidova.net www.xademidova.net]#
```

Рис. 9: Создание окружения для внесения изменений в настройки окружающей среды

Внесение изменений в настройки внутреннего окружения виртуальной машины



The image shows a terminal window titled "Terminal" with the date and time "Nov 18 15:24". The terminal is running a script named "http.sh" in a directory "mc [root@server.eademidova.net]:/vagrant/provision/server". The script content is as follows:

```
http.sh [-M--] 25 L: [ 1+17 18/ 20] *(582 / 627b) 0010 0x00A [*] [X]
#!/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
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
firewall-cmd --add-service=https
firewall-cmd --add-service=https --permanent
firewall-cmd --reload
echo "Start http service"
systemctl enable httpd
systemctl start httpd
```

Рис. 10: Содержание http.sh

Заключение

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