

Лабораторная работа №5

Администрирование сетевых подсистем

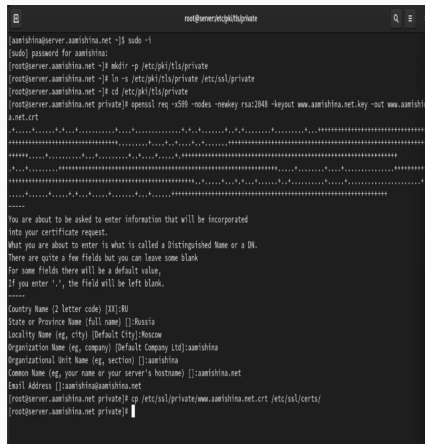
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2 октября 2024

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

Выполнение лабораторной работы

Конфигурирование HTTP-сервера для работы через протокол HTTPS



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

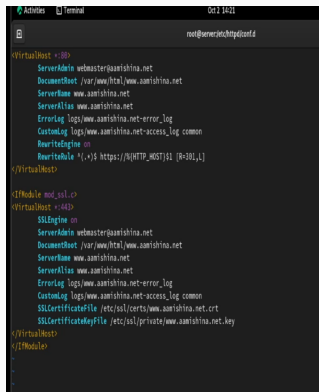
[aamishina@server aamishina.net ~]$ sudo -i
[sudo] password for aamishina:
[root@server aamishina.net ~]# mkdir -p /etc/pki/tls/private
[root@server aamishina.net ~]# ln -s /etc/pki/tls/private /etc/ssl/private
[root@server aamishina.net ~]# cd /etc/pki/tls/private
[root@server aamishina.net private]# openssl req -x509 -nodes -newkey rsa:2048 -keyout www.aamishina.net.key -out www.aamishina.net.crt

-----
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]:aamishina
Organizational Unit Name (eg, section) []:aamishina
Common Name (eg, your name or your server's hostname) []:aamishina.net
Email Address []:aamishina@aamishina.net
[root@server aamishina.net private]# cp /etc/ssl/private/www.aamishina.net.crt /etc/certs/
[root@server aamishina.net private]#
```

Рис. 1: Генерация ключа и заполнение сертификата

```
[root@server.aamishina.net private]# cp /etc/ssl/private/www.aamishina.net.crt /etc/ssl/certs/  
[root@server.aamishina.net private]# cd /etc/httpd/conf.d  
[root@server.aamishina.net conf.d]# vim /etc/httpd/conf.d/www.user.net.conf  
[root@server.aamishina.net conf.d]# vim /etc/httpd/conf.d/www.aamishina.net.conf
```

Рис. 2: Копирование сертификата в каталог /etc/ssl/certs



```
root@server:/etc/httpd/conf.d
<VirtualHost *:80>
    ServerAdmin webmaster@aamishina.net
    DocumentRoot /var/www/html/www.aamishina.net
    ServerName www.aamishina.net
    ServerAlias www.aamishina.net
    ErrorLog logs/www.aamishina.net-error_log
    CustomLog logs/www.aamishina.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@aamishina.net
    DocumentRoot /var/www/html/www.aamishina.net
    ServerName www.aamishina.net
    ServerAlias www.aamishina.net
    ErrorLog logs/www.aamishina.net-error_log
    CustomLog logs/www.aamishina.net-access_log common
    SSLCertificateFile /etc/ssl/certs/www.aamishina.net.crt
    SSLCertificateKeyFile /etc/ssl/private/www.aamishina.net.key
</VirtualHost>
</IfModule>
</VirtualHost>
</VirtualHost>
```

Рис. 3: Редактирование файла /etc/httpd/conf.d/www.aamishina.net

```
[root@server.aamishina.net conf.d]# firewall-cmd --list-services
cockpit dhcp dhcpv6-client dns http ssh
[root@server.aamishina.net conf.d]# firewall-cmd --get-services
AH-Satellite-6 AH-Satellite-6-capsule afp amanda-client amanda-k5-client amqp amqps apcupsd audit ausweisapp2 bacula bacula-cl
ient bareos-director bareos-filedaemon bareos-storage bb bgp bitcoin bitcoin-rpc bitcoin-testnet bitcoin-testnet-rpc bittorren
t-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 docker-swarm dropbox-lansync elasticsearch etcd-clie
nt 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 high-availability http http3 https ident imap imaps ipfs ipp ipp-client ips
ec irc ircs iscsi-target isns jenkins kadmin kdeconnect kerberos kibana klogin kpasswd kprop kshell kube-api kube-apiserver ku
be-control-plane kube-control-plane-secure kube-controller-manager kube-controller-manager-secure kube-nodeport-services kube-
scheduler kube-scheduler-secure kube-worker kubelet kubelet-readonly kubelet-worker ldap ldaps libvirt libvirt-tls lightning-n
etwork llmnr llmnr-client llmnr-tcp llmnr-udp managessie matrix mdns memcache minidlna mongodb mosh mounid mqtt mqtt-tls ns-w
bt mssql murmur mysql nbd nebula netbios-ns netdata-dashboard nfs nfs3 nmap-0183 nrpe ntp nut openvpn ovirt-imageio ovirt-stor
ageconsole ovirt-vmconsole plex pmcd pmproxy pmwebapi pmwebapi3 pop3 pop3s postgresql privoxy prometheus prometheus-node-expor
ter proxy-dhcp ps2link ps3netdrv ptp pulseaudio puppetmaster quassel radius rdp redis redis-sentinel rpc-bind rquotad rsh rsyn
cd rtsp salt-master samba samba-client samba-dc sane sip sips slp smtp smtp-submission snmp snmp-tls snmp-trap snmptra
p spideroak-lansync spotify-sync squid sssd ssh steam-streaming svdrp svn synching synching-gui synching-relay synergy sysl
og syslog-tls telnet tentacle tftp tile38 tinc tor-socks transmission-client upnp-client vdsn vnc-server warpinator wben-http
wben-https wireguard ws-discovery ws-discovery-client ws-discovery-tcp ws-discovery-udp wsman wsmans xdmcp xmp-bosh xmp-clie
nt xmp-local xmp-server zabbix-agent zabbix-server zerotier
[root@server.aamishina.net conf.d]# firewall-cmd --add-service=https
success
[root@server.aamishina.net conf.d]# firewall-cmd --add-service=https --permanent
success
[root@server.aamishina.net conf.d]# firewall-cmd --reload
success
[root@server.aamishina.net conf.d]# systemctl restart httpd
```

Рис. 4: Внесение изменений в настройки межсетевого экрана, перезапуск веб-сервера

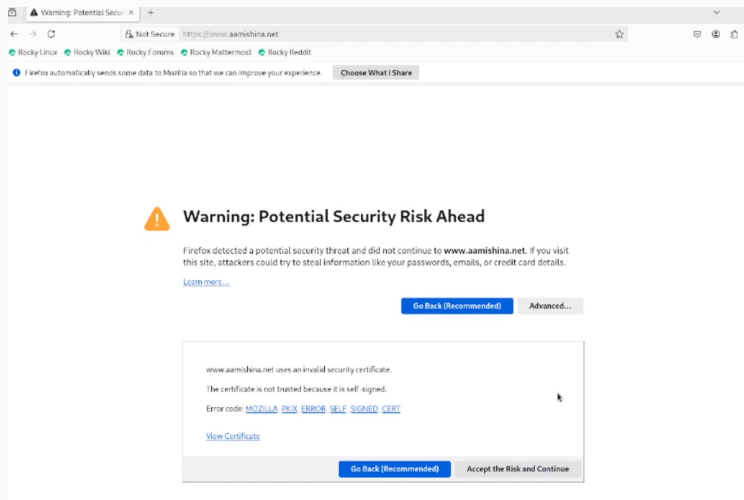


Рис. 5: Сообщение о незащищенности соединения

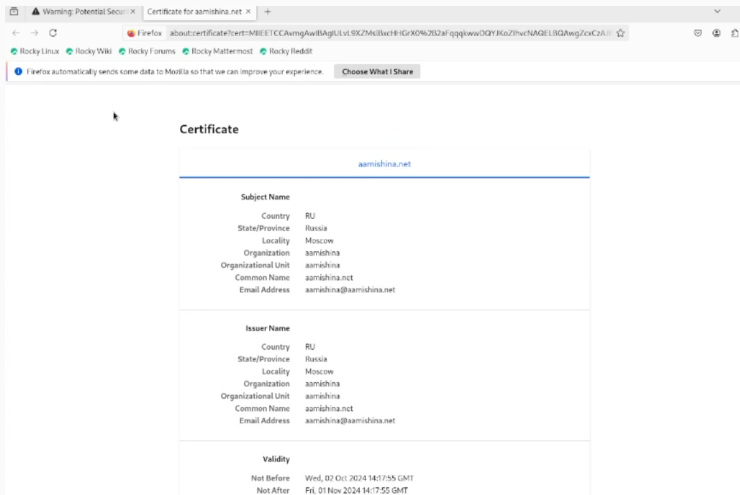


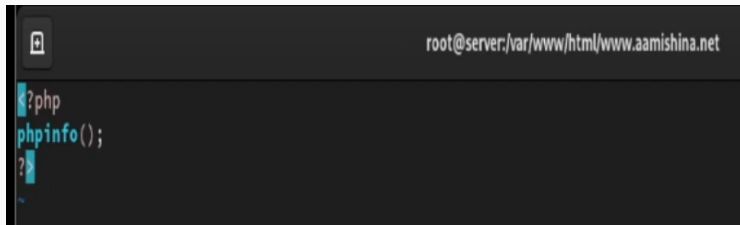
Рис. 6: Содержимое сертификата

Конфигурирование HTTP-сервера для работы с PHP

```
Installed:
nginxfilesystem-1:1.20.1-16.el9_4.1.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-xml-8.0.30-1.el9_2.x86_64

Complete!
[root@server.aamishina.net conf.d]# cd /var/www/html/www.aamishina.net
[root@server.aamishina.net www.aamishina.net]# ls
index.html
[root@server.aamishina.net www.aamishina.net]# rm index.html
rm: remove regular file 'index.html'? y
[root@server.aamishina.net www.aamishina.net]# touch index.php
[root@server.aamishina.net www.aamishina.net]# vim index.php
```

Рис. 7: Замена файла /var/www/html/www.aamishina.net/index.html на index.php



A screenshot of a terminal window with a dark background. The title bar at the top shows a window icon on the left and the text 'root@server:/var/www/html/www.aamishina.net' on the right. The terminal content shows PHP code being edited: the first line is '<?php' with the opening tag highlighted in blue; the second line is 'phpinfo();' with 'phpinfo' highlighted in blue; and the third line is '?>' with the closing tag highlighted in blue. A cursor is visible at the end of the third line.

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

Рис. 8: Редактирование index.php

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

Рис. 9: Корректирование прав доступа, восстановление контекста безопасности SELinux, перезагрузка HTTP-сервера

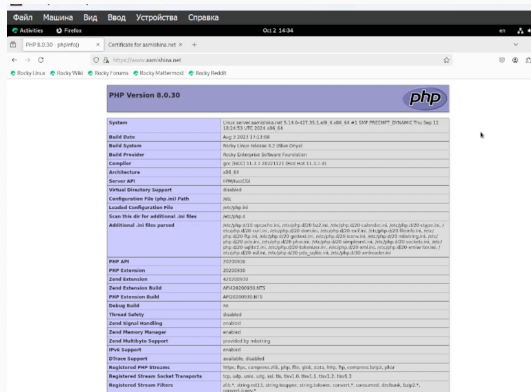


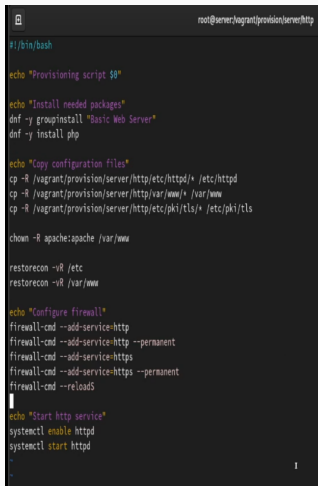
Рис. 10: Веб-страница с информацией об используемой версии PHP

Внесение изменений в настройки
внутреннего окружения
виртуальной машины

Настройки внутреннего окружения

```
[root@server.aamishina.net www.aamishina.net]# cd /vagrant/provision/server/http
[root@server.aamishina.net 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'? y
cp: overwrite '/vagrant/provision/server/http/etc/httpd/conf.d/fcgid.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.aamishina.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.aamishina.net.conf'? y
[root@server.aamishina.net http]# cp -R /var/www/html/* /vagrant/provision/server/http/var/www/html
cp: overwrite '/vagrant/provision/server/http/var/www/html/server.aamishina.net/index.html'? y
[root@server.aamishina.net http]# mkdir -p /vagrant/provision/server/http/etc/pki/tls/private
[root@server.aamishina.net http]# mkdir -p /vagrant/provision/server/http/etc/pki/tls/certs
[root@server.aamishina.net http]# cp -R /etc/pki/tls/private/www.aamishina.net.key /vagrant/provision/server/http/etc/pki/tls/private
[root@server.aamishina.net http]# cp -R /etc/pki/tls/certs/www.aamishina.net.crt /vagrant/provision/server/http/etc/pki/tls/certs
[root@server.aamishina.net http]# vim /vagrant/provision/server/http/sh
```

Рис. 11: Копируем в каталоги конфигурационные файлы



```
root@server:/vagrant/provision/server/http

#!/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/pki/tls/* /etc/pki/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-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. 12: Внесение изменений в скрипт http.sh

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