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# Final Exam

Practical



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## Task 1

### Server Name configuration

**nmcli general hostname server12**

```
[root@localhost ~]# nmcli general hostname server12.exam.com  
[root@localhost ~]#
```

Vim /etc/hosts

**192.168.200.1 server12.exam.com**

```
127.0.0.1    localhost localhost.localdomain localhost4 localhost4.localdomain4  
::1         localhost localhost.localdomain localhost6 localhost6.localdomain6  
192.168.200.1 server12.exam.com  
~
```

## Install and configure Apache

### Dnf install httpd -y

```
[root@server12 ~]# dnf install httpd -y
```

```
Installed:
  almalinux-logos-httpd-90.5.1-1.1.el9.noarch apr-1.7.0-12.el9_3.x86_64      apr-util-1.6.1-23.el9.x86_64      apr-util-bd
  apr-util-openssl-1.6.1-23.el9.x86_64      httpd-2.4.62-1.el9_5.2.x86_64      httpd-core-2.4.62-1.el9_5.2.x86_64 httpd-files
  httpd-tools-2.4.62-1.el9_5.2.x86_64      mod_http2-2.0.26-2.el9_4.1.x86_64 mod_lua-2.4.62-1.el9_5.2.x86_64

Complete!
[root@server12 ~]#
```

### Systemctl start httpd

```
Complete!
[root@server12 ~]# systemctl start httpd
```

### Systemctl enable httpd

### Systemctl status httpd

```
[root@server12 ~]# systemctl enable httpd
Created symlink /etc/systemd/system/multi-user.target.wants/httpd.service → /usr/lib/systemd/system/httpd.service.
[root@server12 ~]# systemctl status httpd
● httpd.service - The Apache HTTP Server
   Loaded: loaded (/usr/lib/systemd/system/httpd.service; enabled; preset: disabled)
   Active: active (running) since Mon 2025-04-28 09:41:33 EDT; 11s ago
     Docs: man:httpd.service(8)
  Main PID: 33604 (httpd)
    Status: "Total requests: 0; Idle/Busy workers 100/0;Requests/sec: 0; Bytes served/sec: 0 B/sec"
    Tasks: 177 (limit: 22757)
   Memory: 30.0M
      CPU: 33ms
   CGroup: /system.slice/httpd.service
           └─33604 /usr/sbin/httpd -DFOREGROUND
             └─33605 /usr/sbin/httpd -DFOREGROUND
               └─33609 /usr/sbin/httpd -DFOREGROUND
                 └─33610 /usr/sbin/httpd -DFOREGROUND
                   └─33611 /usr/sbin/httpd -DFOREGROUND

Apr 28 09:41:33 server12.exam.com systemd[1]: Starting The Apache HTTP Server...
Apr 28 09:41:33 server12.exam.com systemd[1]: Started The Apache HTTP Server.
Apr 28 09:41:33 server12.exam.com httpd[33604]: Server configured, listening on: port 80
[root@server12 ~]#
```

## Creating the /exam directory

### Mkdir -p /var/www/exam

```
[root@server12 ~]# mkdir -p /var/www/exam
[root@server12 ~]#
```

```
[root@server12 ~]# cd /var/www
[root@server12 www]# ll
total 0
drwxr-xr-x 2 root root 6 Jan 21 16:23 cgi-bin
drwxr-xr-x 2 root root 6 Apr 28 09:44 exam
drwxr-xr-x 2 root root 6 Jan 21 16:23 html
[root@server12 www]#
```

## Set permissions

```
[root@server12 www]# chmod +x /var/www/exam
[root@server12 www]#
```

## Configure Apache

```
DocumentRoot "/var/www/exam/"
```

```
<Directory "/var/www/exam">
    Options FollowSymLinks
    AllowOverride None
    Require all granted
</Directory>

<VirtualHost 192.168.200.1:80>
    ServerName server12.exam.com
    DocumentRoot /var/www/exam
    <Directory "/var/www/exam">
        Require all granted
        Options Indexes FollowSymLinks
    </Directory>
</VirtualHost>
```

```
[root@server12 www]# systemctl restart httpd
```

## Webpage

```
[root@server12 www]# nano /var/www/exam/index.html
```

```

<!DOCTYPE html>
<html>
<head>
  <title>Final Exam</title>
</head>
<body>
  <h1>Final Exam</h1>
</body>
</html>

  <h2>Question 2</h2>

  <ul>

    <li><a href=http://127.0.0.1/q2/index.html>Access to Q2 with 127.0.0.1 - Denied</a></li>

    <li><a href=http://192.168.200.1/q2/index.html>Access to Q2 with 192.168.200.0 - Authorized</a></li>

  </ul>

  <h2>Question 3</h2>

  <li><a href=http://192.168.200.1/secure_exam/index.html>Roger, 192.168.200.1 - Authorized</a></li>

  <li><a href=http://127.0.0.1/secure_exam/index.html>from 127.0.0.0 - Denied</a></li>

  <li><a href=http://192.168.200.1/secure2_exam/index.html>Roger, 192.168.200.1 - Authorized</a></li>

```

```

  <li><a href=http://127.0.0.1/secure_exam/index.html>from 127.0.0.0 - Denied</a></li>

  <li><a href=http://192.168.200.1/secure2_exam/index.html>Roger, 192.168.200.1 - Authorized</a></li>

  <li><a href=http://127.0.0.1/secure2_exam/index.html>Roger, 127.0.0.0 - Authorized</a></li>

</ul>

<h2>Question 4</h2>

  <li><a href=http://virtuel2.exam.com:8000>Virtual Host 2 (virtuel2.exam.com:8000)</a></li>

  <li><a href=http://virtuel1.exam.com:80>Virtual Host 1 (virtuel1.exam.com:80)</a></li>

  <h2>Question 5</h2>

  <li><a href=http://192.168.200.1/cgi-bin/exam.pl>CGI/PERL with 192.168.200.0 - Authorized</a></li>

  <li><a href=http://127.0.0.1/cgi-bin/exam.pl>CGI/PERL with 127.0.0.0 - Denied</a></li>

</body>
</html>

```

```

[root@server12 www]# chmod +x /var/www/exam/index.html
[root@server12 www]#

```



```
[root@server12 www]# systemctl restart httpd
[root@server12 www]#
```

## Task 2

### Website Creation

Create the directory `/var/www/exam/q2` and configure the Apache server so that it is only accessible to computers on the 192.168.200 subnet. Create a web page that automatically displays in the browser when the directory address is entered. The page must display the text "Q2".

#### Creating the Q2 directory

Mkdir -p `/var/www/exam/q2`

```
[root@server12 www]# mkdir -p /var/www/exam/q2
[root@server12 www]# cd /var/www/exam
[root@server12 exam]# ll
total 4
-rwxr-xr-x 1 root root 1228 Apr 28 10:50 index.html
drwxr-xr-x 2 root root    6 Apr 28 10:54 q2
[root@server12 exam]#
```

Set permissions:

**chmod +x /var/www/exam/q2**

```
[root@server12 exam]# chmod +x /var/www/exam/q2  
[root@server12 exam]#
```

Configure Apache

```
<Directory /var/www/exam/q2>  
    Options Indexes FollowSymLinks  
    AllowOverride None  
    Require ip 192.168.200.0/24  
</Directory>
```

Create the index.html

**nano /var/www/exam/q2/index.html**

```
<!DOCTYPE html>

<html>

<head>

    <title>Q2</title>

</head>

<body>

    <h1>Q2</h1>

</body>

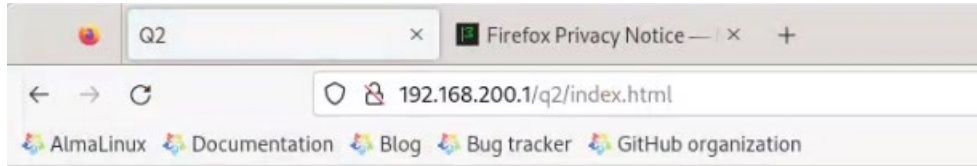
</html>
```

## Testing

### Q2 from 127.0.0.1



### Q2 from 192.168.200.1



## Q2

## Task 3

### Secure\_Exam

Create the `secure_exam` directory inside `/var/www/exam` and configure Apache so that only the user `roger` using the IP address `192.168.200.1`, and the password `exam`, can access it. All other users must be denied access.

### Creating the directory and setting permissions

```
[root@server12 exam]# mkdir -p /var/www/exam/secure_exam
[root@server12 exam]# chmod +x /var/www/exam/secure_exam
[root@server12 exam]# cd /var/www/exam
[root@server12 exam]# ll
total 4
-rwxr-xr-x 1 root root 1228 Apr 28 10:50 index.html
drwxr-xr-x 2 root root  24 Apr 28 11:00 q2
drwxr-xr-x 2 root root   6 Apr 28 11:07 secure_exam
[root@server12 exam]#
```

## Creating the secure\_exam index file

```
[root@server12 exam]# nano /var/www/exam/secure_exam/index.html
```

```
<h1>Secure Exam</h1>
```

## Creating the user roger and .htpasswd

```
[root@server12 exam]# htpasswd -bc /var/www/.htpasswd roger exam
Adding password for user roger
[root@server12 exam]#
```

## Configuring Apache

```
<Directory "/var/www/exam/secure_exam">
    AuthType Basic
    AuthName "Access to Secure_Exam"
    AuthUserFile "/var/www/.htpasswd"
<RequireAll>
    Require ip 192.168.200.1
    Require user roger
</RequireAll>
</Directory>
```

## Testing

From 192.168.200.1 with user Roger and password Exam

192.168.200.1

This site is asking you to sign in.

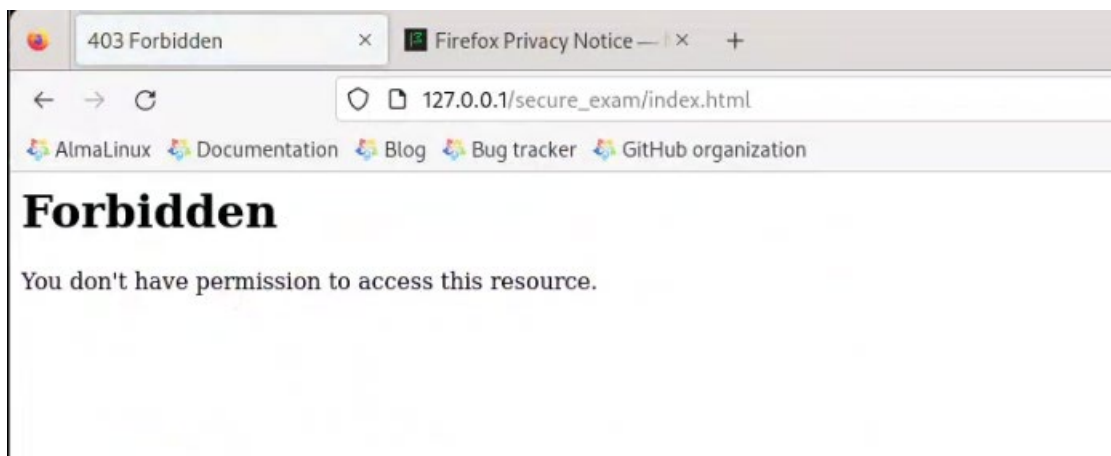
Username

Password



## Secure Exam

From 127.0.0.1



## Secure2\_Exam

Create a secure\_exam2 directory inside /var/www/exam and place an .htaccess file in it to define that only the user roger can access the web pages in this directory or just using the IP address 192.168.200.1.

### Creating the secure2\_exam directory and setting permissions

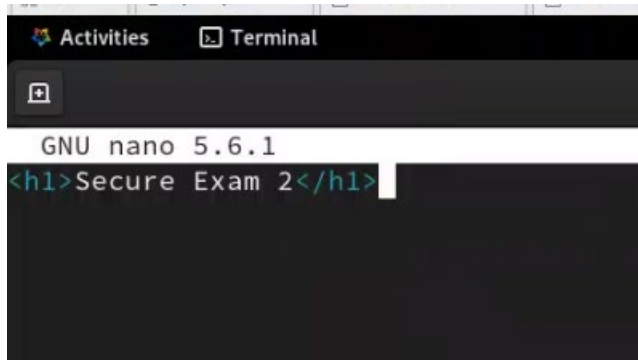
**Mkdir -p /var/www/exam/secure2\_exam**

```
[root@server12 exam]# mkdir -p /var/www/exam/secure2_exam
[root@server12 exam]# chmod +x /var/www/exam/secure2_exam
[root@server12 exam]# cd /var/www/exam/
[root@server12 exam]# ll
total 4
-rwxr-xr-x 1 root root 1228 Apr 28 11:24 index.html
drwxr-xr-x 2 root root  24 Apr 28 11:00 q2
drwxr-xr-x 2 root root   6 Apr 28 11:44 secure2_exam
drwxr-xr-x 2 root root  24 Apr 28 11:10 secure_exam
[root@server12 exam]#
```

### Creating the secure2\_exam index file

**Nano /var/www/exam/secure2\_exam/index.html**

```
[root@server12 exam]# nano /var/www/exam/secure2_exam/index.html
[root@server12 exam]#
```



Creating the .htaccess file

```
[root@server12 exam]# nano /var/www/exam/secure2_exam/.htaccess
```

```
<Directory "/var/www/exam/secure2_exam">
    AuthType Basic
    AuthName "Access to secure2_exam"
    AuthUserFile "/var/www/.htpasswd"
<RequireAny>
    Require ip 192.168.200.1
    Require user roger
</RequireAny>
</Directory>
```

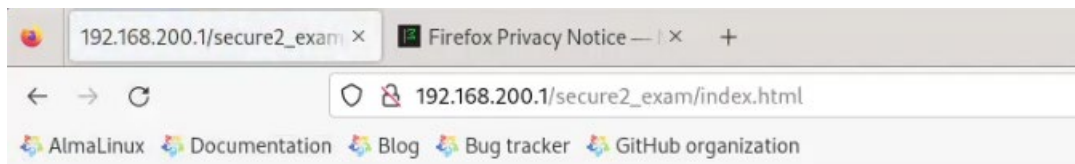


In httpd.conf

```
<Directory /var/www/exam/secure_exam2>  
    AllowOverride AuthConfig  
    Options Indexes FollowSymLinks  
</Directory>
```

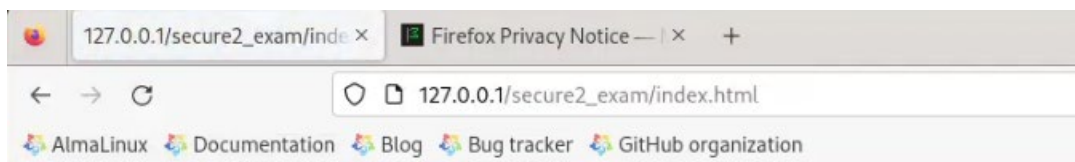
Testing

Roger with 192.168.200.1



## Secure Exam 2

Roger with 127.0.0.1



## Secure Exam 2

## Task 4

Create name-based and port-based virtual hosts using the hostnames listed below. Use the same IP address 192.168.200.1 for all virtual servers. DNS-based name resolution must be used for hostname resolution.

### DNS configuration

```
[root@server12 exam]# dnf install -y bind
Last metadata expiration check: 1:45:45 ago on Mon 28 Apr 2025 10:36:08 AM.
Dependencies resolved.
=====
Package                                Architecture      Version           Repository        Size
=====
Installing:
bind                                   x86_64            32:9.16.23-24.el9_5.3  appstream         490 k
Upgrading:
bind-libs                             x86_64            32:9.16.23-24.el9_5.3  appstream         1.2 M
bind-license                           noarch            32:9.16.23-24.el9_5.3  appstream          12 k
bind-utils                             x86_64            32:9.16.23-24.el9_5.3  appstream         201 k
Installing dependencies:
bind-dnssec-doc                        noarch            32:9.16.23-24.el9_5.3  appstream          45 k
python3-bind                           noarch            32:9.16.23-24.el9_5.3  appstream          60 k
python3-ply                            noarch            3.11-14.el9           baseos            103 k
Installing weak dependencies:
bind-dnssec-utils                      x86_64            32:9.16.23-24.el9_5.3  appstream         114 k
Transaction Summary
=====
```

### Modifying named.conf

```
//
// named.conf
//
// Provided by Red Hat bind package to configure the ISC BIND named(8) DNS
// server as a caching only nameserver (as a localhost DNS resolver only).
//
// See /usr/share/doc/bind*/sample/ for example named configuration files.
//

options {
    listen-on port 53 { 127.0.0.1; 192.168.200.1; };
    listen-on-v6 port 53 { ::1; };
    directory "/var/named";
    dump-file "/var/named/data/cache_dump.db";
    statistics-file "/var/named/data/named_stats.txt";
    memstatistics-file "/var/named/data/named_mem_stats.txt";
    secroots-file "/var/named/data/named.secroots";
    recursing-file "/var/named/data/named.recursing";
    allow-query { localhost; 192.168.200.0/24; };
```

## Configuring zones

```
$TTL 86400
@      IN  SOA server12.exam.com. root.exam.com. (
        2025042801 ; serial
        3600       ; refresh
        1800       ; retry
        604800     ; expire
        86400      ; minimum TTL
      )

      IN  NS  server12.exam.com.
server12 IN  A   192.168.200.1
virtuel1 IN  A   192.168.200.1
virtuel2 IN  A   192.168.200.1
```

Verify zone:

```
[root@server12 exam]# named-checkzone exam.com /var/named/exam.com.zone
zone exam.com/IN: loaded serial 2025042801
OK
[root@server12 exam]#
```

```
[root@server12 exam]# nslookup virtuel1.exam.com 192.168.200.1
Server:          192.168.200.1
Address:         192.168.200.1#53
```

```
Name:   virtuel1.exam.com
Address: 192.168.200.1
```

```
[root@server12 exam]# nslookup virtuel2.exam.com 192.168.200.1
Server:          192.168.200.1
Address:         192.168.200.1#53
```

```
Name:   virtuel2.exam.com
Address: 192.168.200.1
```

```
[root@server12 exam]#
```

```
# Generated by NetworkManager
search localdomain exam.com
nameserver 192.168.200.1
```

## Creating the directories

```
mkdir -p /var/www/exam/q5/virtuel1_80
```

```
mkdir -p /var/www/exam/q5/virtuel2_8000
```

```
[root@server12 exam]# mkdir -p /var/www/exam/q5/virtuel1_80
[root@server12 exam]# mkdir -p /var/www/exam/q5/virtuel2_8000
[root@server12 exam]# chmod +x /var/www/exam/q5/
[root@server12 exam]# cd /var/www/exam/q5/
[root@server12 q5]# ll
total 0
drwxr-xr-x 2 root root 6 Apr 28 12:53 virtuel1_80
drwxr-xr-x 2 root root 6 Apr 28 12:53 virtuel2_8000
[root@server12 q5]#
```

## Index files and permissions

```
<h1>virtuel2.exam.com port 8000</h1>
```

```
<h1> virtuel1.exam.com port 80</h1>
```

```
[root@server12 q5]# chmod +x /var/www/exam/q5/*/index.html
```

## Configuring Apache

```
#  
#Listen 12.34.56.78:80  
Listen 80  
Listen 8000  
# Dynamic Shared Object (DSO) Support  
#  
# To be able to use the functionality
```

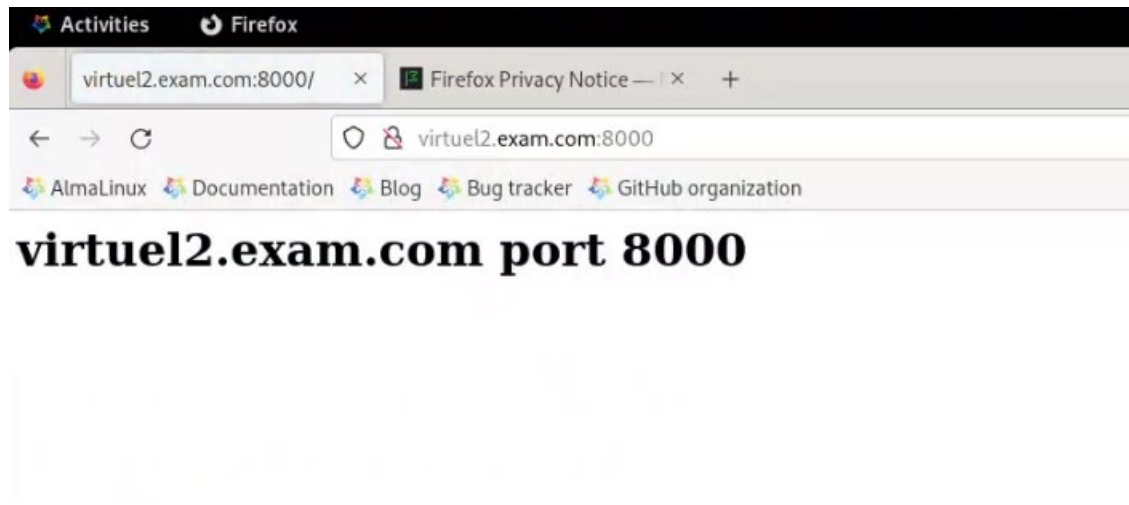
```
<VirtualHost 192.168.200.1:80>  
    ServerName virtuel1.exam.com  
    DocumentRoot /var/www/exam/q5/virtuel1_80  
    <Directory /var/www/exam/q5/virtuel1_80>  
        Options Indexes FollowSymLinks  
        AllowOverride None  
        Require all granted  
    </Directory>  
</VirtualHost>  
  
<VirtualHost 192.168.200.1:8000>  
    ServerName virtuel2.exam.com  
    DocumentRoot /var/www/exam/q5/virtuel2_8000  
    <Directory /var/www/exam/q5/virtuel2_8000>  
        Options Indexes FollowSymLinks  
        AllowOverride None  
        Require all granted  
    </Directory>  
</VirtualHost>
```

Restart Apache

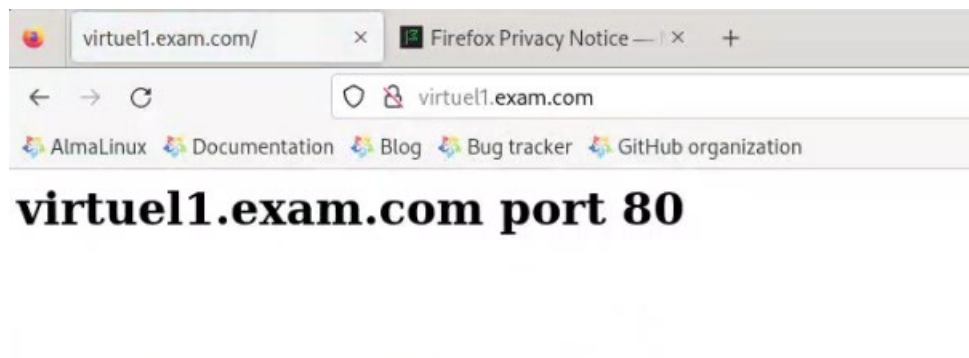
```
[root@server12 q5]# systemctl restart httpd  
[root@server12 q5]#
```

## Testing

**Virtual2 from virtuel2.exam.com:8000**



Virtual 1 from virtuel1.exam.com:80



## Task 5

CGI Directory

```
[root@server12 exam]# mkdir -p /var/www/exam/cgi-bin  
[root@server12 exam]#
```

```
[root@server12 exam]# chmod +x /var/www/exam/cgi-bin  
[root@server12 exam]#
```

## Apache Configuration

```
<Directory /var/www/exam/cgi-bin>  
    Options +ExecCGI  
    AddHandler cgi-script .cgi .pl  
    Require ip 192.168.200.1  
</Directory>
```

Create the PERL script :

**Vim /var/www/exam/cgi-bin/exam.pl**

```
#!/usr/bin/perl  
  
print "Content-type: text/html\n\n";  
  
print "<html><head><title>CGI Exam</title></head><body>";  
  
print "<h1>Examen CGI</h1>";  
  
print "</body></html>";  
~  
~  
~
```

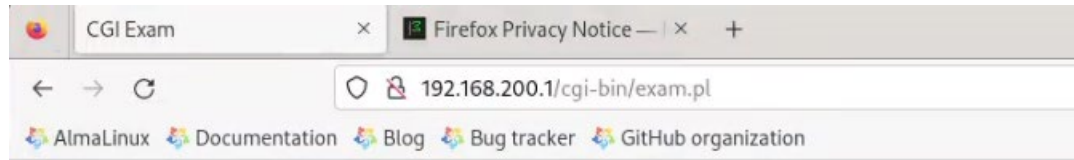
Change permissions:

```
[root@server12 exam]# chmod +x /var/www/exam/cgi-bin/exam.pl  
[root@server12 exam]#
```



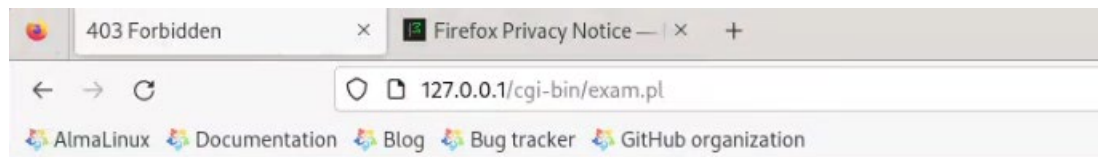
## Testing

PERL with 192.168.200.1



## Examen CGI

PERL with 127.0.0.1



## Forbidden

You don't have permission to access this resource.