

# Linux Servers

## Labra 3

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## Sisältö

1	Basic VirtualHost configuration.....	2
2	MySQL and PHP .....	7
3	Application installation.....	10
4	Access control .....	12
5	.htaccess .....	14

## 1 Basic VirtualHost configuration

Installing Apache with SSL support

```
[k8684@lab1.k8684.local ~]$ sudo yum install httpd mod_ssl
```

Required config files are the by default

```
[root@lab1.k8684.local services]# cat https.xml
<?xml version="1.0" encoding="utf-8"?>
<service>
  <short>Secure WWW (HTTPS)</short>
  <description>HTTPS is a modified HTTP used to serve Web pages when security is important. Examples are sites that require logins like stores or web mail. This option is not required for viewing pages locally or developing Web pages. You need the httpd package installed for this option to be useful.</description>
  <port protocol="tcp" port="443"/>
</service>
[root@lab1.k8684.local services]# cat http
cat: http: No such file or directory
[root@lab1.k8684.local services]# cat http.xml
<?xml version="1.0" encoding="utf-8"?>
<service>
  <short>WWW (HTTP)</short>
  <description>HTTP is the protocol used to serve Web pages. If you plan to make your Web server publicly available, enable this option. This option is not required for viewing pages locally or developing Web pages.</description>
  <port protocol="tcp" port="80"/>
</service>
```

Allowing default HTTP and HTTPS port through firewalld(port 80 and port 443)

```
[k8684@lab1.k8684.local ~]$ sudo firewall-cmd --permanent --add-port=80/tcp
success
[k8684@lab1.k8684.local ~]$ sudo firewall-cmd --permanent --add-port=443/tcp
success
[k8684@lab1.k8684.local ~]$ sudo firewall-cmd --reload
success
[k8684@lab1.k8684.local ~]$
```

Sisältö

Also enabling apache to start on boot, and apache is running

```
[k8684@lab1.k8684.local ~]$ systemctl status httpd.service
● httpd.service - The Apache HTTP Server
   Loaded: loaded (/usr/lib/systemd/system/httpd.service; enabled; vendor preset: disabled)
   Active: active (running) since Tue 2019-11-26 01:11:56 EET; 13s ago
     Docs: man:httpd(8)
           man:apachectl(8)
  Main PID: 1069 (httpd)
    Status: "Total requests: 0; Current requests/sec: 0; Current traffic:  0 B/sec"
    CGroup: /system.slice/httpd.service
            └─1069 /usr/sbin/httpd -DFOREGROUND
              └─1119 /usr/sbin/httpd -DFOREGROUND
                └─1120 /usr/sbin/httpd -DFOREGROUND
                  └─1121 /usr/sbin/httpd -DFOREGROUND
                    └─1122 /usr/sbin/httpd -DFOREGROUND
                      └─1123 /usr/sbin/httpd -DFOREGROUND

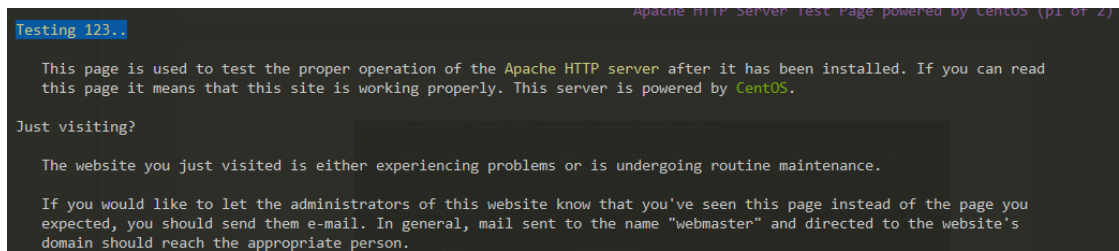
Nov 26 01:11:54 lab1.k8684.local systemd[1]: Starting The Apache HTTP Server...
Nov 26 01:11:56 lab1.k8684.local systemd[1]: Started The Apache HTTP Server.
```

For some reason cant access Apache from host machine, installing lynx to test localhost

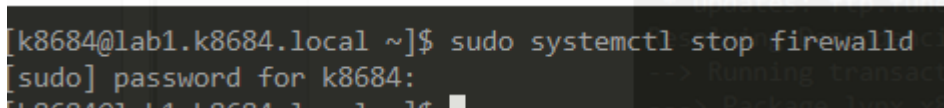
```
[k8684@lab1.k8684.local ~]$ sudo yum install lynx
[sudo] password for k8684:
Loaded plugins: fastestmirror, langpacks
Loading mirror speeds from cached hostfile
 * base: ftp.funet.fi
 * epel: www.nic.funet.fi
 * extras: ftp.funet.fi
 * updates: ftp.funet.fi
Resolving Dependencies
--> Running transaction check
---> Package lynx.x86_64 0:2.8.8-0.3.dev15.el7 will be installed
--> Finished Dependency Resolution

|
```

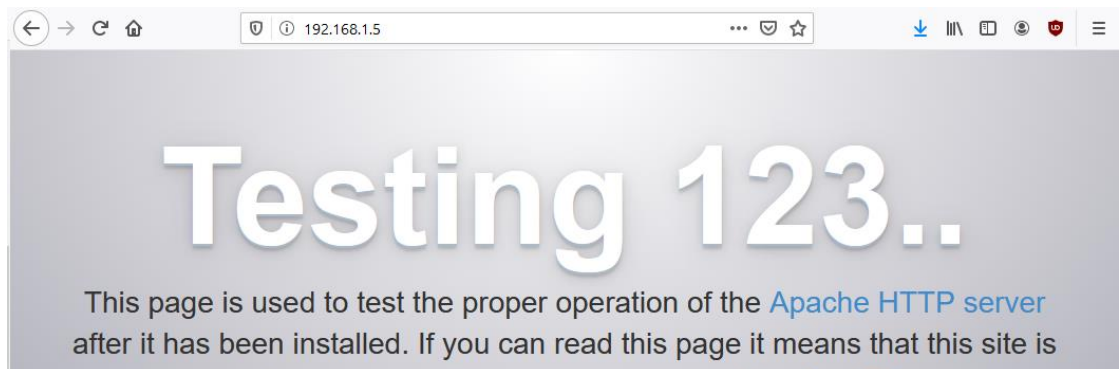
As we can see, apache is working on localhost, problem elsewhere



After stopping firewalld

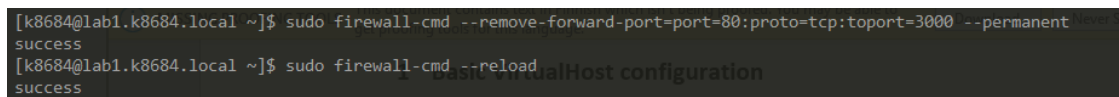


Apache starts to work on host machine, so problem is in rules

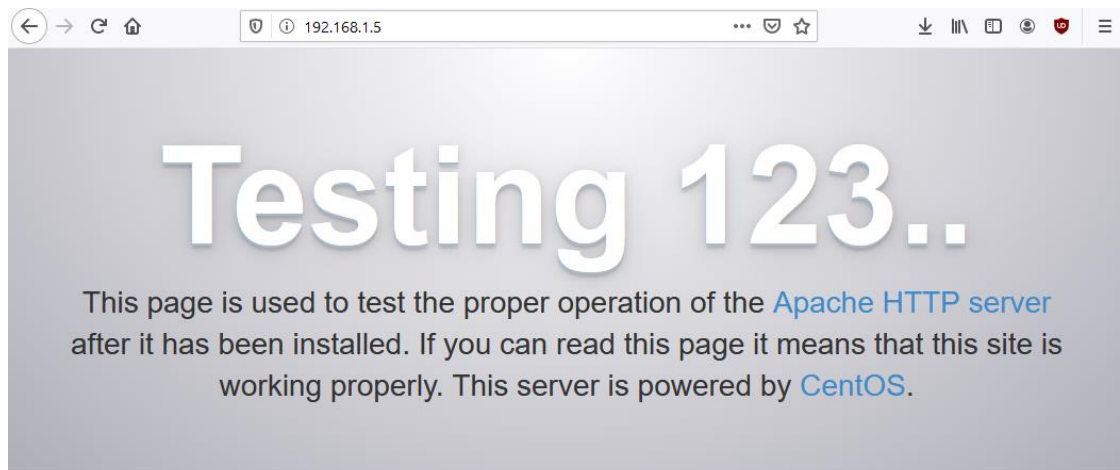


After wasting some amount of time, I suddenly remembered what I did a port forwarding during labra 2 – and this machine is clone of labra 2.

So, solution was simple, just had to remove port forwarding ...



And now everything works like a charm



### Just visiting?

The website you just visited is either experiencing problems or is undergoing routine maintenance.

If you would like to let the administrators of this website know that you've seen this page instead of the page you expected

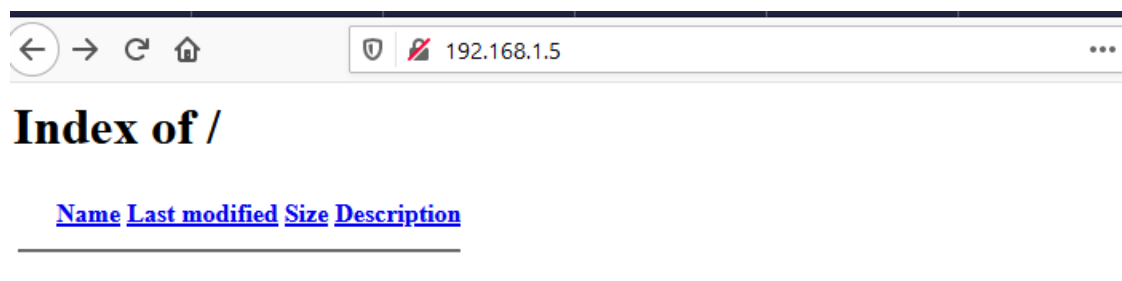
### Are you the Administrator?

You should add your website content to the directory `/var/www/html/`.

To prevent this page from ever being used, follow the instructions in the file `/etc/httpd/conf.d/welcome.conf`.

### Promoting Apache and CentOS

Default page disabled by commenting out all lines in conf file



Giving different names for host

```

GNU nano 2.3.1 File: /etc/httpd/conf.d/01_defau
VirtualHost *:80>
    ServerName lx.k8684.zz
    DocumentRoot /var/www/html/
</VirtualHost>
<VirtualHost *:443>
    ServerName lx.k8684.zz
    DocumentRoot /var/www/html/
    SSLEngine On
    SSLCertificateFile /etc/pki/tls/certs/localhost.crt
    SSLCertificateKeyFile /etc/pki/tls/private/localhost.key
</VirtualHost>
1 page of

```

Had to modify hosts file on host machine

```

192.168.1.5    lx.k8684.zz

```

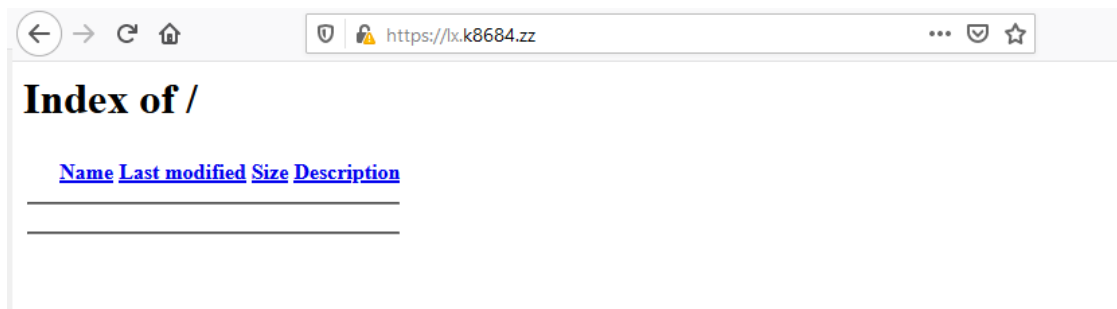
Adding redirect rule

```

VirtualHost *:80>
    ServerName lx.k8684.zz
    DocumentRoot /var/www/html/
    Redirect permanent / https://lx.k8684.zz|
</VirtualHost>
<VirtualHost *:443>

```

After restart redirect is working while trying to access lx.k8684.zz



## 2 MySQL and PHP

```
You need to be root to perform this command.  
[k8684@lab1.k8684.local ~]$ sudo yum install mariadb-server mariadb  
Loaded plugins: fastestmirror, langpacks
```

```
[k8684@lab1.k8684.local ~]$ systemctl enable mariadb.service
```

```
password.  
==== AUTHENTICATION COMPLETE ====  
[k8684@lab1.k8684.local ~]$ mysql_secure_installation  
  
NOTE: RUNNING ALL PARTS OF THIS SCRIPT IS RECOMMENDED FOR ALL MariaDB  
SERVERS IN PRODUCTION USE! PLEASE READ EACH STEP CAREFULLY!  
  
In order to log into MariaDB to secure it, we'll need the current  
password for the root user. If you've just installed MariaDB, and  
you haven't set the root password yet, the password will be blank,  
so you should just press enter here.  
  
Enter current password for root (enter for none):  
ERROR 1045 (28000): Access denied for user 'root'@'localhost' (using password: YES)  
Enter current password for root (enter for none):  
ERROR 1045 (28000): Access denied for user 'root'@'localhost' (using password: YES)  
Enter current password for root (enter for none):  
OK, successfully used password, moving on..  
  
Setting the root password ensures that nobody can log into the MariaDB  
root user without the proper authorisation.  
  
Set root password? [Y/n] Y  
New password:  
Re-enter new password:  
Password updated successfully!  
Reloading privilege tables..  
... Success!
```

## Loggin In

```
[k8684@lab1.k8684.local ~]$ mysql -u root -p
Enter password:
Welcome to the MariaDB monitor.  Commands end with ; or \g.
Your MariaDB connection id is 10
Server version: 5.5.64-MariaDB MariaDB Server

Copyright (c) 2000, 2018, Oracle, MariaDB Corporation Ab and others.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.
```

## Creating new database and granting access

```
MariaDB [(none)]> CREATE DATABASE files CHARACTER SET utf8mb4 COLLATE utf8mb4_unicode_ci;
Query OK, 1 row affected (0.01 sec)

MariaDB [(none)]> GRANT ALL PRIVILEGES ON files.* to filesql@localhost IDENTIFIED BY 'kissa123';
```

## Can access database

```
[k8684@lab1.k8684.local ~]$ mysql -u filesql -p files
Enter password:
Welcome to the MariaDB monitor.  Commands end with ; or \g.
Your MariaDB connection id is 11
Server version: 5.5.64-MariaDB MariaDB Server

Copyright (c) 2000, 2018, Oracle, MariaDB Corporation Ab and others.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.
```

## Turning on Boolean

```
[k8684@lab1.k8684.local ~]$ getsebool httpd_can_network_connect_db
httpd_can_network_connect_db --> on
```

## Installing php and php-mysql




```
Remove test database and access to it. [1/1] y  
[k8684@lab1.k8684.local ~]$ sudo yum install php php-mysql
```

Changing timezone

```
date.timezone = Europe/Helsinki
```

Now it is possible to access phpinfo

Browser address bar: <https://lx.k8684.zz/phpinfo/>

**PHP Version 5.4.16** 

System	Linux lab1.k8684.local 3.10.0-1062.4.3.el7.x86_64 #1 SMP Wed Nov 13 23:58:53 UTC 2019 x86_64
Build Date	Nov 1 2019 16:05:03
Server API	Apache 2.0 Handler
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/curl.ini, /etc/php.d/fileinfo.ini, /etc/php.d/json.ini, /etc/php.d/mysql.ini, /etc/php.d/mysqli.ini, /etc/php.d/pdo.ini, /etc/php.d/pdo_mysql.ini, /etc/php.d/pdo_sqlite.ini, /etc/php.d/phar.ini, /etc/php.d/sqlite3.ini, /etc/php.d/zip.ini
PHP API	20100412
PHP Extension	20100525
Zend Extension	220100525
Zend Extension Build	API220100525,NTS
PHP Extension Build	API20100525,NTS
Debug Build	no
Thread Safety	disabled

### 3 Application installation

```
[k8684@lab1.k8684.local Downloads]$ wget https://student.labranet.jamk.fi/~jojuh/lx/filesql.tar.gz
--2019-11-28 00:21:34-- https://student.labranet.jamk.fi/~jojuh/lx/filesql.tar.gz
Resolving student.labranet.jamk.fi (student.labranet.jamk.fi)... 195.148.26.130
Connecting to student.labranet.jamk.fi (student.labranet.jamk.fi)|195.148.26.130|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 1671 (1.6K) [application/x-gzip]
Saving to: 'filesql.tar.gz'

100%[=====>] 1,671 --.-K/s in 0s

2019-11-28 00:21:35 (32.6 MB/s) - 'filesql.tar.gz' saved [1671/1671]
```

#### Extracting

```
[k8684@lab1.k8684.local Downloads]$ mkdir filesql
[k8684@lab1.k8684.local Downloads]$ tar xvzf filesql.tar.gz -C filesql
index.php
README
sql_settings.php
tables.sql
```

#### Copying files to correct folder

```
[k8684@lab1.k8684.local Downloads]$ sudo cp -a filesql/ /var/www/html/
[sudo] password for k8684:
```

#### Modifying context of files

```
[k8684@lab1.k8684.local html]$ matchpathcon -V /var/www/html/*
/var/www/html/index.php has context unconfined_u:object_r:user_home_t:s0, should be system_u:object_r:htpd_sys_content_t:s0
/var/www/html/phpinfo verified.
/var/www/html/README has context unconfined_u:object_r:user_home_t:s0, should be system_u:object_r:htpd_sys_content_t:s0
/var/www/html/sql_settings.php has context unconfined_u:object_r:user_home_t:s0, should be system_u:object_r:htpd_sys_content_t:s0
/var/www/html/tables.sql has context unconfined_u:object_r:user_home_t:s0, should be system_u:object_r:htpd_sys_content_t:s0
[k8684@lab1.k8684.local html]$ restorecon -v index.php
restorecon reset /var/www/html/index.php context unconfined_u:object_r:user_home_t:s0->unconfined_u:object_r:htpd_sys_content_t:s0
[k8684@lab1.k8684.local html]$ restorecon -v sql_settings.php
restorecon reset /var/www/html/sql_settings.php context unconfined_u:object_r:user_home_t:s0->unconfined_u:object_r:htpd_sys_content_t:s0
[k8684@lab1.k8684.local html]$ restorecon -v tables.sql
restorecon reset /var/www/html/tables.sql context unconfined_u:object_r:user_home_t:s0->unconfined_u:object_r:htpd_sys_content_t:s0
```

```
[k8684@lab1.k8684.local html]$ matchpathcon -V /var/www/html/*
/var/www/html/index.php verified.
/var/www/html/phpinfo verified.
/var/www/html/README has context unconfined_u:object_r:user_home_t:s0, should be system_u:object_r:httpd_sys_content_t:s0
/var/www/html/sql_settings.php verified.
/var/www/html/tables.sql verified.
```

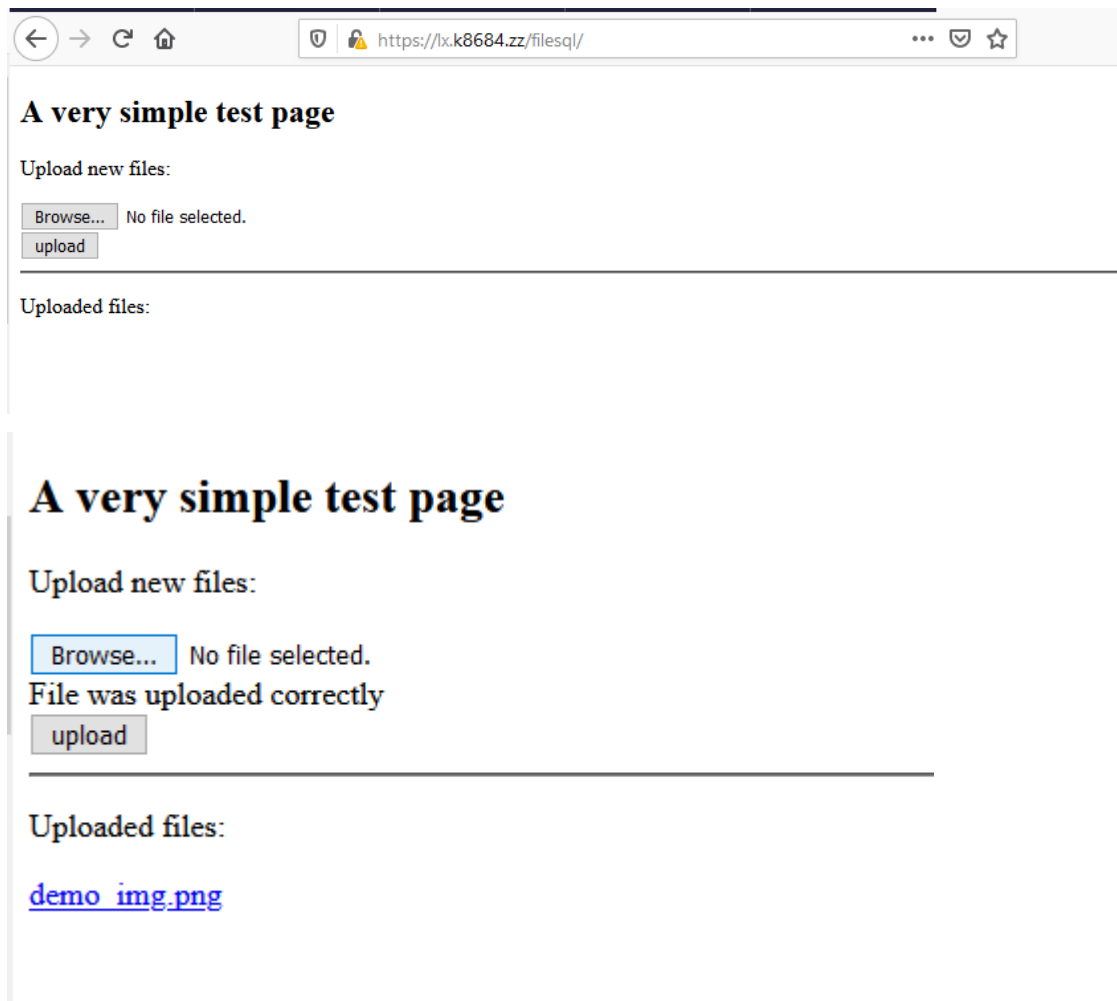
Following README

```
[root@lab1.k8684.local filesql]# mysql -u filesql -p files < tables.sql
Enter password:
```

Giving all permissions and ownerships to apache

```
[root@lab1.k8684.local filesql]# chcon -Rv --type=httpd_sys_rw_content_t /var/www/html/
changing security context of '/var/www/html/phpinfo/index.php'
changing security context of '/var/www/html/phpinfo'
changing security context of '/var/www/html/filesql/index.php'
changing security context of '/var/www/html/filesql/README'
changing security context of '/var/www/html/filesql/tables.sql'
changing security context of '/var/www/html/filesql/files'
changing security context of '/var/www/html/filesql'
changing security context of '/var/www/html/'
[root@lab1.k8684.local filesql]# chown apache:apache -R /var/www/html/
```

Everything works

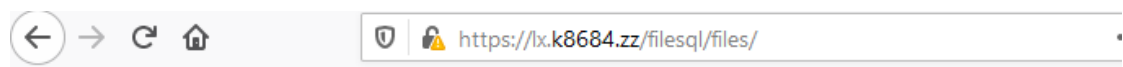


## 4 Access control

Restricting access from anywhere... except localhost and testing

```
<VirtualHost *:443>
    ServerName lx.k8684.zz
    DocumentRoot /var/www/html/
    SSLEngine On
    SSLCertificateFile /etc/pki/tls/certs/localhost.crt
    SSLCertificateKeyFile /etc/pki/tls/private/localhost.key

    <Directory /var/www/html/filesql/files>
        Order Deny,Allow
        Deny from all
        Allow from 127.0.0.1
    </Directory>
</VirtualHost>
```



## Forbidden

You don't have permission to access /filesql/files/ on this server.

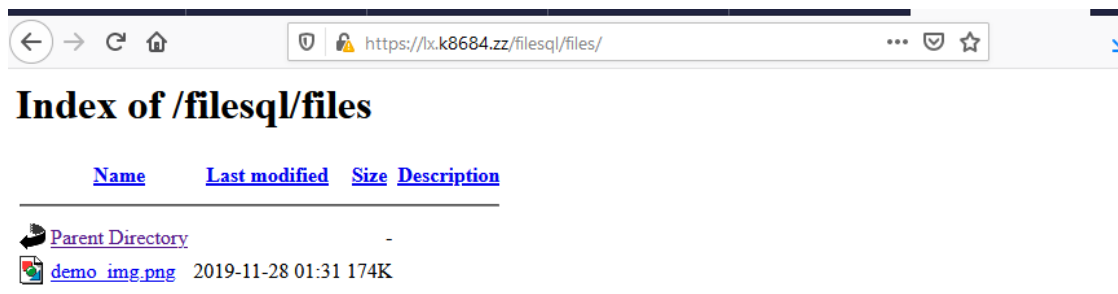
Adding permission to browse from local machine:

```

<VirtualHost *:443>
    ServerName lx.k8684.zz
    DocumentRoot /var/www/html/
    SSLEngine On
    SSLCertificateFile /etc/pki/tls/certs/localhost.crt
    SSLCertificateKeyFile /etc/pki/tls/private/localhost.key

    <Directory /var/www/html/filesql/files>
        Order Deny,Allow
        Deny from all
        Allow from 127.0.0.1
        Allow from 192.168.1.13
    </Directory>
</VirtualHost>

```



## 5 .htaccess

Allowing override for folder

```

</Directory>
<Directory /var/www/html/phpinfo>
    AllowOverride All
</Directory>
</VirtualHost>

```

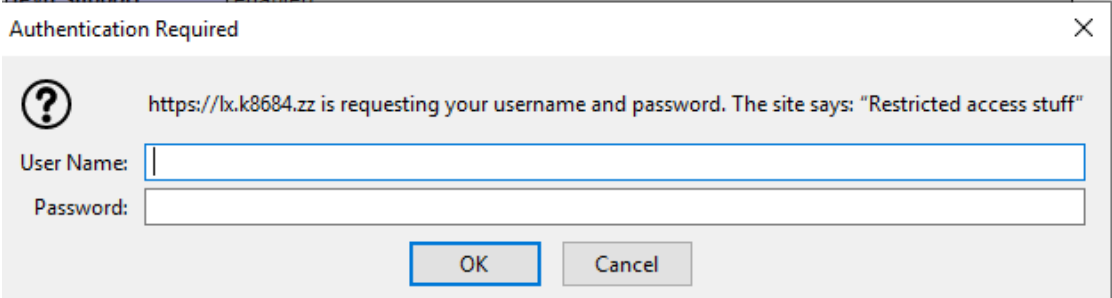
Creating .htaccess file

```
[root@lab1.k8684.local phpinfo]# cat .htaccess
AuthType Basic
AuthName "Restricted access stuff"
AuthUserFile /var/www/html/phpinfo/.htpasswd
require valid-user
```

And generating .htpasswd with following command

```
htpasswd -cm .htpasswd admin
```

```
[root@lab1.k8684.local phpinfo]# cat .htpasswd
sulo:$apr1$PZe361sw$rRJ5nzyMVuN6PZlwf38Wn0
```



The image shows a standard web browser authentication dialog box. The title bar reads "Authentication Required". The main text area contains a question mark icon and the message: "https://lx.k8684.zz is requesting your username and password. The site says: 'Restricted access stuff'". Below this, there are two input fields: "User Name:" and "Password:". At the bottom, there are two buttons: "OK" and "Cancel".