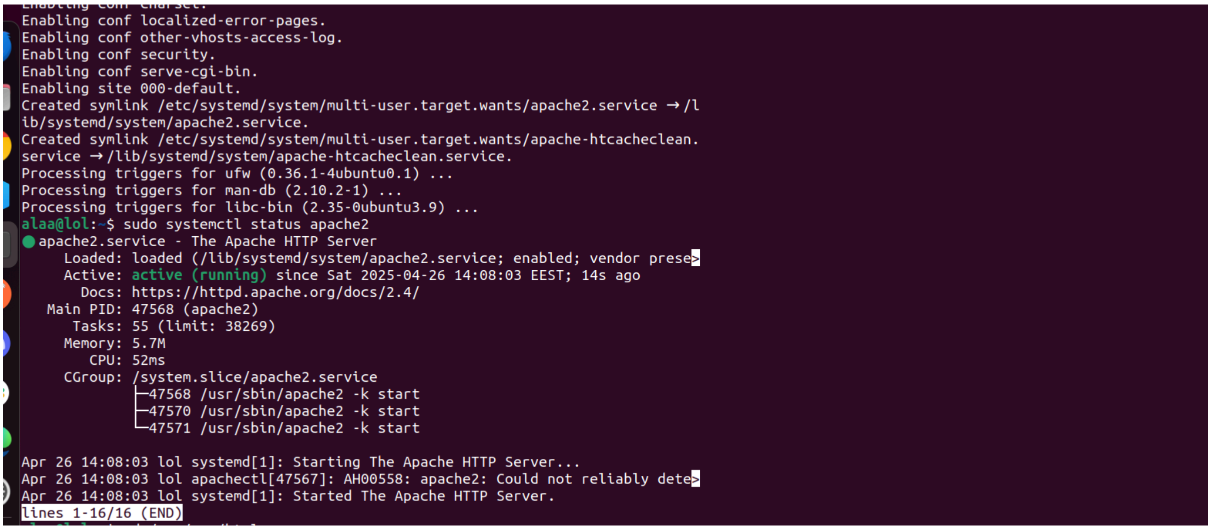
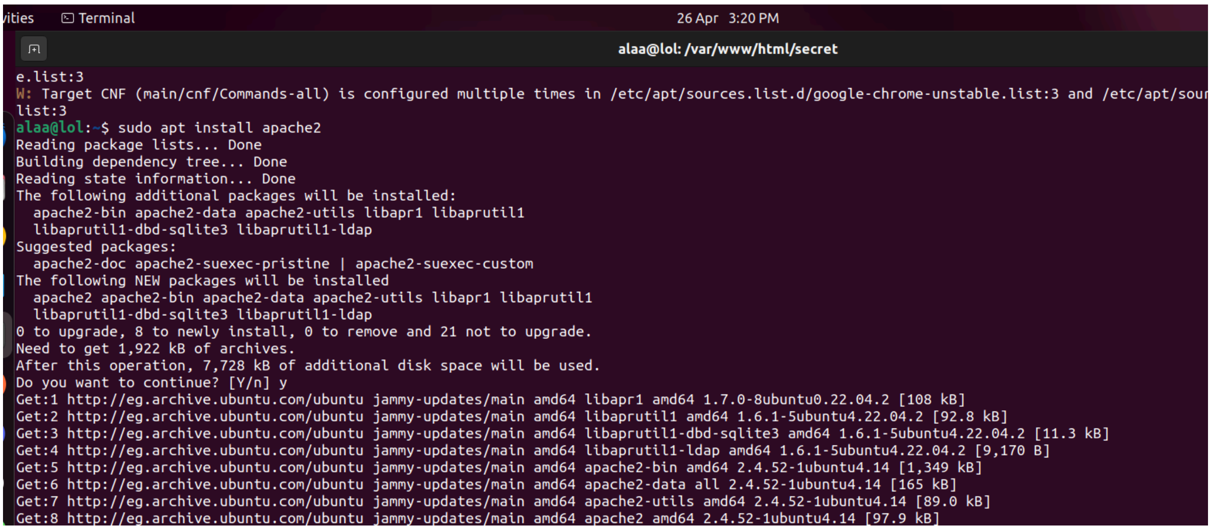
1. Install Apache HTTP server

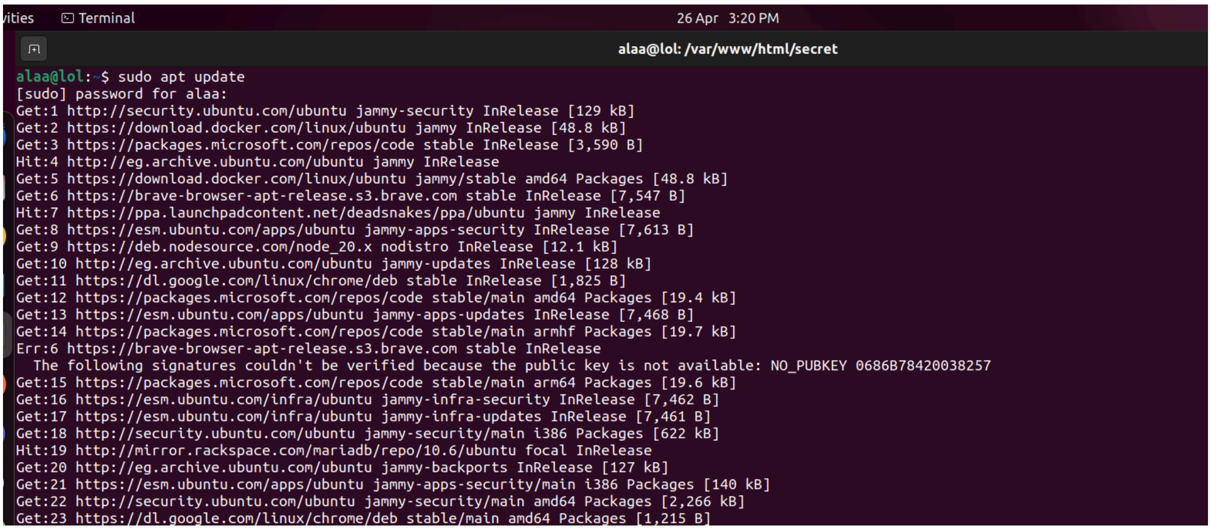
```
sudo apt update

sudo apt install apache2

sudo systemctl status apache2
```



```
Enabling conf charset.
Enabling conf localized-error-pages.
Enabling conf other-vhosts-access-log.
Enabling conf security.
Enabling conf serve-cgi-bin.
Enabling site 000-default.
Created symlink /etc/systemd/system/multi-user.target.wants/apache2.service → /l
ib/systemd/system/apache2.service.
Created symlink /etc/systemd/system/multi-user.target.wants/apache-htcacheclean.
service → /lib/systemd/system/apache-htcacheclean.service.
Processing triggers for ufw (0.36.1-4ubuntu0.1) ...
Processing triggers for man-db (2.10.2-1) ...
Processing triggers for libc-bin (2.35-0ubuntu3.9) ...
alaa@lol:~$ sudo systemctl status apache2
● apache2.service - The Apache HTTP Server
     Loaded: loaded (/lib/systemd/system/apache2.service; enabled; vendor prese>
     Active: active (running) since Sat 2025-04-26 14:08:03 EEST; 14s ago
       Docs: https://httpd.apache.org/docs/2.4/
   Main PID: 47568 (apache2)
      Tasks: 55 (limit: 38269)
     Memory: 5.7M
        CPU: 52ms
     CGroup: /system.slice/apache2.service
             ├─47568 /usr/sbin/apache2 -k start
             ├─47570 /usr/sbin/apache2 -k start
             └─47571 /usr/sbin/apache2 -k start

Apr 26 14:08:03 lol systemd[1]: Starting The Apache HTTP Server...
Apr 26 14:08:03 lol apachectl[47567]: AH00558: apache2: Could not reliably dete>
Apr 26 14:08:03 lol systemd[1]: Started The Apache HTTP Server.
lines 1-16/16 (END)
```



```
e.list:3
W: Target CNF (main/cnf/Commands-all) is configured multiple times in /etc/apt/sources.list.d/google-chrome-unstable.list:3 and /etc/apt/sour
list:3
alaa@lol:~$ sudo apt install apache2
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  apache2-bin apache2-data apache2-utils libapr1 libaprutil1
  libaprutil1-dbd-sqlite3 libaprutil1-ldap
Suggested packages:
  apache2-doc apache2-suexec-pristine | apache2-suexec-custom
The following NEW packages will be installed
  apache2 apache2-bin apache2-data apache2-utils libapr1 libaprutil1
  libaprutil1-dbd-sqlite3 libaprutil1-ldap
0 to upgrade, 8 to newly install, 0 to remove and 21 not to upgrade.
Need to get 1,922 kB of archives.
After this operation, 7,728 kB of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://eg.archive.ubuntu.com/ubuntu jammy-updates/main amd64 libapr1 amd64 1.7.0-8ubuntu0.22.04.2 [108 kB]
Get:2 http://eg.archive.ubuntu.com/ubuntu jammy-updates/main amd64 libaprutil1 amd64 1.6.1-5ubuntu4.22.04.2 [92.8 kB]
Get:3 http://eg.archive.ubuntu.com/ubuntu jammy-updates/main amd64 libaprutil1-dbd-sqlite3 amd64 1.6.1-5ubuntu4.22.04.2 [11.3 kB]
Get:4 http://eg.archive.ubuntu.com/ubuntu jammy-updates/main amd64 libaprutil1-ldap amd64 1.6.1-5ubuntu4.22.04.2 [9,170 B]
Get:5 http://eg.archive.ubuntu.com/ubuntu jammy-updates/main amd64 apache2-bin amd64 2.4.52-1ubuntu4.14 [1,349 kB]
Get:6 http://eg.archive.ubuntu.com/ubuntu jammy-updates/main amd64 apache2-data all 2.4.52-1ubuntu4.14 [165 kB]
Get:7 http://eg.archive.ubuntu.com/ubuntu jammy-updates/main amd64 apache2-utils amd64 2.4.52-1ubuntu4.14 [89.0 kB]
Get:8 http://eg.archive.ubuntu.com/ubuntu jammy-updates/main amd64 apache2 amd64 2.4.52-1ubuntu4.14 [97.9 kB]
```



```
alaa@lol:~$ sudo apt update
[sudo] password for alaa:
Get:1 http://security.ubuntu.com/ubuntu jammy-security InRelease [129 kB]
Get:2 https://download.docker.com/linux/ubuntu jammy InRelease [48.8 kB]
Get:3 https://packages.microsoft.com/repos/code stable InRelease [3,590 B]
Hit:4 http://eg.archive.ubuntu.com/ubuntu jammy InRelease
Get:5 https://download.docker.com/linux/ubuntu jammy/stable amd64 Packages [48.8 kB]
Get:6 https://brave-browser-apt-release.s3.brave.com stable InRelease [7,547 B]
Hit:7 https://ppa.launchpadcontent.net/deadsnakes/ppa/ubuntu jammy InRelease
Get:8 https://esm.ubuntu.com/apps/ubuntu jammy-apps-security InRelease [7,613 B]
Get:9 https://deb.nodesource.com/node_20.x nodistro InRelease [12.1 kB]
Get:10 http://eg.archive.ubuntu.com/ubuntu jammy-updates InRelease [128 kB]
Get:11 https://dl.google.com/linux/chrome/deb stable InRelease [1,825 B]
Get:12 https://packages.microsoft.com/repos/code stable/main amd64 Packages [19.4 kB]
Get:13 https://esm.ubuntu.com/apps/ubuntu jammy-apps-updates InRelease [7,468 B]
Get:14 https://packages.microsoft.com/repos/code stable/main armhf Packages [19.7 kB]
Err:6 https://brave-browser-apt-release.s3.brave.com stable InRelease
  The following signatures couldn't be verified because the public key is not available: NO_PUBKEY 0686B78420038257
Get:15 https://packages.microsoft.com/repos/code stable/main arm64 Packages [19.6 kB]
Get:16 https://esm.ubuntu.com/infra/ubuntu jammy-infra-security InRelease [7,462 B]
Get:17 https://esm.ubuntu.com/infra/ubuntu jammy-infra-updates InRelease [7,461 B]
Get:18 http://security.ubuntu.com/ubuntu jammy-security/main i386 Packages [622 kB]
Hit:19 http://mirror.rackspace.com/mariadb/repo/10.6/ubuntu focal InRelease
Get:20 http://eg.archive.ubuntu.com/ubuntu jammy-backports InRelease [127 kB]
Get:21 https://esm.ubuntu.com/apps/ubuntu jammy-apps-security/main i386 Packages [140 kB]
Get:22 http://security.ubuntu.com/ubuntu jammy-security/main amd64 Packages [2,266 kB]
Get:23 https://dl.google.com/linux/chrome/deb stable/main amd64 Packages [1,215 B]
```

2. Create two simple html pages named “page1.html, page2.html” then use the suitable
directive to automatically redirect from localhost/page1.html to localhost/page2.html.

cd /var/www/html

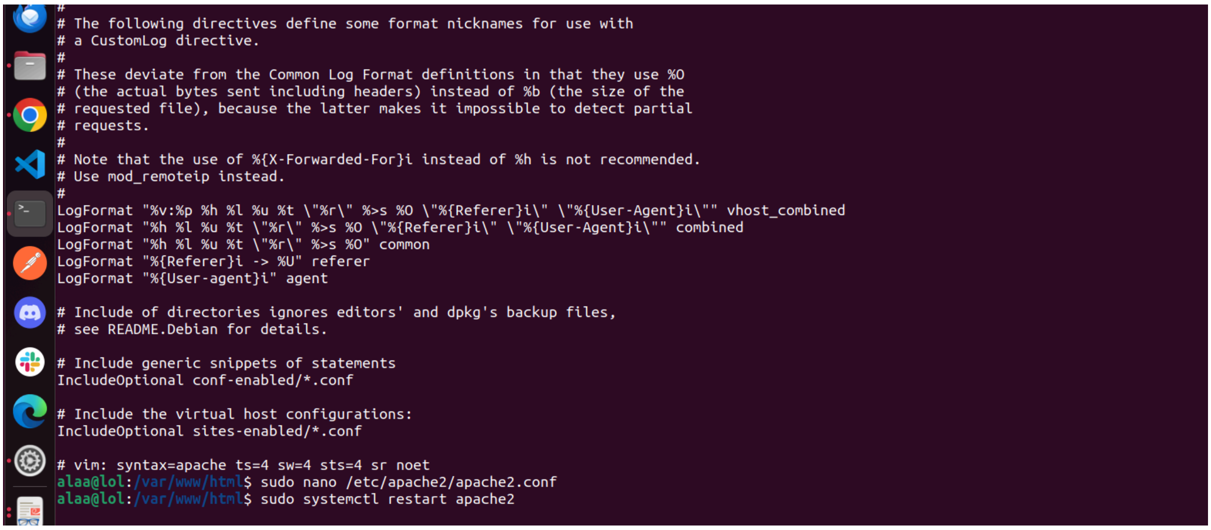
sudo nano page2.html

sudo nano page1.html

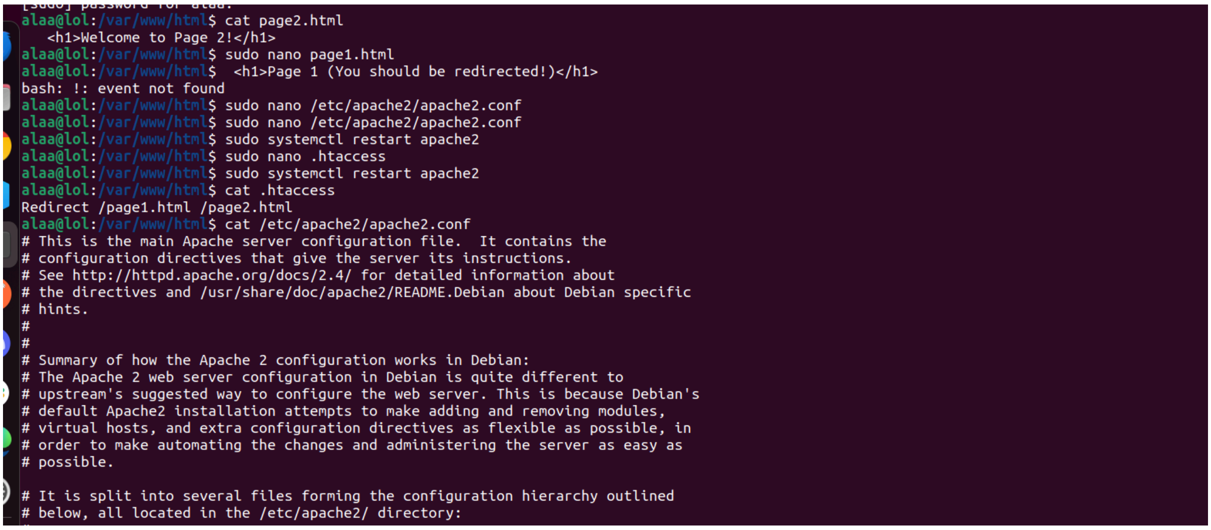
sudo nano /etc/apache2/apache2.conf
sudo systemctl restart apache2

sudo nano .htaccess

Redirect /page1.html /page2.html



```
#
# The following directives define some format nicknames for use with
# a CustomLog directive.
#
# These deviate from the Common Log Format definitions in that they use %O
# (the actual bytes sent including headers) instead of %b (the size of the
# requested file), because the latter makes it impossible to detect partial
# requests.
#
# Note that the use of %{X-Forwarded-For}i instead of %h is not recommended.
# Use mod_remoteip instead.
#
LogFormat "%v:%p %h %l %u %t \"%r\" %>s %O \"%{Referer}i\" \"%{User-Agent}i\"" vhost_combined
LogFormat "%h %l %u %t \"%r\" %>s %O \"%{Referer}i\" \"%{User-Agent}i\"" combined
LogFormat "%h %l %u %t \"%r\" %>s %O" common
LogFormat "%{Referer}i -> %U" referer
LogFormat "%{User-agent}i" agent

# Include of directories ignores editors' and dpkg's backup files,
# see README.Debian for details.

# Include generic snippets of statements
IncludeOptional conf-enabled/*.conf

# Include the virtual host configurations:
IncludeOptional sites-enabled/*.conf

# vim: syntax=apache ts=4 sw=4 sts=4 sr noet
alaa@lol:/var/www/html$ sudo nano /etc/apache2/apache2.conf
alaa@lol:/var/www/html$ sudo systemctl restart apache2
```



```
[sudo] password for alaa:
alaa@lol:/var/www/html$ cat page2.html
   <h1>Welcome to Page 2!</h1>
alaa@lol:/var/www/html$ sudo nano page1.html
alaa@lol:/var/www/html$  <h1>Page 1 (You should be redirected!)</h1>
bash: !: event not found
alaa@lol:/var/www/html$ sudo nano /etc/apache2/apache2.conf
alaa@lol:/var/www/html$ sudo nano /etc/apache2/apache2.conf
alaa@lol:/var/www/html$ sudo systemctl restart apache2
alaa@lol:/var/www/html$ sudo nano .htaccess
alaa@lol:/var/www/html$ sudo systemctl restart apache2
alaa@lol:/var/www/html$ cat .htaccess
Redirect /page1.html /page2.html
alaa@lol:/var/www/html$ cat /etc/apache2/apache2.conf
# This is the main Apache server configuration file.  It contains the
# configuration directives that give the server its instructions.
# See http://httpd.apache.org/docs/2.4/ for detailed information about
# the directives and /usr/share/doc/apache2/README.Debian about Debian specific
# hints.
#
#
# Summary of how the Apache 2 configuration works in Debian:
# The Apache 2 web server configuration in Debian is quite different to
# upstream's suggested way to configure the web server. This is because Debian's
# default Apache2 installation attempts to make adding and removing modules,
# virtual hosts, and extra configuration directives as flexible as possible, in
# order to make automating the changes and administering the server as easy as
# possible.

# It is split into several files forming the configuration hierarchy outlined
# below, all located in the /etc/apache2/ directory:
```

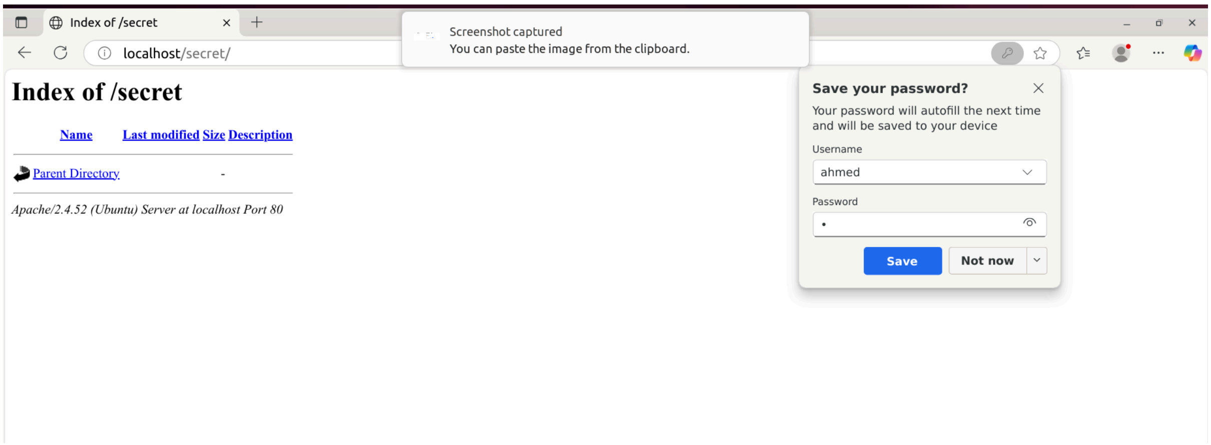
3. Ask for user name and password when accessing a directory

Directory to be protected

```
sudo mkdir /var/www/html/secret

sudo htpasswd -c /etc/apache2/.htpasswd ahmed


cd /var/www/html/secret

sudo nano .htaccess
```

```
AuthType Basic
AuthName "Restricted Access"
AuthUserFile /etc/apache2/.htpasswd
Require valid-user
```

```
http://localhost/secret/
```



Screenshot captured
You can paste the image from the clipboard.

Index of /secret

Name Last modified Size Description

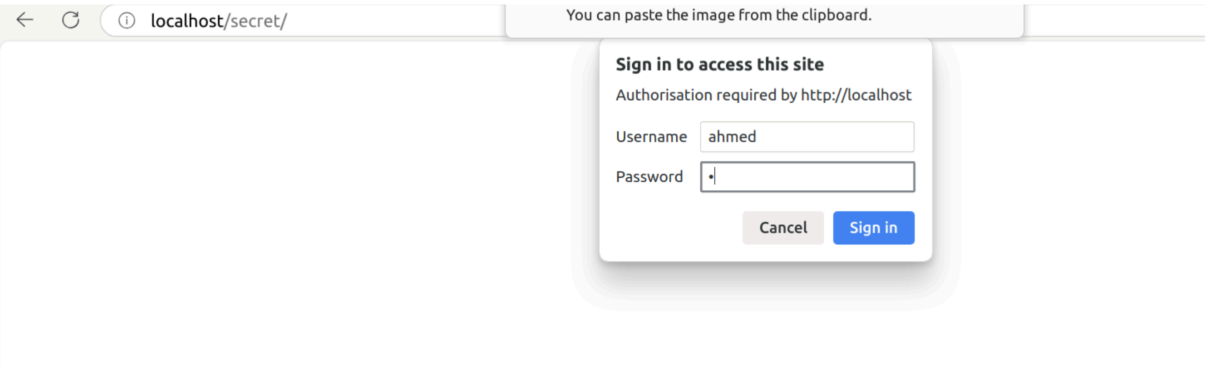
Parent Directory -

Apache/2.4.52 (Ubuntu) Server at localhost Port 80

Save your password?
Your password will autofill the next time and will be saved to your device

Username: ahmed

Password: •

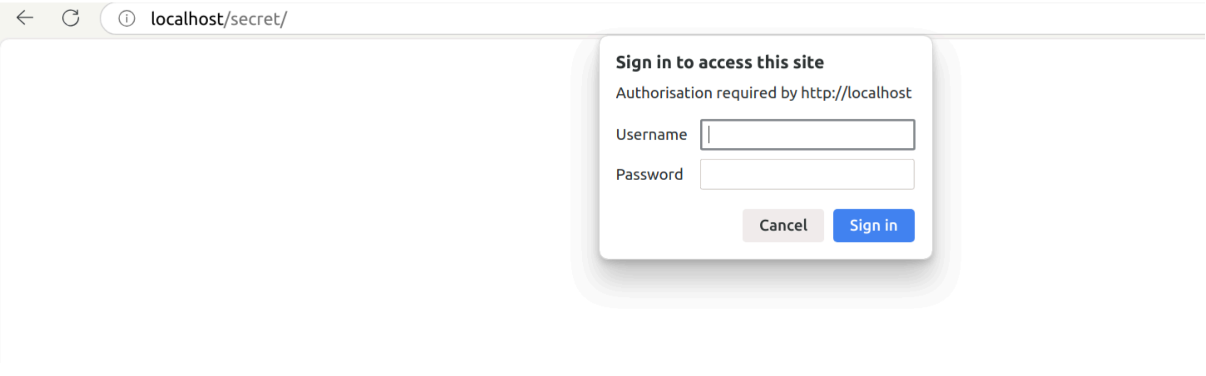


You can paste the image from the clipboard.

Sign in to access this site
Authorisation required by http://localhost

Username: ahmed

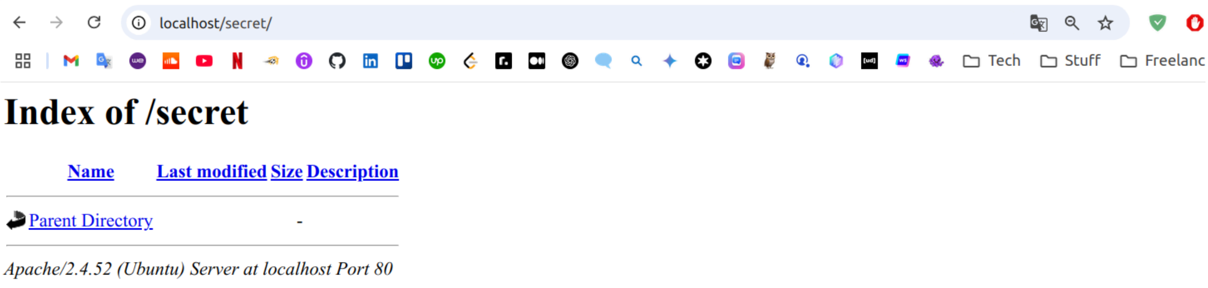
Password: •



Sign in to access this site
Authorisation required by http://localhost

Username:

Password:



Index of /secret

Name Last modified Size Description

Parent Directory -

Apache/2.4.52 (Ubuntu) Server at localhost Port 80

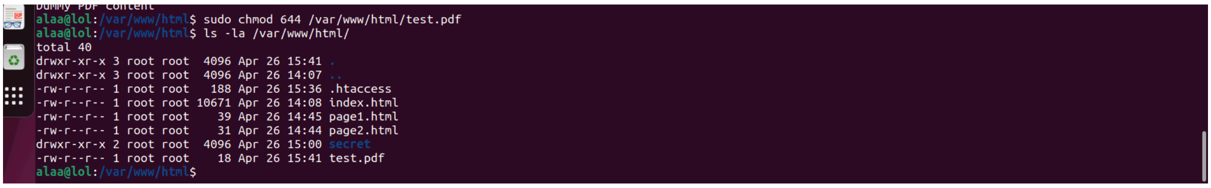
4. Apply authentication before downloading PDF files.

edit `.htaccess`:

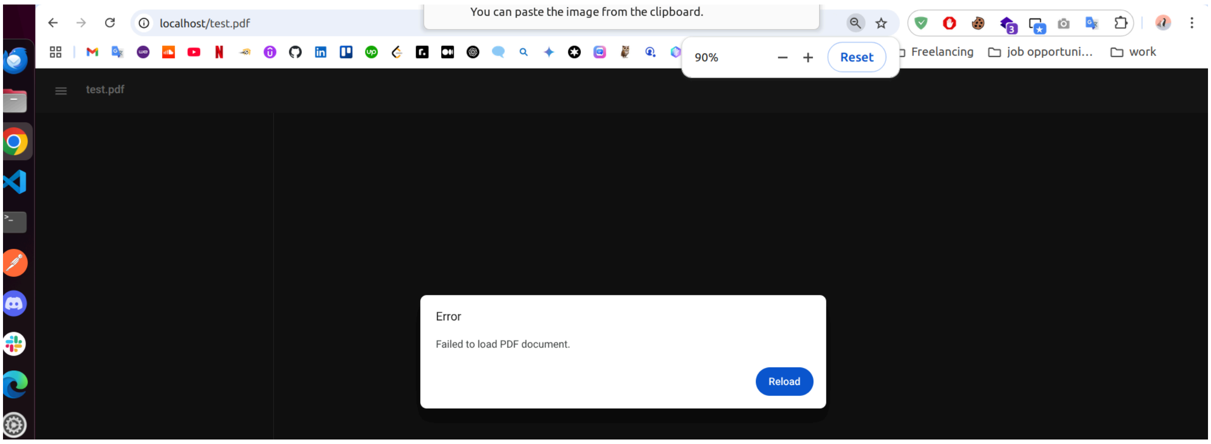
```
sudo nano .htaccess
```

```
<FilesMatch "\.pdf$">
    AuthType Basic
    AuthName "Restricted PDF Access"
    AuthUserFile /etc/apache2/.htpasswd
    Require valid-user
</FilesMatch>
```

Create pdf file



```
Dummy PDF content
alaa@lol:/var/www/html$ sudo chmod 644 /var/www/html/test.pdf
alaa@lol:/var/www/html$ ls -la /var/www/html/
total 40
drwxr-xr-x 3 root root  4096 Apr 26 15:41 .
drwxr-xr-x 3 root root  4096 Apr 26 14:07 ..
-rw-r--r-- 1 root root   188 Apr 26 15:36 .htaccess
-rw-r--r-- 1 root root 10671 Apr 26 14:08 index.html
-rw-r--r-- 1 root root    39 Apr 26 14:45 page1.html
-rw-r--r-- 1 root root    31 Apr 26 14:44 page2.html
drwxr-xr-x 2 root root  4096 Apr 26 15:00 secret
-rw-r--r-- 1 root root    18 Apr 26 15:41 test.pdf
alaa@lol:/var/www/html$
```



You can paste the image from the clipboard.

Error

Failed to load PDF document.

5. Create a directory then allow access to one of your classmates only.

```
sudo mkdir /var/www/html/classmate_only
sudo htpasswd -c /etc/apache2/classmate_passwd ahmed
```

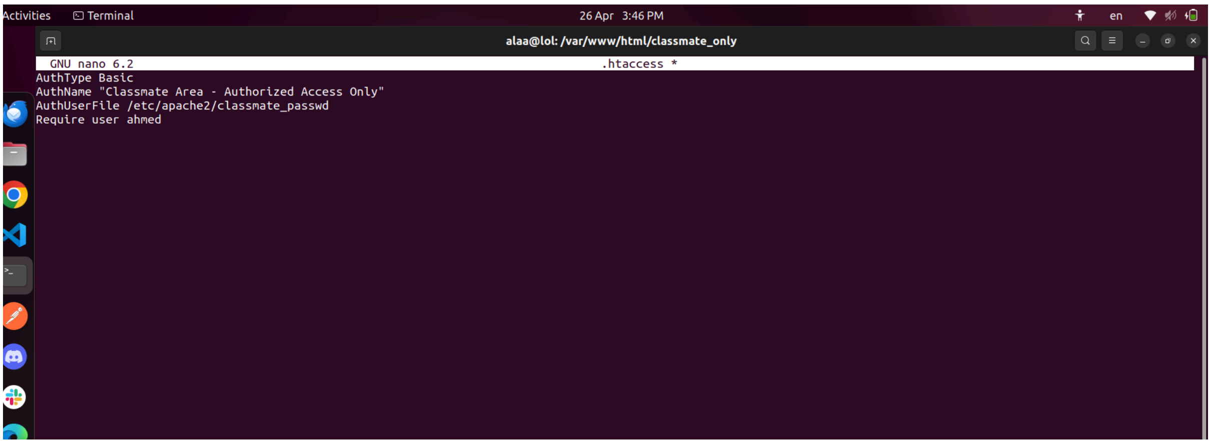
```
cd /var/www/html/classmate_only
```

.htaccess:

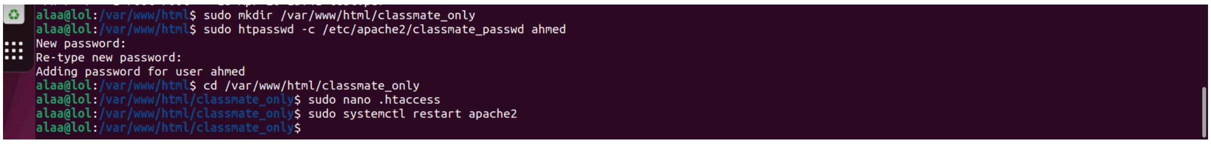
```
sudo nano .htaccess
```

Add to .htaccess

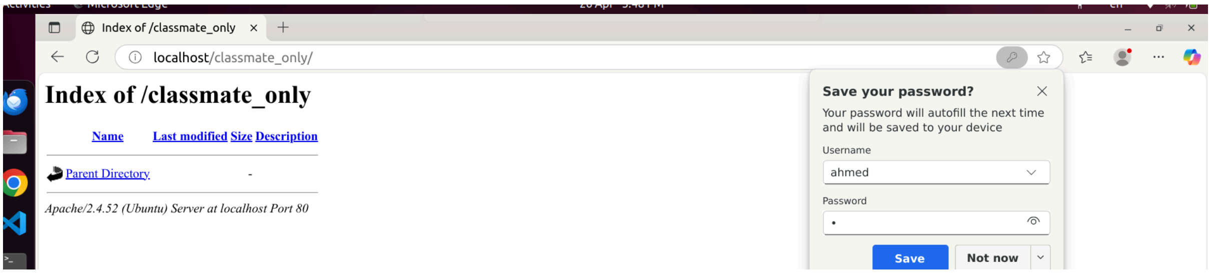
```
AuthType Basic
AuthName "Classmate Area - Authorized Access Only"
AuthUserFile /etc/apache2/classmate_passwd
```



```
  GNU nano 6.2                          .htaccess *
AuthType Basic
AuthName "Classmate Area - Authorized Access Only"
AuthUserFile /etc/apache2/classmate_passwd
Require user ahmed
```



```
alaa@lol:/var/www/html$ sudo mkdir /var/www/html/classmate_only
alaa@lol:/var/www/html$ sudo htpasswd -c /etc/apache2/classmate_passwd ahmed
New password:
Re-type new password:
Adding password for user ahmed
alaa@lol:/var/www/html$ cd /var/www/html/classmate_only
alaa@lol:/var/www/html/classmate_only$ sudo nano .htaccess
alaa@lol:/var/www/html/classmate_only$ sudo systemctl restart apache2
alaa@lol:/var/www/html/classmate_only$
```



Index of /classmate_only

Name	Last modified	Size	Description
Parent Directory		-	

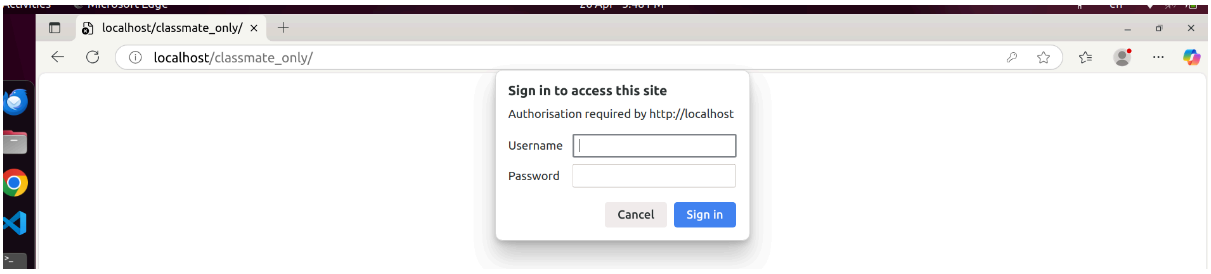
Apache/2.4.52 (Ubuntu) Server at localhost Port 80

Save your password?

Your password will autofill the next time and will be saved to your device

Username: ahmed

Password: •



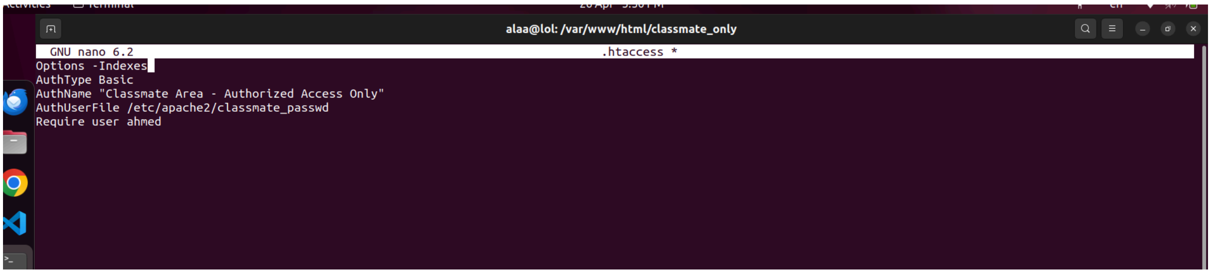
Sign in to access this site

Authorisation required by http://localhost

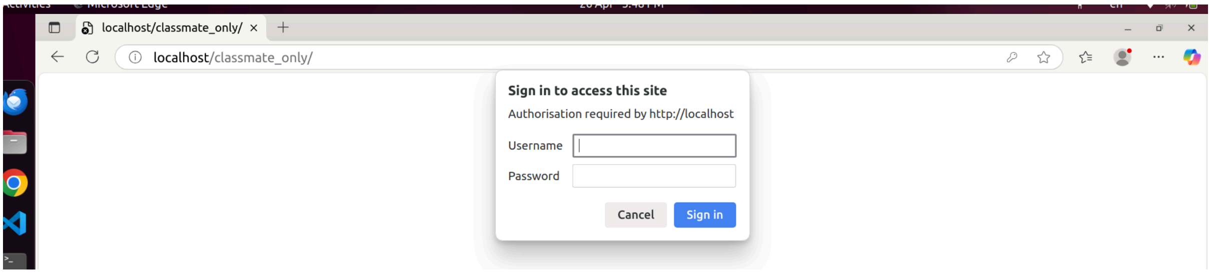
Username

Password

6. Disable listing the directory content (hint use indexs)



```
  GNU nano 6.2                                              .htaccess *
Options -Indexes
AuthType Basic
AuthName "Classmate Area - Authorized Access Only"
AuthUserFile /etc/apache2/classmate_passwd
Require user ahmed
```

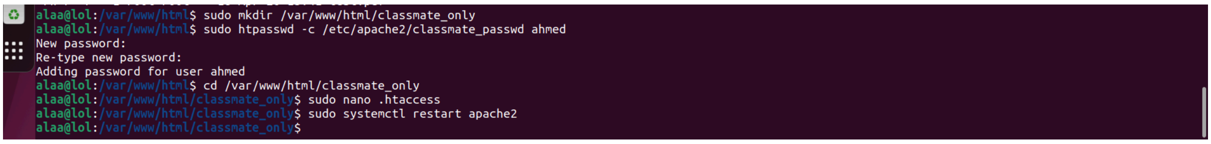


Sign in to access this site

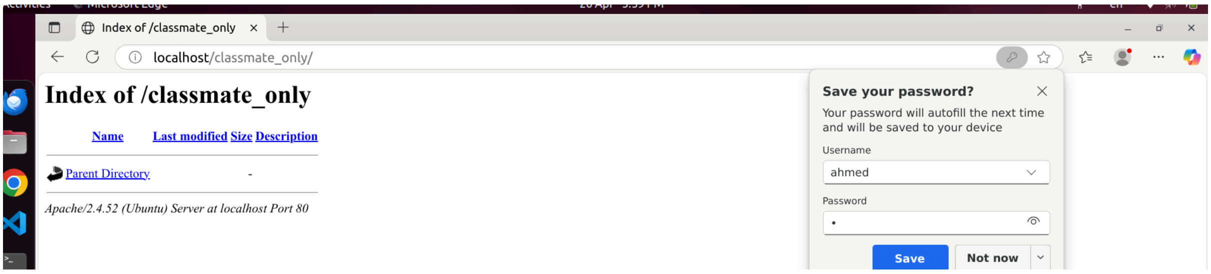
Authorisation required by http://localhost

Username

Password



```
alaa@lol:/var/www/html$ sudo mkdir /var/www/html/classmate_only
alaa@lol:/var/www/html$ sudo htpasswd -c /etc/apache2/classmate_passwd ahmed
New password:
Re-type new password:
Adding password for user ahmed
alaa@lol:/var/www/html$ cd /var/www/html/classmate_only
alaa@lol:/var/www/html/classmate_only$ sudo nano .htaccess
alaa@lol:/var/www/html/classmate_only$ sudo systemctl restart apache2
alaa@lol:/var/www/html/classmate_only$
```



Index of /classmate_only

Name	Last modified	Size	Description
Parent Directory		-	

Apache/2.4.52 (Ubuntu) Server at localhost Port 80

Save your password?

Your password will autofill the next time and will be saved to your device

Username: ahmed

Password: •

7. Change the default index page to be default.html instead of index.html (use DirectoryIndex)

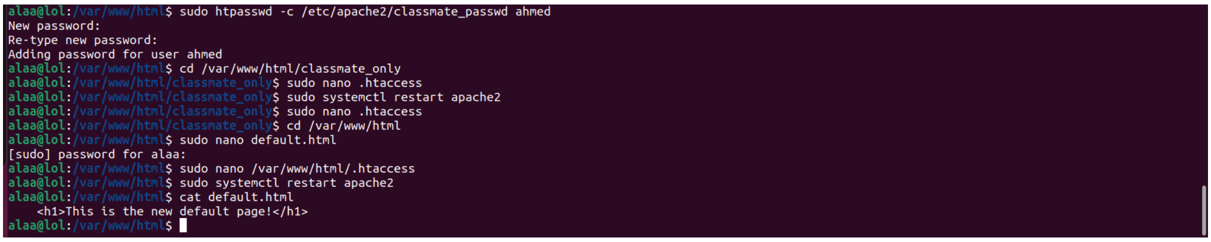
cd /var/www/html

sudo nano default.html

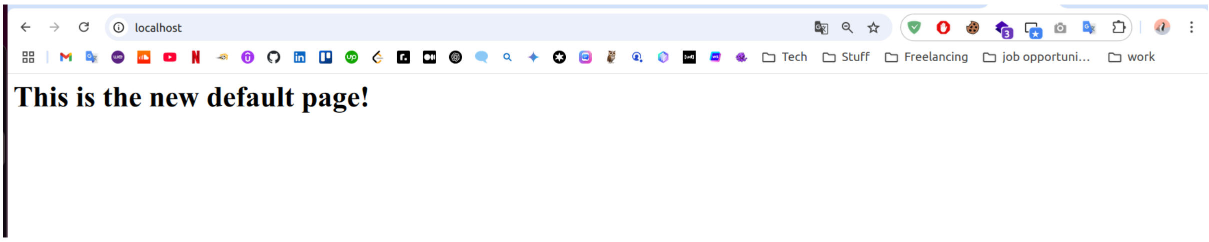
sudo nano /var/www/html/.htaccess
Add the following:
DirectoryIndex default.html

sudo systemctl restart apache2

alaa@lol:/var/www/html$ cat default.html
    <h1>This is the new default page!</h1>



```
alaa@lol:/var/www/html$ sudo htpasswd -c /etc/apache2/classmate_passwd ahmed
New password:
Re-type new password:
Adding password for user ahmed
alaa@lol:/var/www/html$ cd /var/www/html/classmate_only
alaa@lol:/var/www/html/classmate_only$ sudo nano .htaccess
alaa@lol:/var/www/html/classmate_only$ sudo systemctl restart apache2
alaa@lol:/var/www/html/classmate_only$ sudo nano .htaccess
alaa@lol:/var/www/html/classmate_only$ cd /var/www/html
alaa@lol:/var/www/html$ sudo nano default.html
[sudo] password for alaa:
alaa@lol:/var/www/html$ sudo nano /var/www/html/.htaccess
alaa@lol:/var/www/html$ sudo systemctl restart apache2
alaa@lol:/var/www/html$ cat default.html
    <h1>This is the new default page!</h1>
alaa@lol:/var/www/html$ 
```



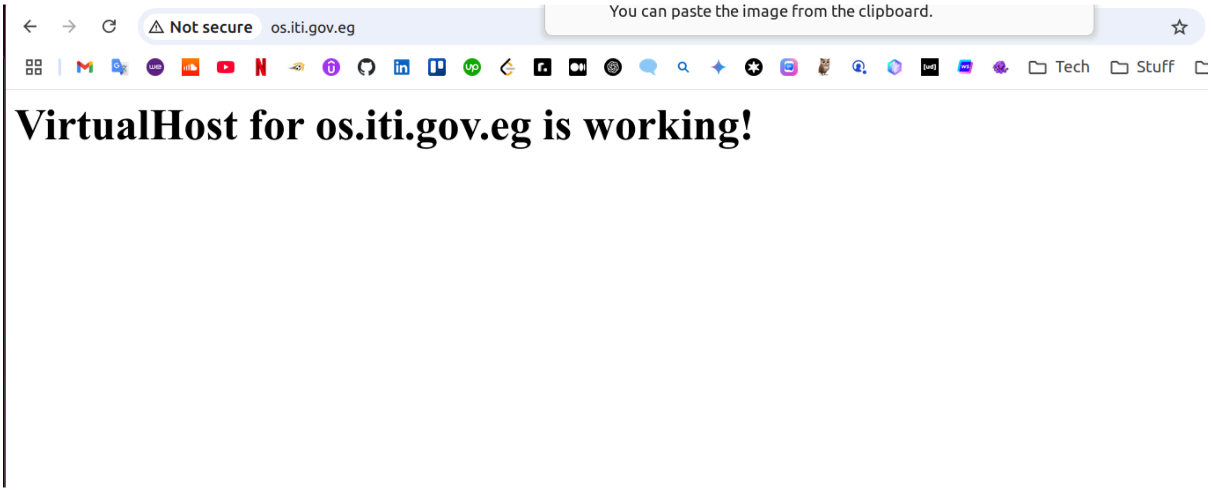
This is the new default page!

8. Create virtualhost for os.iti.gov.eg website

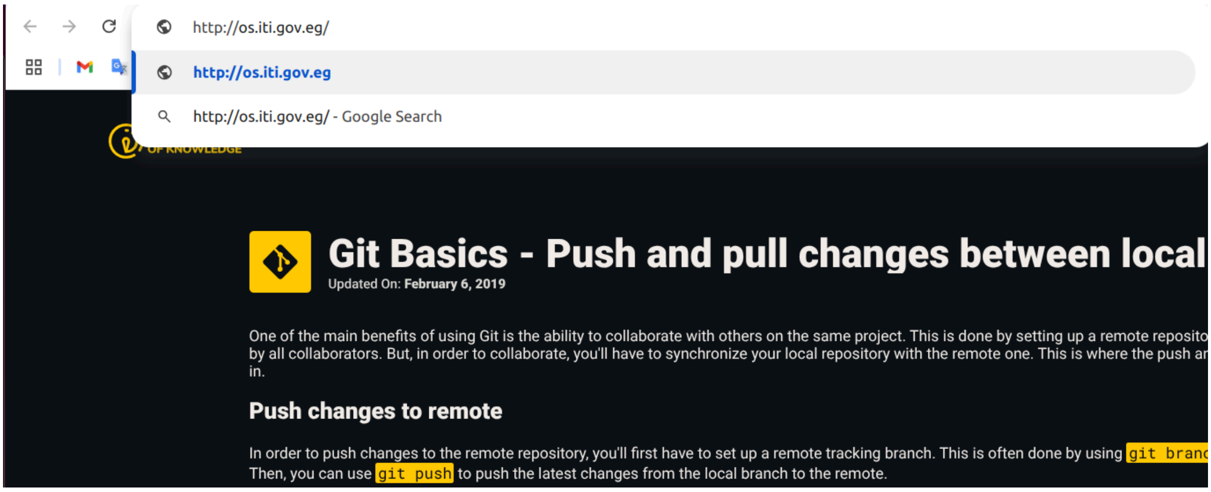
sudo mkdir -p /var/www/os.iti.gov.eg
sudo chown -R www-data:www-data /var/www/os.iti.gov.eg
sudo chmod -R 755 /var/www/os.iti.gov.eg
sudo nano /var/www/os.iti.gov.eg/index.html
sudo nano /etc/apache2/sites-available/os.iti.gov.eg.conf
sudo a2ensite os.iti.gov.eg.conf
Enabling site os.iti.gov.eg.

  systemctl reload apache2
udo systemctl reload apache2
sudo a2ensite os.iti.gov.eg.conf

sudo nano /etc/hosts



VirtualHost for os.iti.gov.eg is working!



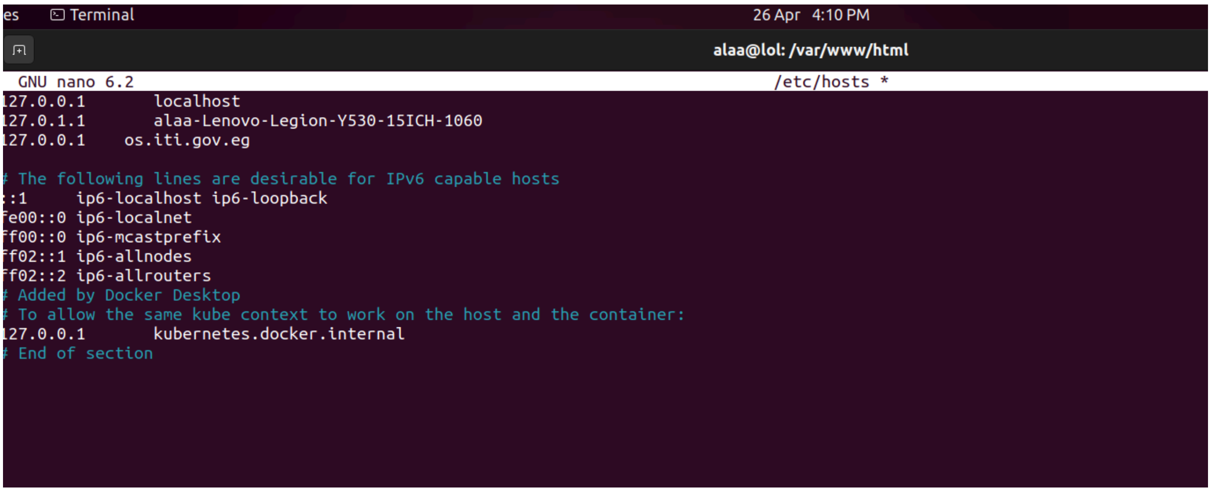
Git Basics - Push and pull changes between local

Updated On: **February 6, 2019**

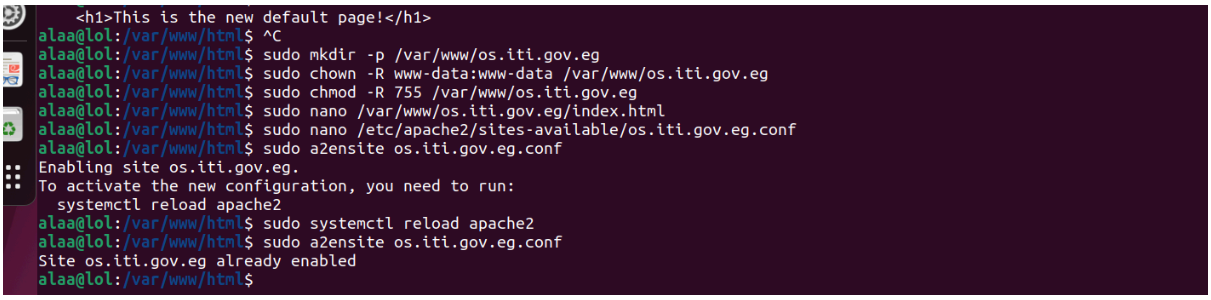
One of the main benefits of using Git is the ability to collaborate with others on the same project. This is done by setting up a remote reposito by all collaborators. But, in order to collaborate, you'll have to synchronize your local repository with the remote one. This is where the push ar in.

Push changes to remote

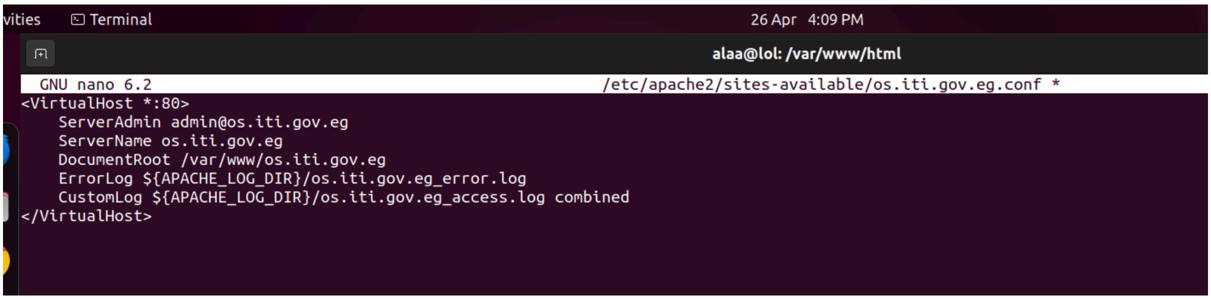
In order to push changes to the remote repository, you'll first have to set up a remote tracking branch. This is often done by using `git branc` Then, you can use `git push` to push the latest changes from the local branch to the remote.



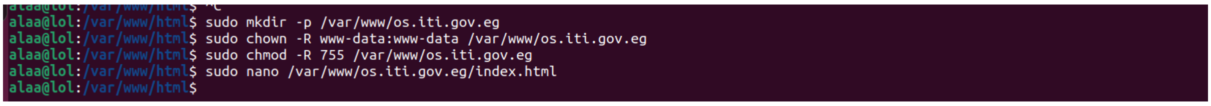
```
  GNU nano 6.2                                                   /etc/hosts *
127.0.0.1       localhost
127.0.1.1       alaa-Lenovo-Legion-Y530-15ICH-1060
127.0.0.1    os.iti.gov.eg

# The following lines are desirable for IPv6 capable hosts
::1     ip6-localhost ip6-loopback
fe00::0 ip6-localnet
ff00::0 ip6-mcastprefix
ff02::1 ip6-allnodes
ff02::2 ip6-allrouters
# Added by Docker Desktop
# To allow the same kube context to work on the host and the container:
127.0.0.1       kubernetes.docker.internal
# End of section
```



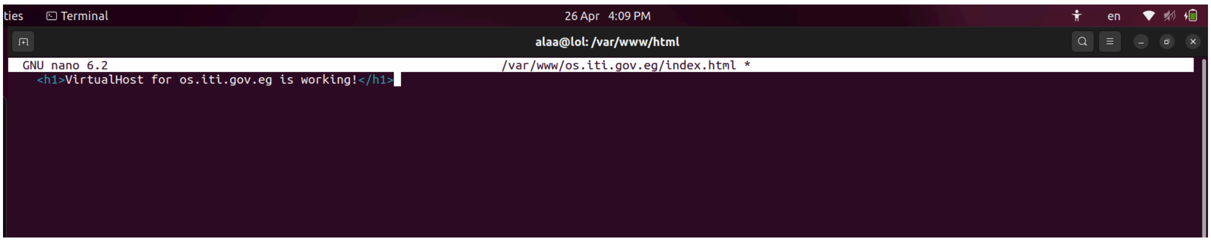
```
    <h1>This is the new default page!</h1>
alaa@lol:/var/www/html$ ^C
alaa@lol:/var/www/html$ sudo mkdir -p /var/www/os.iti.gov.eg
alaa@lol:/var/www/html$ sudo chown -R www-data:www-data /var/www/os.iti.gov.eg
alaa@lol:/var/www/html$ sudo chmod -R 755 /var/www/os.iti.gov.eg
alaa@lol:/var/www/html$ sudo nano /var/www/os.iti.gov.eg/index.html
alaa@lol:/var/www/html$ sudo nano /etc/apache2/sites-available/os.iti.gov.eg.conf
alaa@lol:/var/www/html$ sudo a2ensite os.iti.gov.eg.conf
Enabling site os.iti.gov.eg.
To activate the new configuration, you need to run:
  systemctl reload apache2
alaa@lol:/var/www/html$ sudo systemctl reload apache2
alaa@lol:/var/www/html$ sudo a2ensite os.iti.gov.eg.conf
Site os.iti.gov.eg already enabled
alaa@lol:/var/www/html$
```



```
  GNU nano 6.2                                              /etc/apache2/sites-available/os.iti.gov.eg.conf *
<VirtualHost *:80>
    ServerAdmin admin@os.iti.gov.eg
    ServerName os.iti.gov.eg
    DocumentRoot /var/www/os.iti.gov.eg
    ErrorLog ${APACHE_LOG_DIR}/os.iti.gov.eg_error.log
    CustomLog ${APACHE_LOG_DIR}/os.iti.gov.eg_access.log combined
</VirtualHost>
```



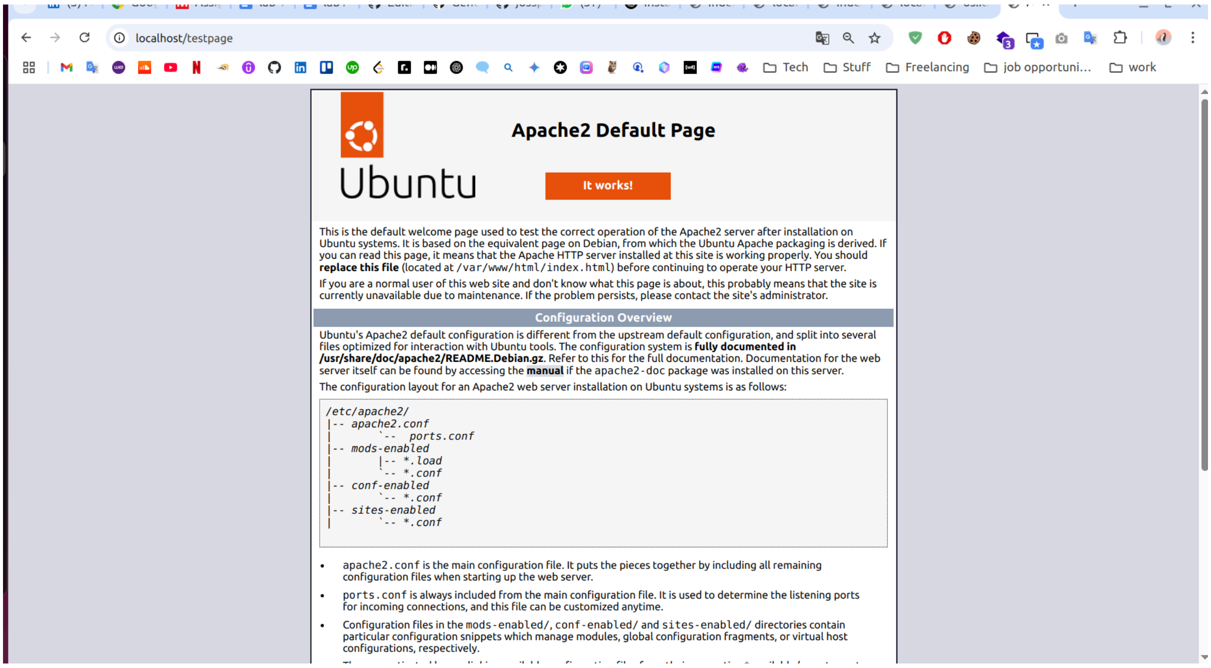
```
alaa@lol:/var/www/html$ ^C
alaa@lol:/var/www/html$ sudo mkdir -p /var/www/os.iti.gov.eg
alaa@lol:/var/www/html$ sudo chown -R www-data:www-data /var/www/os.iti.gov.eg
alaa@lol:/var/www/html$ sudo chmod -R 755 /var/www/os.iti.gov.eg
alaa@lol:/var/www/html$ sudo nano /var/www/os.iti.gov.eg/index.html
alaa@lol:/var/www/html$
```



```
  GNU nano 6.2                                    /var/www/os.iti.gov.eg/index.html *
    <h1>VirtualHost for os.iti.gov.eg is working!</h1>
```

9. Enable rewrite module

sudo a2enmod rewrite
Enabling module rewrite.
To activate the new configuration,
  systemctl restart apache2
sudo systemctl restart apache2
sudo nano /etc/apache2/apache2.conf
sudo systemctl restart apache2
udo nano .htaccess



Apache2 Default Page

This is the default welcome page used to test the correct operation of the Apache2 server after installation on Ubuntu systems. It is based on the equivalent page on Debian, from which the Ubuntu Apache packaging is derived. If you can read this page, it means that the Apache HTTP server installed at this site is working properly. You should **replace this file** (located at `/var/www/html/index.html`) before continuing to operate your HTTP server.

If you are a normal user of this web site and don't know what this page is about, this probably means that the site is currently unavailable due to maintenance. If the problem persists, please contact the site's administrator.

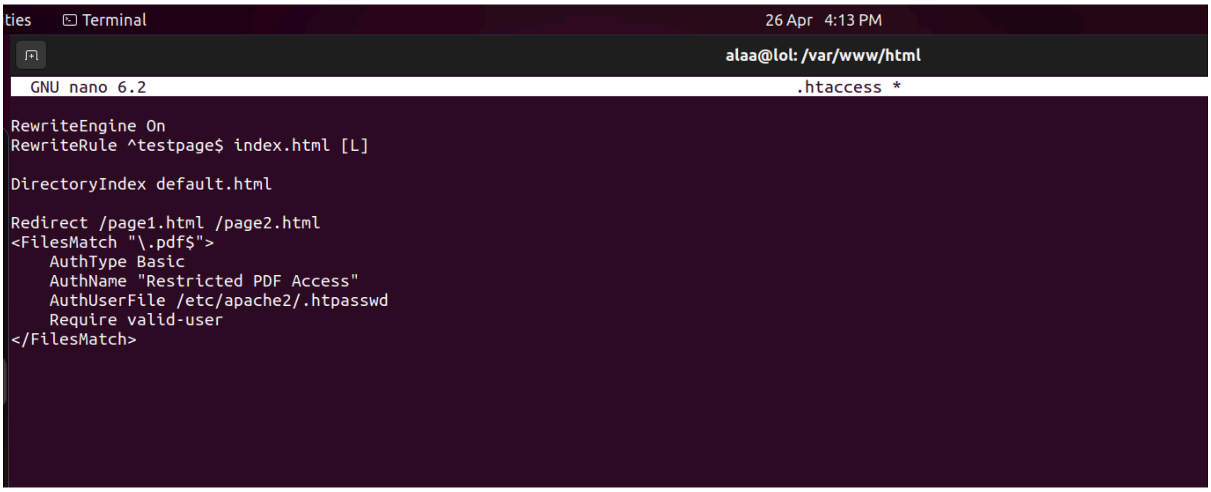
Configuration Overview

Ubuntu's Apache2 default configuration is different from the upstream default configuration, and split into several files optimized for interaction with Ubuntu tools. The configuration system is **fully documented in /usr/share/doc/apache2/README.Debian.gz**. Refer to this for the full documentation. Documentation for the web server itself can be found by accessing the **manual** if the apache2-doc package was installed on this server.

The configuration layout for an Apache2 web server installation on Ubuntu systems is as follows:

```
/etc/apache2/
|-- apache2.conf
|       `--  ports.conf
|-- mods-enabled
|       |-- *.load
|       `-- *.conf
|-- conf-enabled
|       `-- *.conf
|-- sites-enabled
|       `-- *.conf
```

- `apache2.conf` is the main configuration file. It puts the pieces together by including all remaining configuration files when starting up the web server.
- `ports.conf` is always included from the main configuration file. It is used to determine the listening ports for incoming connections, and this file can be customized anytime.
- Configuration files in the `mods-enabled/`, `conf-enabled/` and `sites-enabled/` directories contain particular configuration snippets which manage modules, global configuration fragments, or virtual host configurations, respectively.



```
  GNU nano 6.2                                          .htaccess *

RewriteEngine On
RewriteRule ^testpage$ index.html [L]

DirectoryIndex default.html

Redirect /page1.html /page2.html
<FilesMatch "\.pdf$">
    AuthType Basic
    AuthName "Restricted PDF Access"
    AuthUserFile /etc/apache2/.htpasswd
    Require valid-user
</FilesMatch>
```

10.What is the importance of rewrite module?

Answer:

The Apache rewrite module makes website links cleaner and easier to read. It helps fix broken links, forces secure (HTTPS) connections, and keeps the website organized. It's important for making sites look better, work better, and rank higher on Google.