

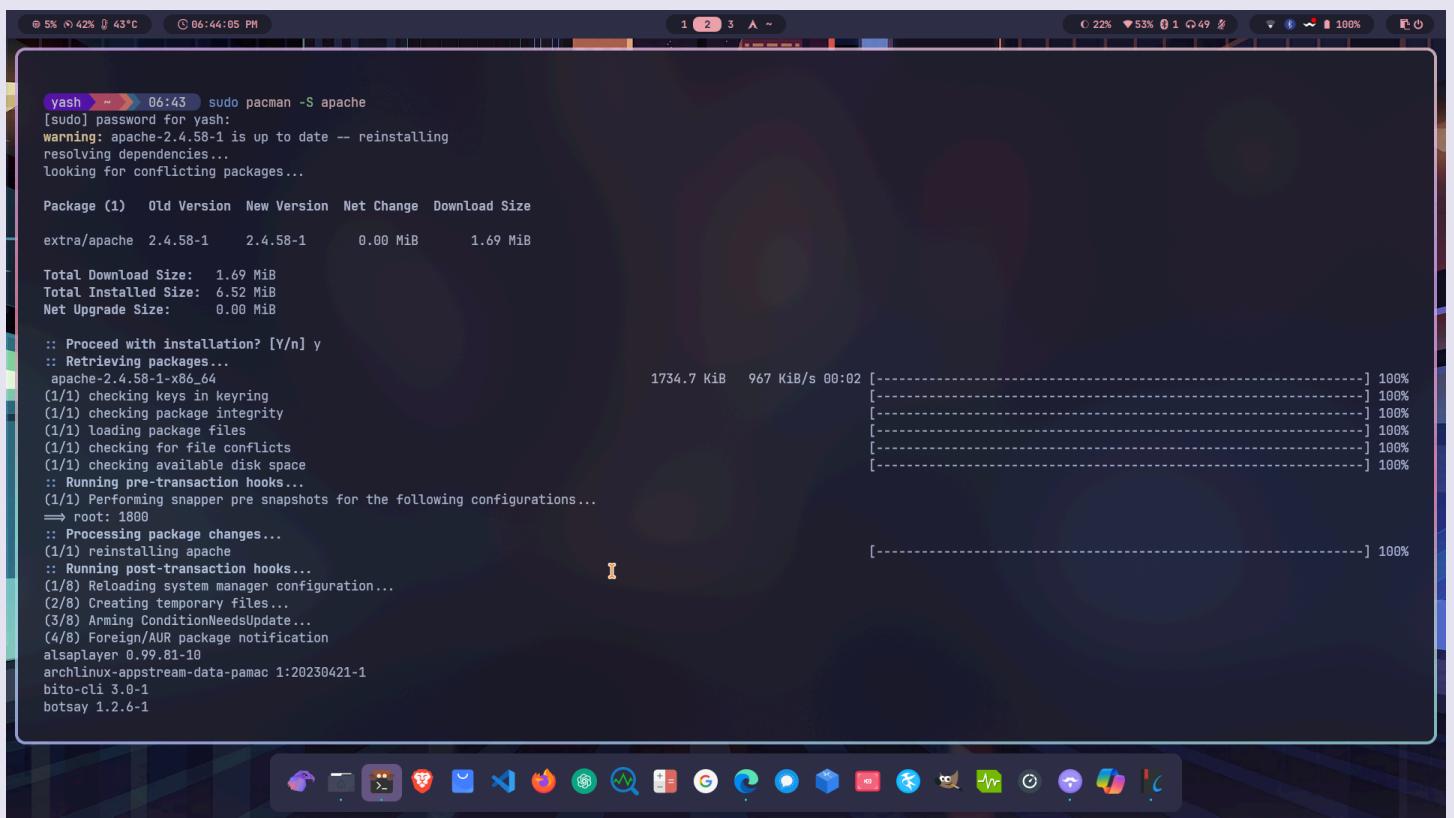
Name - Yash Lakhtariya
Enrollment number - 21162101012
Branch - CBA Batch - 61
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1. Organization Worklock wants to setup a webserver where the details about the employee is stored in the directory (name the directory as your name_enrollementnumber) can be accessed. This details of the directory should be accessible via a virtual host :
http://virtualhost.enrollmentnumber.com/yourname

(i) The webpage should display come content (eg "Employee details")

Steps :

- Install httpd package. (Here, Arch uses pacman package manager for the same)



```
yash ~ 06:43 06:44:05 PM
[sudo] password for yash:
warning: apache-2.4.58-1 is up to date -- reinstalling
resolving dependencies...
looking for conflicting packages...

Package (1) Old Version New Version Net Change Download Size
extra/apache 2.4.58-1 2.4.58-1 0.00 MiB 1.69 MiB

Total Download Size: 1.69 MiB
Total Installed Size: 6.52 MiB
Net Upgrade Size: 0.00 MiB

:: Proceed with installation? [Y/n] y
:: Retrieving packages...
apache-2.4.58-1-x86_64 1734.7 KiB 967 KiB/s 00:02 [-----] 100%
(1/1) checking keys in keyring [-----] 100%
(1/1) checking package integrity [-----] 100%
(1/1) loading package files [-----] 100%
(1/1) checking for file conflicts [-----] 100%
(1/1) checking available disk space [-----] 100%
:: Running pre-transaction hooks...
(1/1) Performing snapper pre snapshots for the following configurations...
=> root: 1800
:: Processing package changes...
(1/1) reinstalling apache [-----] 100%
:: Running post-transaction hooks...
(1/8) Reloading system manager configuration...
(2/8) Creating temporary files...
(3/8) Arming ConditionNeedsUpdate...
(4/8) Foreign/AUR package notification
alsaplayer 0.99.81-10
archlinux-appstream-data-pamac 1:20230421-1
bito-cli 3.0-1
botsay 1.2.6-1
```

Command : **sudo pacman -S apache** (Sync and install the apache package)

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b. Start the httpd service and check the status.

The screenshot shows a terminal window with a dark background and a purple header bar. The terminal window title is 'yash ~ 06:44'. The terminal content is as follows:

```
yash ~ 06:44 systemctl start httpd
yash ~ 06:44 systemctl status httpd
● httpd.service - Apache Web Server
  Loaded: loaded (/usr/lib/systemd/system/httpd.service; disabled; preset: disabled)
  Active: active (running) since Sun 2024-02-18 18:44:30 IST; 6s ago
    Main PID: 83300 (httpd)
      Tasks: 82 (limit: 18281)
     Memory: 168.4M (peak: 170.1M)
       CPU: 329ms
      CGroup: /system.slice/httpd.service
          ├─83300 /usr/bin/httpd -k start -DFOREGROUND
          ├─83324 /usr/bin/httpd -k start -DFOREGROUND
          ├─83326 /usr/bin/httpd -k start -DFOREGROUND
          ├─83329 /usr/bin/httpd -k start -DFOREGROUND

Feb 18 18:44:30 haribol64 systemd[1]: Started Apache Web Server.
Feb 18 18:44:30 haribol64 httpd[83300]: AH00548: NameVirtualHost has no effect and will be removed in the next release /etc/httpd/conf/httpd.conf:545
Feb 18 18:44:30 haribol64 httpd[83300]: AH00558: httpd: Could not reliably determine the server's fully qualified domain name, using 127.0.1.1. Set the 'ServerName' directive globally.

yash ~ 06:44 |
```

The terminal window is positioned over a desktop environment with a dark theme. A dock at the bottom contains various application icons, including a browser, file manager, terminal, and system tools.

Commands :

- **systemctl start httpd**
- **systemctl status httpd**

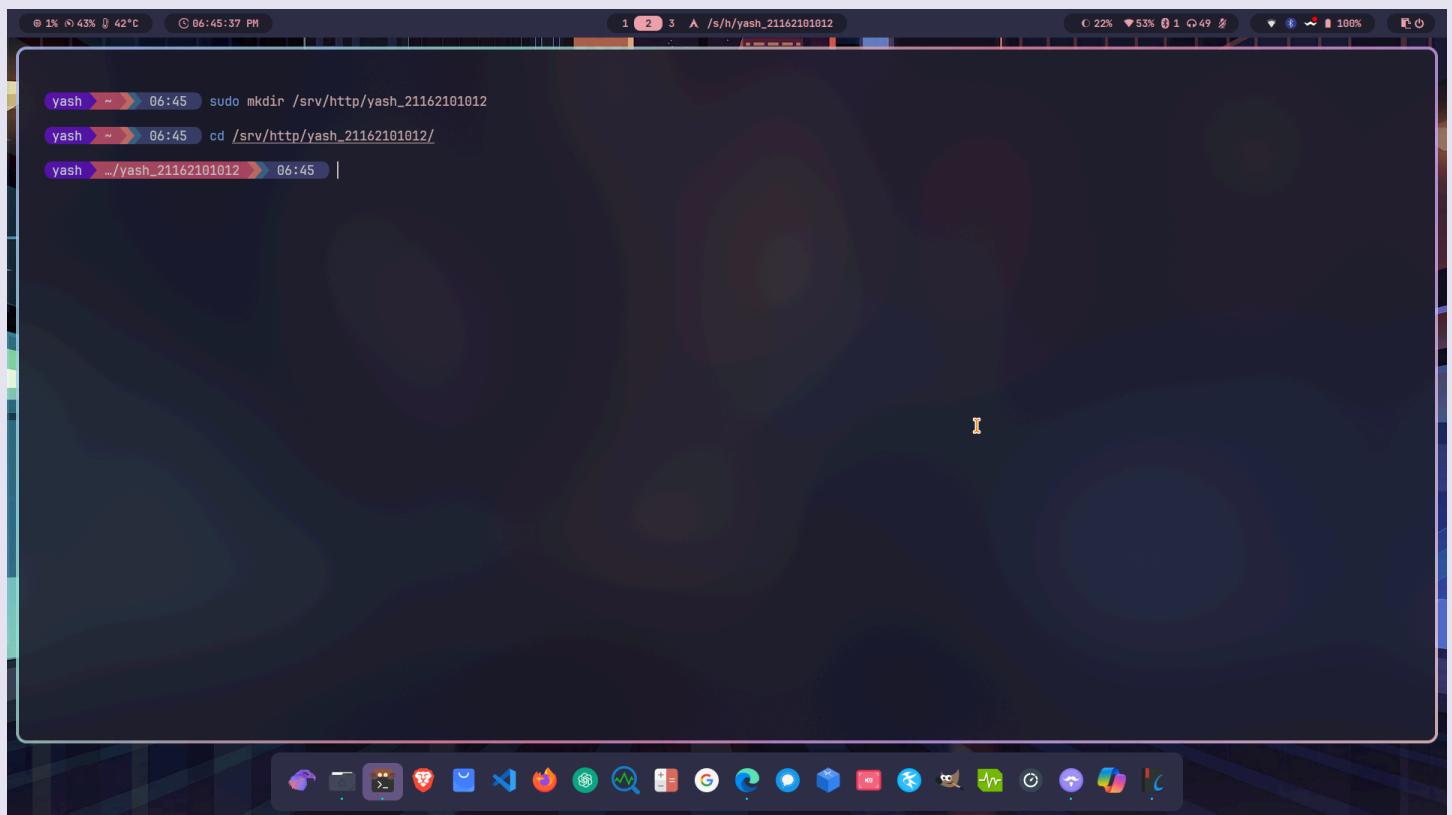
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- c. Create the directory required inside root directory of apache server
(Here, for Arch based systems, it is **/srv/http/**).



The screenshot shows a terminal window with a dark background and light-colored text. At the top, there's a header bar with system status icons like battery level (22%), signal strength, and temperature (42°C). The main terminal area has three command entries:

```
yash ~ 06:45 sudo mkdir /srv/http/yash_21162101012
yash ~ 06:45 cd /srv/http/yash_21162101012/
yash .../yash_21162101012 06:45 |
```

Below the terminal is a dock with various application icons, including a terminal icon, a file manager, a browser, and other system utilities.

Commands :

- **sudo mkdir -p /srv/http/yash_21162101012**
- **cd /srv/http/yash_21162101012/**

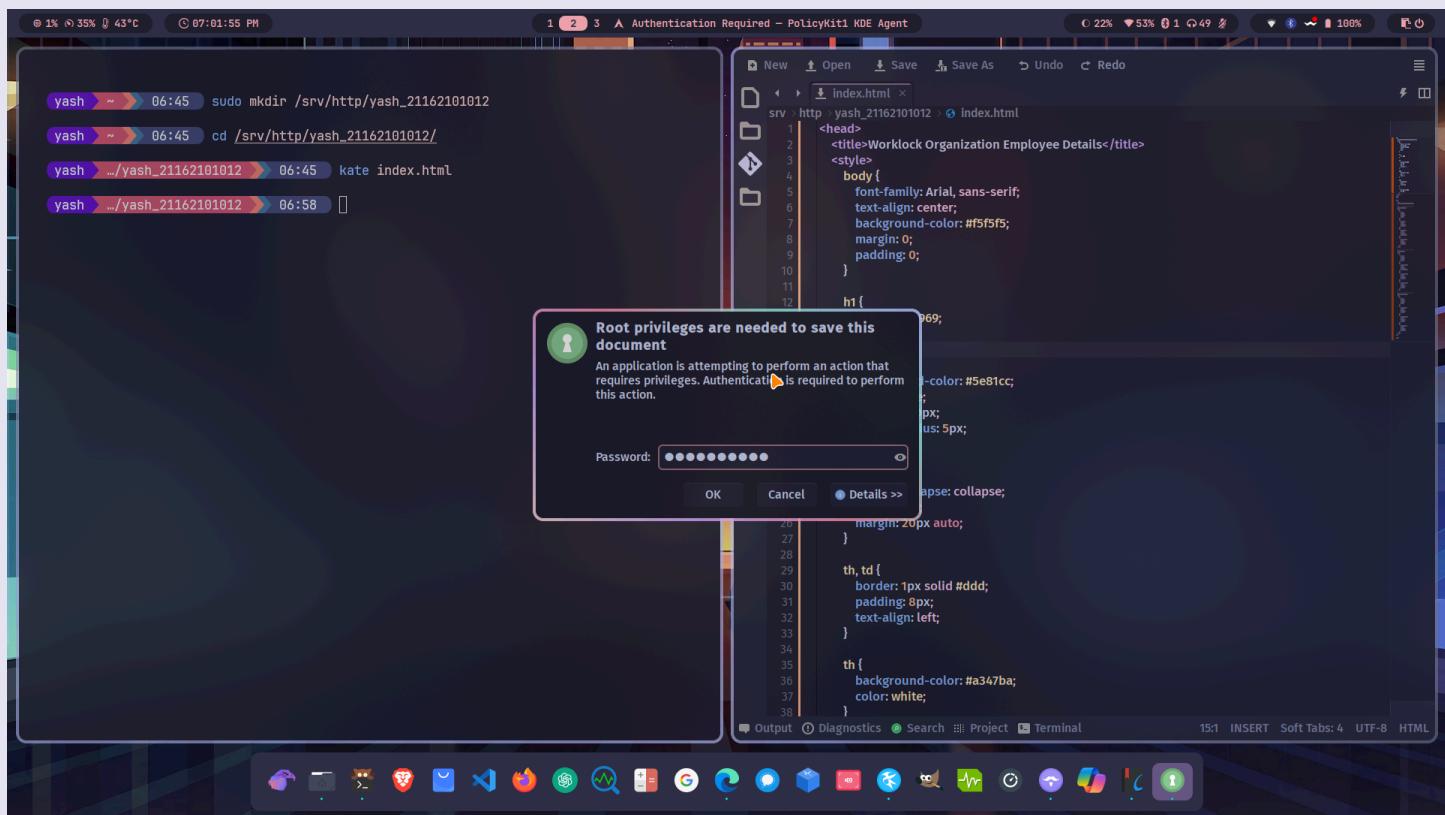
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- d. Create html index file with preferred text editor (kate here) inside the directory just created and save the file.



Code :

```
<head>
  <title>Worklock Organization Employee Details</title>
  <style>
    body {
      font-family: Arial, sans-serif;
      text-align: center;
      background-color: #f5f5f5;
      margin: 0;
      padding: 0;
    }
    h1 {
      color: #5e81cc;
      font-size: 1.5em;
      margin: 0;
    }
    table {
      border-collapse: collapse;
      width: 100%;
    }
    tr {
      border-top: 1px solid #ddd;
      border-bottom: 1px solid #ddd;
    }
    th, td {
      border: 1px solid #ddd;
      padding: 8px;
      text-align: left;
    }
    th {
      background-color: #a347ba;
      color: white;
    }
  </style>
<table>
  <thead>
    <tr>
      <th>Employee ID</th>
      <th>Employee Name</th>
      <th>Position</th>
    </tr>
  </thead>
  <tbody>
    <tr>
      <td>101</td>
      <td>John Doe</td>
      <td>Software Developer</td>
    </tr>
    <tr>
      <td>102</td>
      <td>Jane Smith</td>
      <td>Project Manager</td>
    </tr>
    <tr>
      <td>103</td>
      <td>Mike Johnson</td>
      <td>Data Analyst</td>
    </tr>
    <tr>
      <td>104</td>
      <td>Sarah Lee</td>
      <td>Marketing Specialist</td>
    </tr>
    <tr>
      <td>105</td>
      <td>David Wilson</td>
      <td>Quality Assurance</td>
    </tr>
  </tbody>
</table>
```

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```
h1 {  
    color: #b75969;  
}  
  
h2 {  
    background-color: #5e81cc;  
    color: white;  
    padding: 10px;  
    border-radius: 5px;  
}  
  
table {  
    border-collapse: collapse;  
    width: 80%;  
    margin: 20px auto;  
}  
  
th, td {  
    border: 1px solid #ddd;  
    padding: 8px;  
    text-align: left;  
}  
  
th {  
    background-color: #a347ba;  
    color: white;  
}  
  
```

</style>

</head>

<body>

<div>

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```
<br>
<h1>Worklock Organization Employee Details</h1>

<!-- Department 1 with blue background -->
<h2>Department: Sales</h2>
<table>
  <tr>
    <th>Name</th>
    <th>Number</th>
    <th>Salary</th>
    <th>City</th>
  </tr>
  <tr>
    <td>John Doe</td>
    <td>101</td>
    <td>$50,000</td>
    <td>New York</td>
  </tr>
  <tr>
    <td>Jane Smith</td>
    <td>102</td>
    <td>$45,000</td>
    <td>Los Angeles</td>
  </tr>
  <tr>
    <td>Bob Johnson</td>
    <td>103</td>
    <td>$55,000</td>
    <td>Chicago</td>
  </tr>
</table>

<!-- Department 2 with purple background -->
```

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```
<h2>Department: IT</h2>
<table>
  <tr>
    <th>Name</th>
    <th>Number</th>
    <th>Salary</th>
    <th>City</th>
  </tr>
  <tr>
    <td>Alice Williams</td>
    <td>201</td>
    <td>$60,000</td>
    <td>San Francisco</td>
  </tr>
  <tr>
    <td>Charlie Brown</td>
    <td>202</td>
    <td>$55,000</td>
    <td>Seattle</td>
  </tr>
  <tr>
    <td>Diana Martinez</td>
    <td>203</td>
    <td>$65,000</td>
    <td>Austin</td>
  </tr>
</table>

<!-- Department 3 with blue background -->
<h2>Department: Marketing</h2>
<table>
  <tr>
    <th>Name</th>
```

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```
<th>Number</th>
<th>Salary</th>
<th>City</th>
</tr>
<tr>
    <td>Frank Davis</td>
    <td>301</td>
    <td>$48,000</td>
    <td>Miami</td>
</tr>
<tr>
    <td>Gina Rodriguez</td>
    <td>302</td>
    <td>$42,000</td>
    <td>Denver</td>
</tr>
<tr>
    <td>Harry White</td>
    <td>303</td>
    <td>$50,000</td>
    <td>Atlanta</td>
</tr>
</table>
</div>

</body>
```

Command : **kate index.html**

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- e. Configure the httpd via its config file to host the webpage. Append text containing the current IP address as VirtualHost and its name, the directory as DocumentRoot and virtualhost.21162101012.com as the URL or ServerName of the webpage.

```
yash ~ 07:03 kate /etc/httpd/conf/httpd.conf
yash ~ 07:04

yash ~ 07:07 ip a | grep 'inet' | grep 'wlo1'
    inet 192.168.1.9 brd 192.168.1.255 scope global dynamic noprefixroute wlo1
yash ~ 07:07

httpd.conf
etc httpd conf > httpd.conf
521
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557

# Distributed authoring and versioning (WebDAV)
#Include conf/extra/httpd-dav.conf

# Various default settings
include conf/extra/httpd-default.conf

# Configure mod_proxy_html to understand HTML4/XHTML1
<ifModule proxy_html_module>
    include conf/extra/proxy-html.conf
</ifModule>

# Secure (SSL/TLS) connections
#Include conf/extra/httpd-ssl.conf
#
# Note: The following must be present to support
#       starting without SSL on platforms with no /dev/random equivalent
#       but a statically compiled-in mod_ssl.
#
<ifModule ssl_module>
    SSLRandomSeed startup builtin
    SSLRandomSeed connect builtin
</ifModule>

NameVirtualHost 10.1.157.187
<VirtualHost 10.1.157.187>
    DocumentRoot /srv/http/batch61
    ServerName batch61.com
</VirtualHost>

NameVirtualHost 192.168.1.9
<VirtualHost "192.168.1.9">
    DocumentRoot /srv/http/yash_21162101012/
    ServerName virtualhost.21162101012.com
</VirtualHost>
```

Command : **ip a | grep 'inet' | grep 'wlo1'**

Explanation : 'ip a' gives the output like ifconfig, i.e. details of IP v4 and v6 addresses of all interfaces, and we just need 'inet' i.e. IPv4 address of 'wlo1' i.e. wifi/ethernet interface (of my system), hence grep filters the text output on each pipeline used.

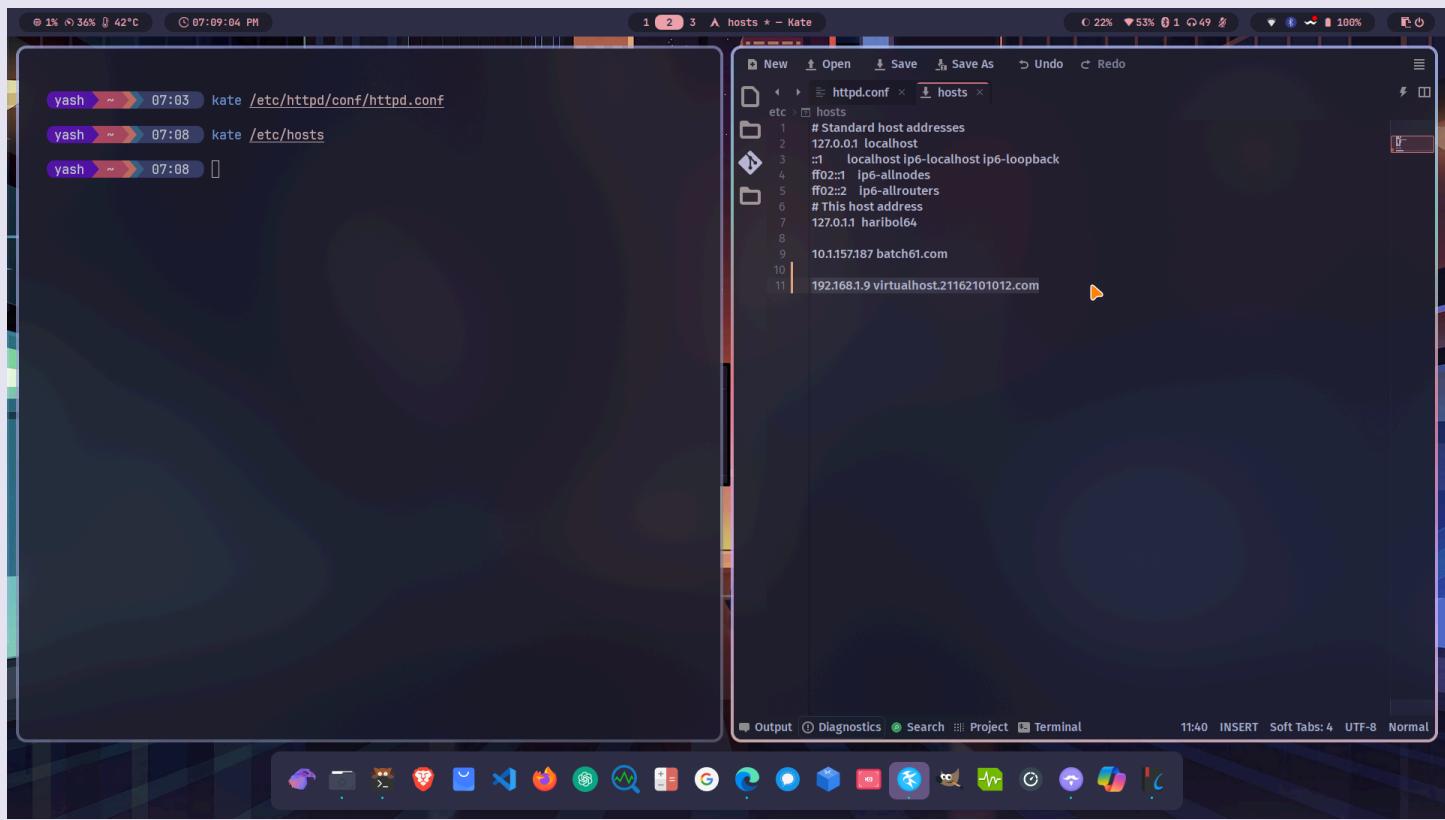
Command : **kate /etc/httpd/conf/httpd.conf** (to edit the httpd.conf file with kate editor)

Text to copy in httpd.conf :

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```
NameVirtualHost 192.168.1.9
<Virtualhost "192.168.1.9">
DocumentRoot /srv/http/yash_21162101012/
ServerName virtualhost.21162101012.com
</Virtualhost>
```

f. Add the ServerName or URL to /etc/hosts file to access it.



Command : **kate /etc/hosts** (to edit hosts file with kate editor)

Text (IP URL) : **192.168.1.9 virtualhost.21162101012.com**

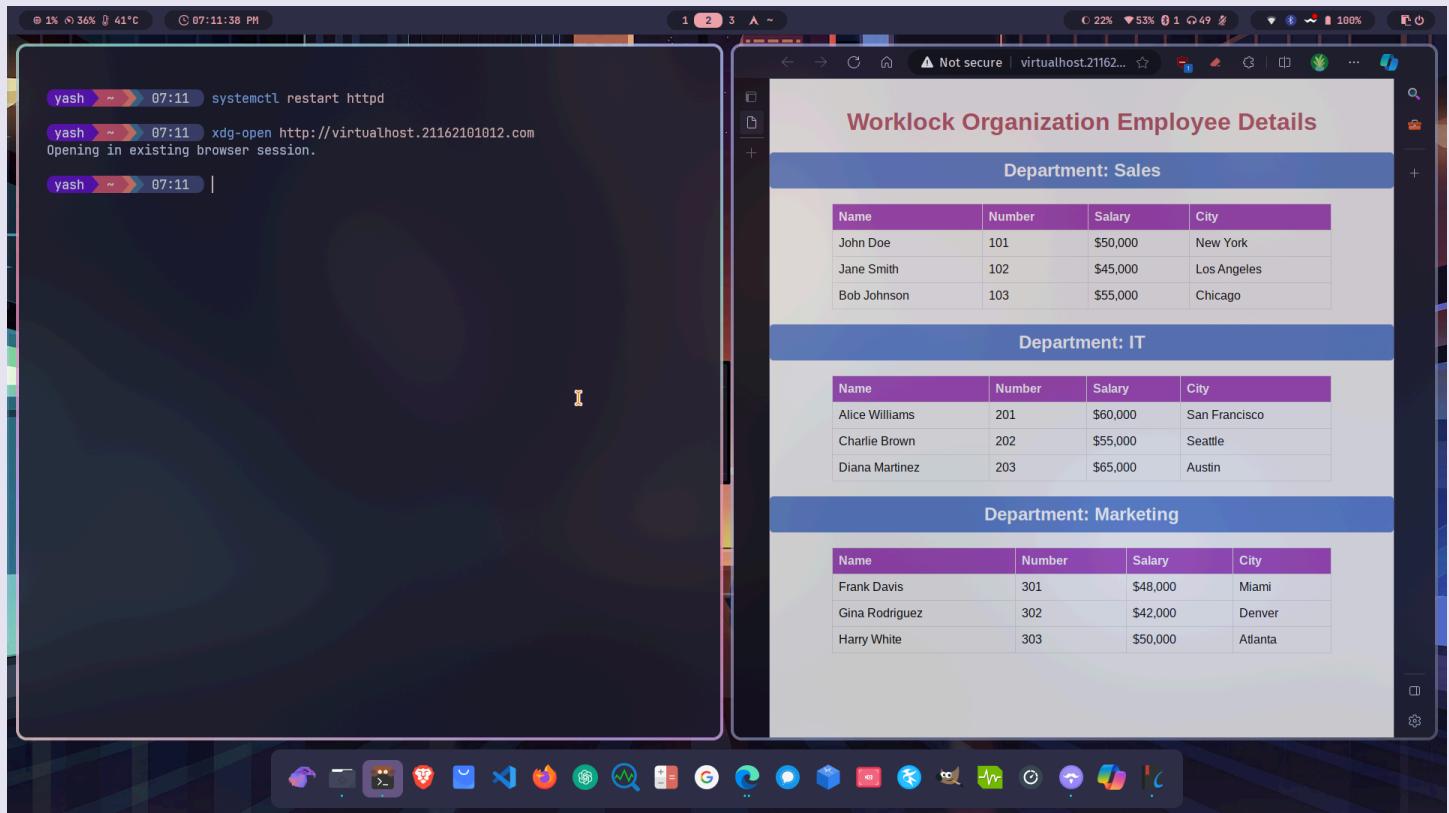
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g. Restart the httpd service and visit the URL directly or via command.



Commands :

- **systemctl restart httpd** (to restart httpd service)
- **xdg-open <http://virtualhost.21162101012.com>**

Explanation of xdg-open : xdg-open is used to open a file or a URL in the user's preferred application in his/her system.

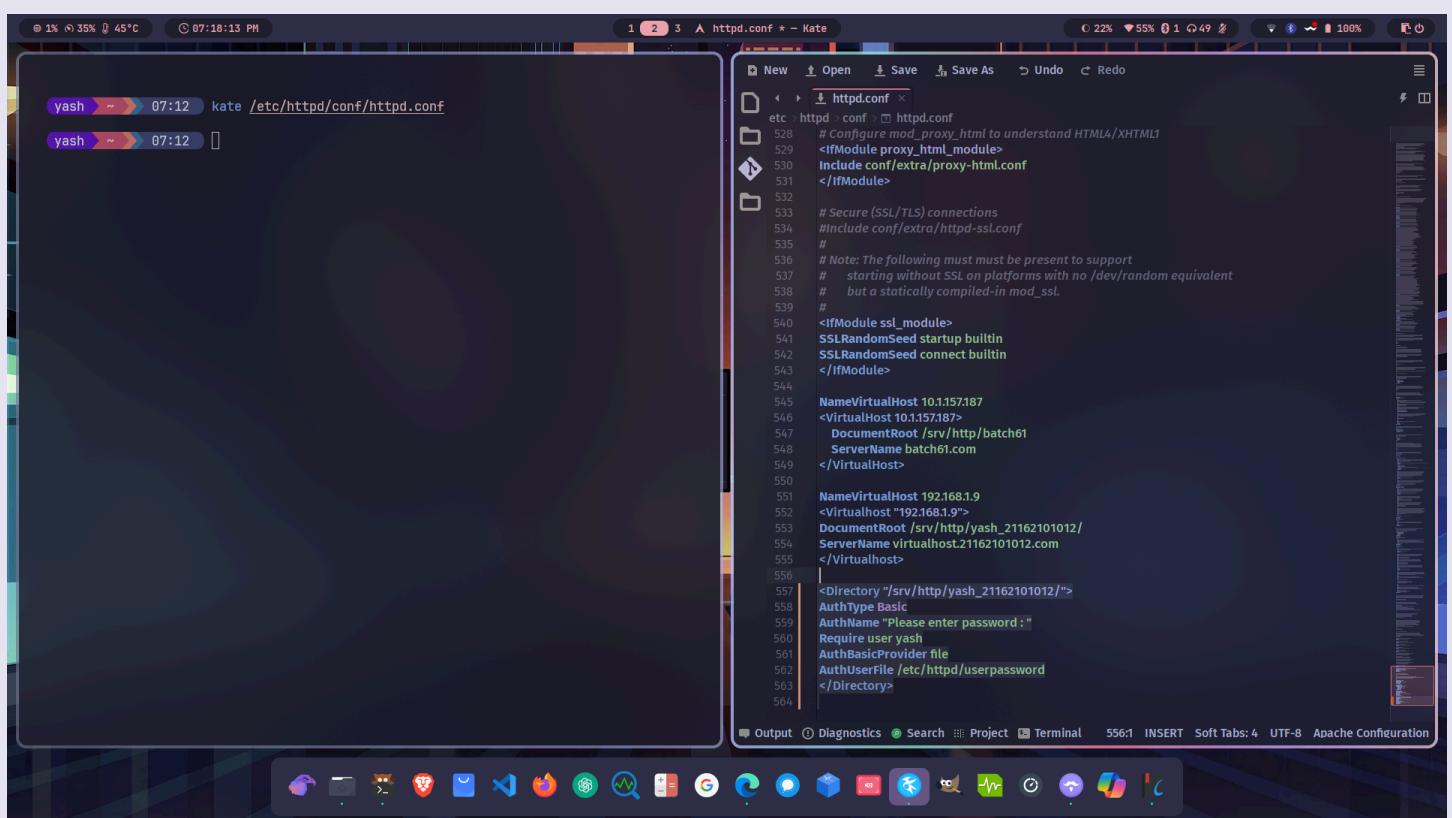
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**(ii) The webpage must be configured for the user-based authentication.
Only user "yourname" should be allowed to login.**

- Configure the virtualhost like previously done in httpd.conf file.

Text to copy (open file via command **kate /etc/httpd/conf/httpd.conf**):

```
<Directory "/srv/http/yash_21162101012/">
AuthType Basic
AuthName "Please enter password : "
Require user yash
AuthBasicProvider file
AuthUserFile /etc/httpd/userpassword
</Directory>
```



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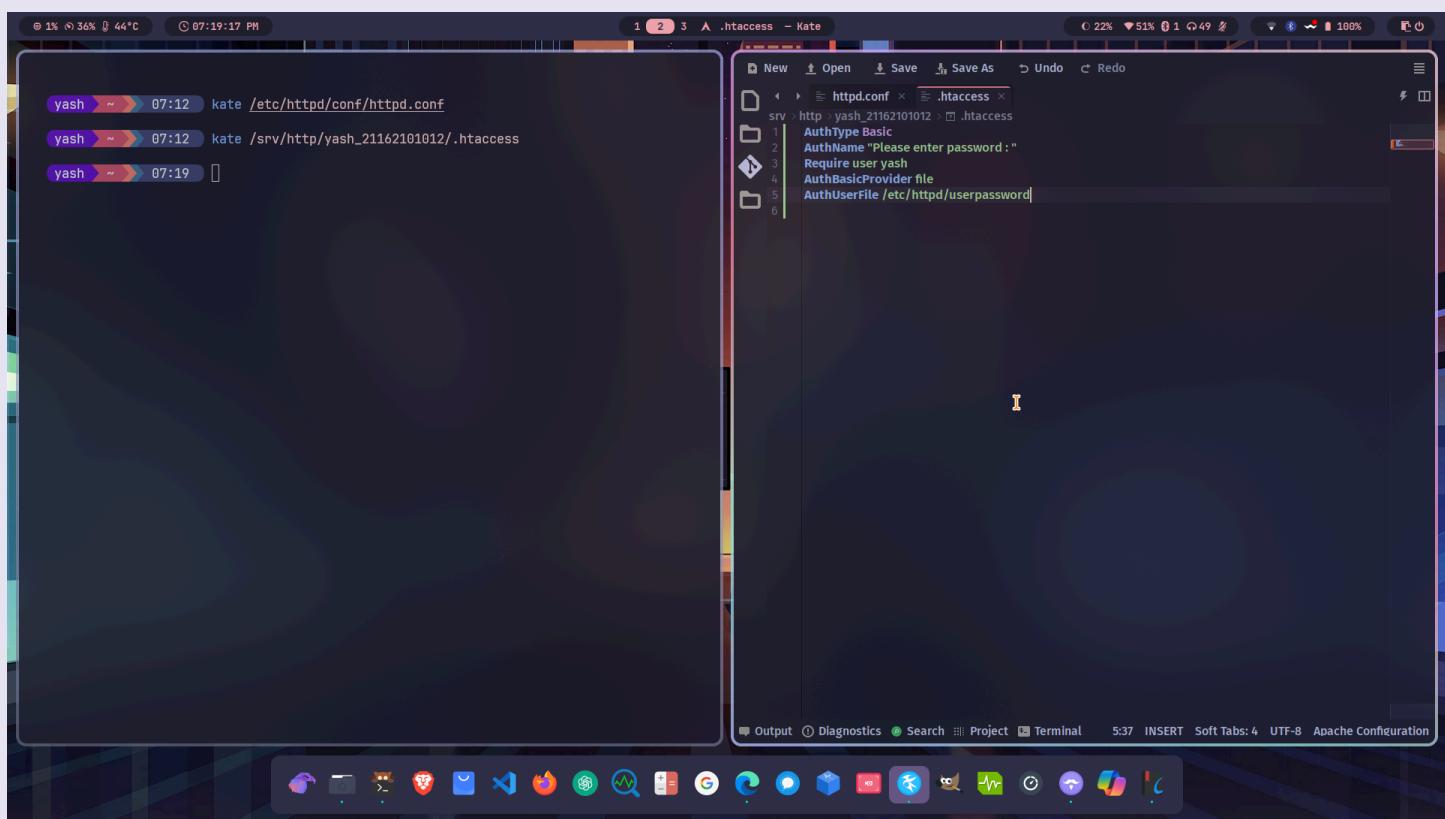
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- b. In the root directory of webpage, create a hidden .htaccess file with authentication text :

```
AuthType Basic
AuthName "Please enter password : "
Require user yash
AuthBasicProvider file
AuthUserFile /etc/httpd/userpassword
```



Command : **kate /srv/http/yash_21162101012/.htaccess**

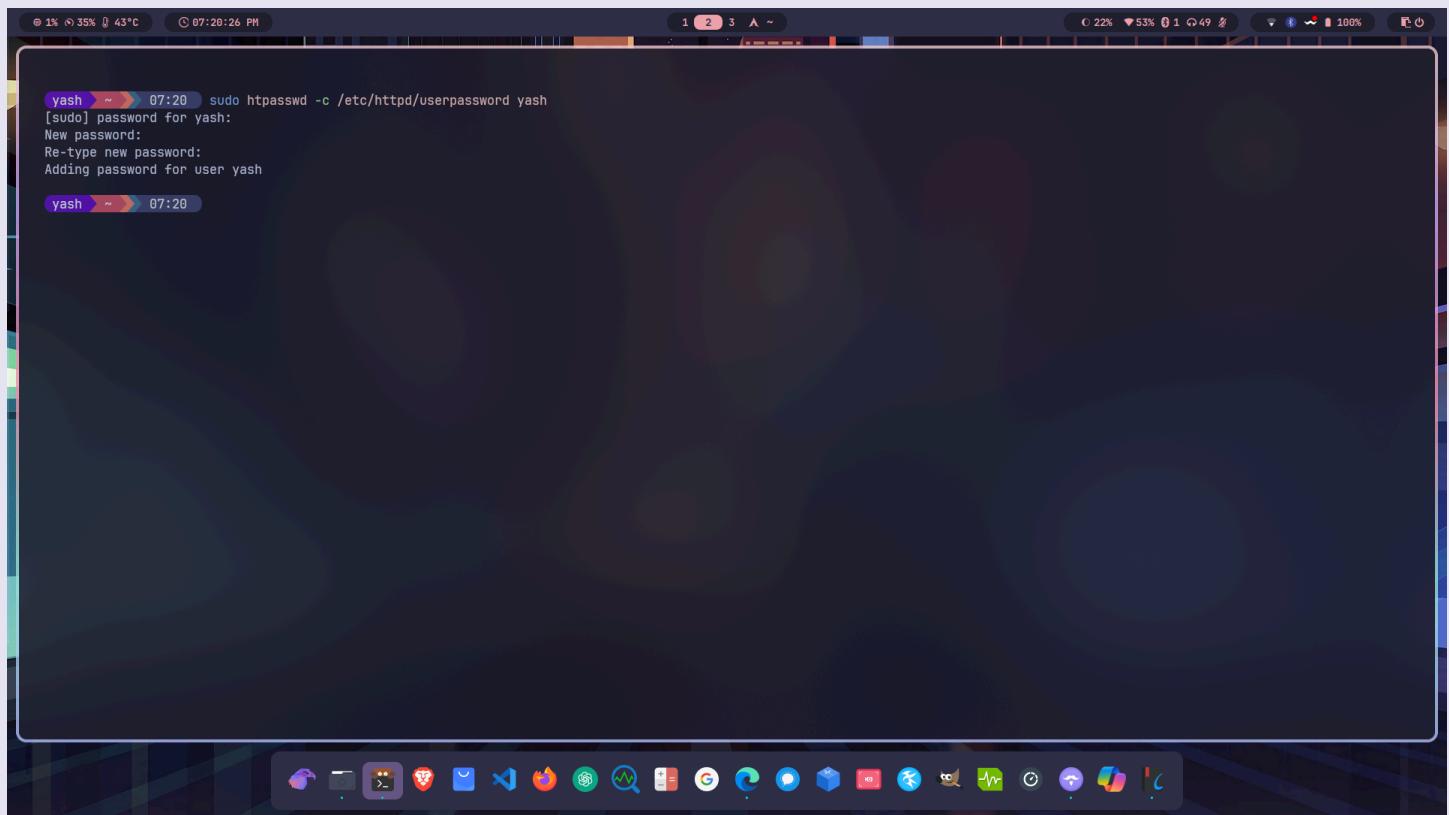
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c. Create user with password for apache server using htpasswd in a file.



A screenshot of a Linux desktop environment. A terminal window is open in the top-left corner, showing the command `sudo htpasswd -c /etc/httpd/userpassword yash` being run. The terminal shows the password entry process: [sudo] password for yash:, New password:, Re-type new password:, Adding password for user yash. The terminal window has a dark background and white text. The desktop interface includes a dock at the bottom with various application icons and a system tray at the top with battery, signal, and volume indicators.

Command : **sudo htpasswd -c /etc/httpd/userpassword yash**

Explanation : With root privileges, htpasswd creates (using option **-c** indicating to create a new file) user yash with specified password in the userpassword file specified.

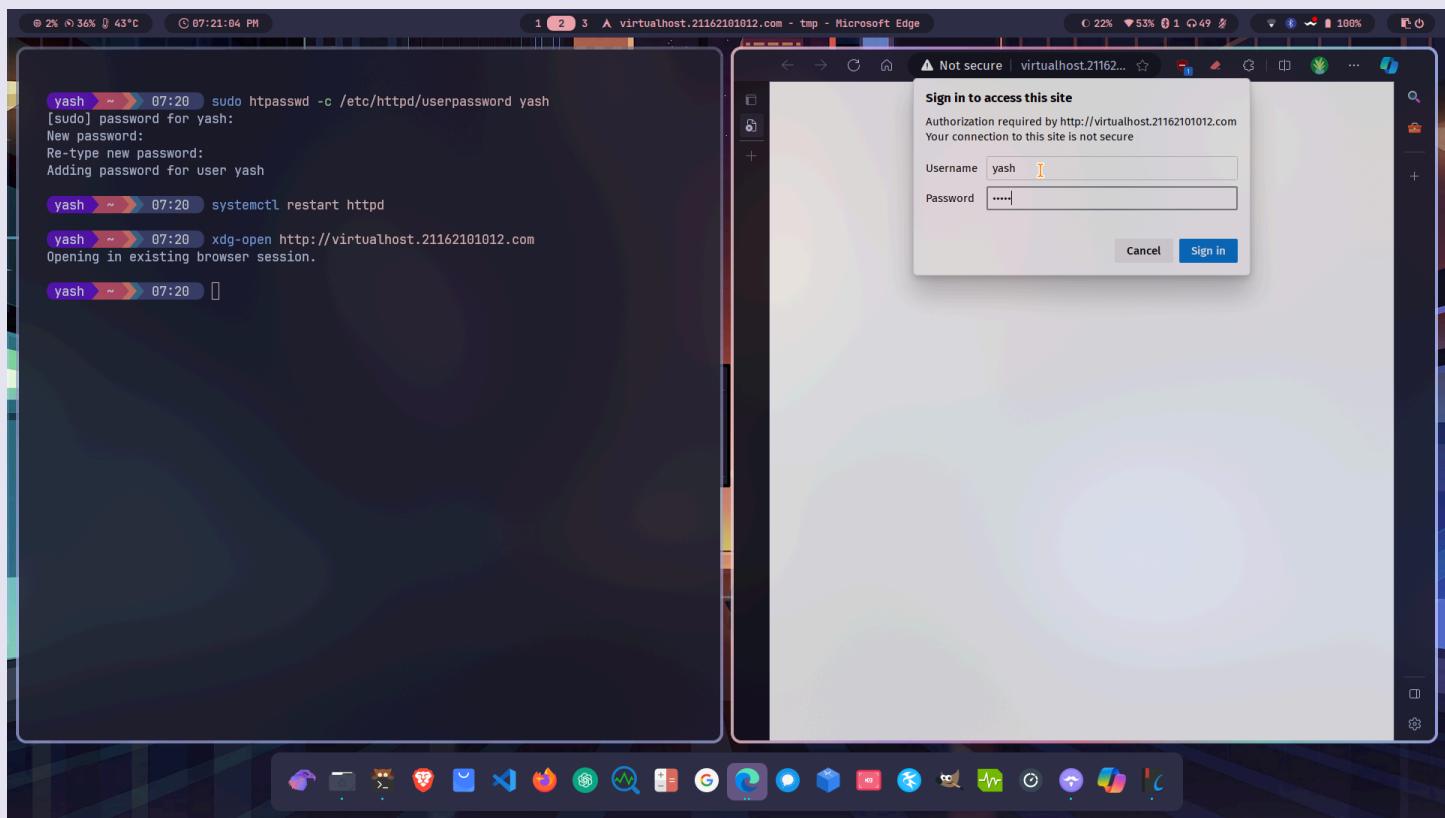
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- d. Restart the service and open the URL now, the browser will ask for authentication and check if it is successful.



Commands :

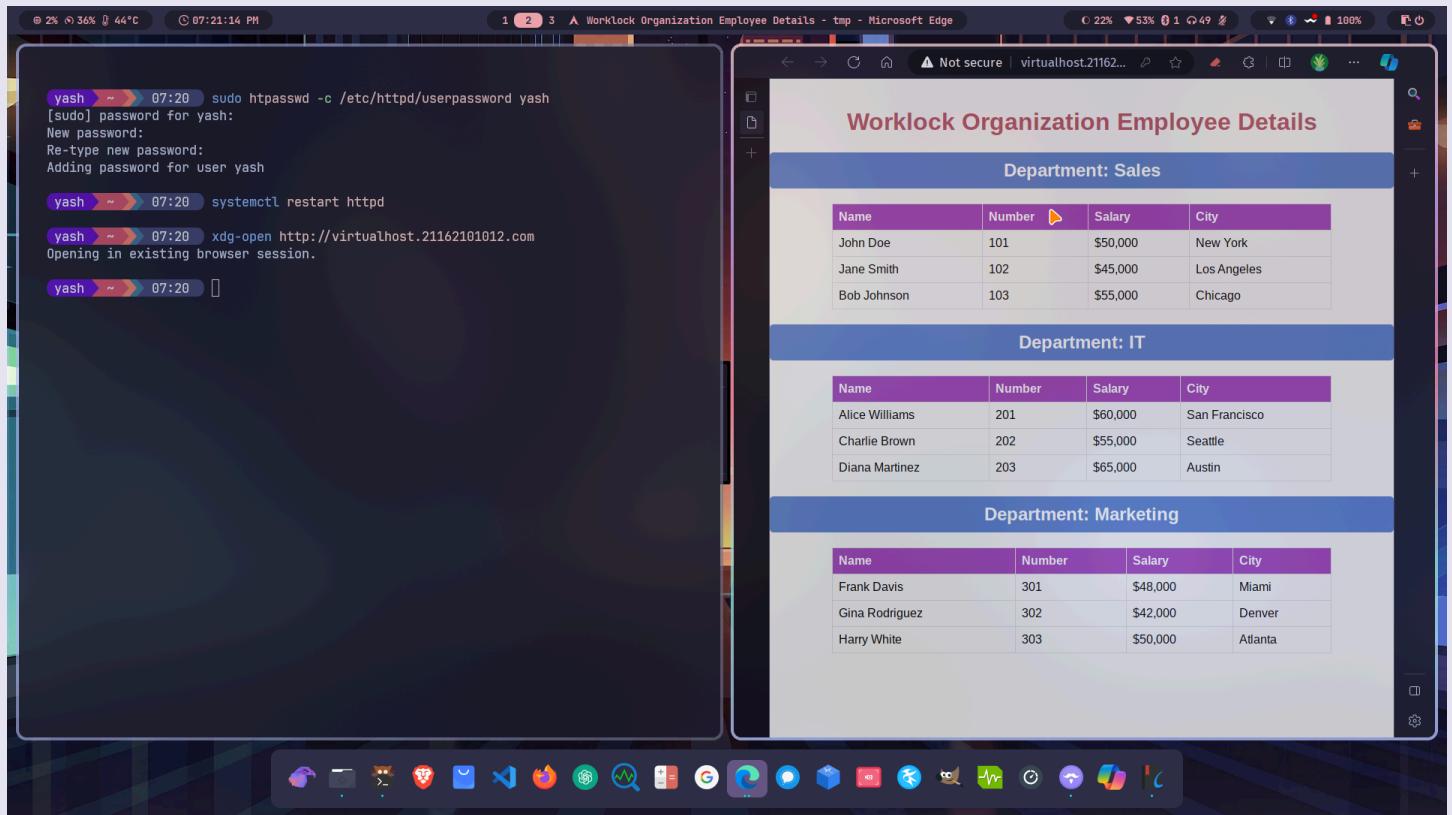
- **systemctl restart httpd**
- **xdg-open <http://virtualhost.21162101012.com>**

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2. Implement a website for `http://enrolmentnumber.yourname.com/group`.

Create a directory "groupauth" under the document root used for the website. The webpage should say "Welcome to the group and now you can access the site". The webpage must be configured for the group-based authentication and require users to login. Users "Jimmy" and "Emma" who belong to group operations should be able to access the share with password.

- Create the directories `groupauth/group` in apache root and create `index.html` file inside it.

The screenshot shows a Linux desktop environment with a terminal window and a Kate text editor window. The terminal window on the left displays the following commands:

```
yash ~ 07:24 sudo mkdir -p /srv/http/groupauth/group
yash ~ 07:24 kate /srv/http/groupauth/group/index.html
yash ~ 07:25
```

The Kate text editor window on the right shows the content of the `index.html` file:

```
<head>
<meta charset="UTF-8">
<meta name="viewport" content="width=device-width, initial-scale=1.0">
<title>Welcome to the Group</title>
<style>
body {
    font-family: Arial, sans-serif;
    text-align: center;
    background-color: #f8f8f8;
    margin: 0;
    padding: 0;
}
h1 {
    color: #dd7878;
    margin-top: 50px;
}
</style>
</head>
<body>
<div>
<h1>Welcome to the Group and now you can access the site</h1>
</div>
</body>
```

The status bar at the bottom of the Kate window shows:

Output Diagnostics Search Project Terminal 26:8 INSERT Soft Tabs: 4 UTF-8 HTML

Commands :

- `sudo mkdir -p /srv/http/groupauth/group`
- `kate /srv/http/groupauth/group/index.html`

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HTML Code :

```
<head>
    <meta charset="UTF-8">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <title>Welcome to the Group</title>
    <style>
        body {
            font-family: Arial, sans-serif;
            text-align: center;
            background-color: #f8f8f8;
            margin: 0;
            padding: 0;
        }

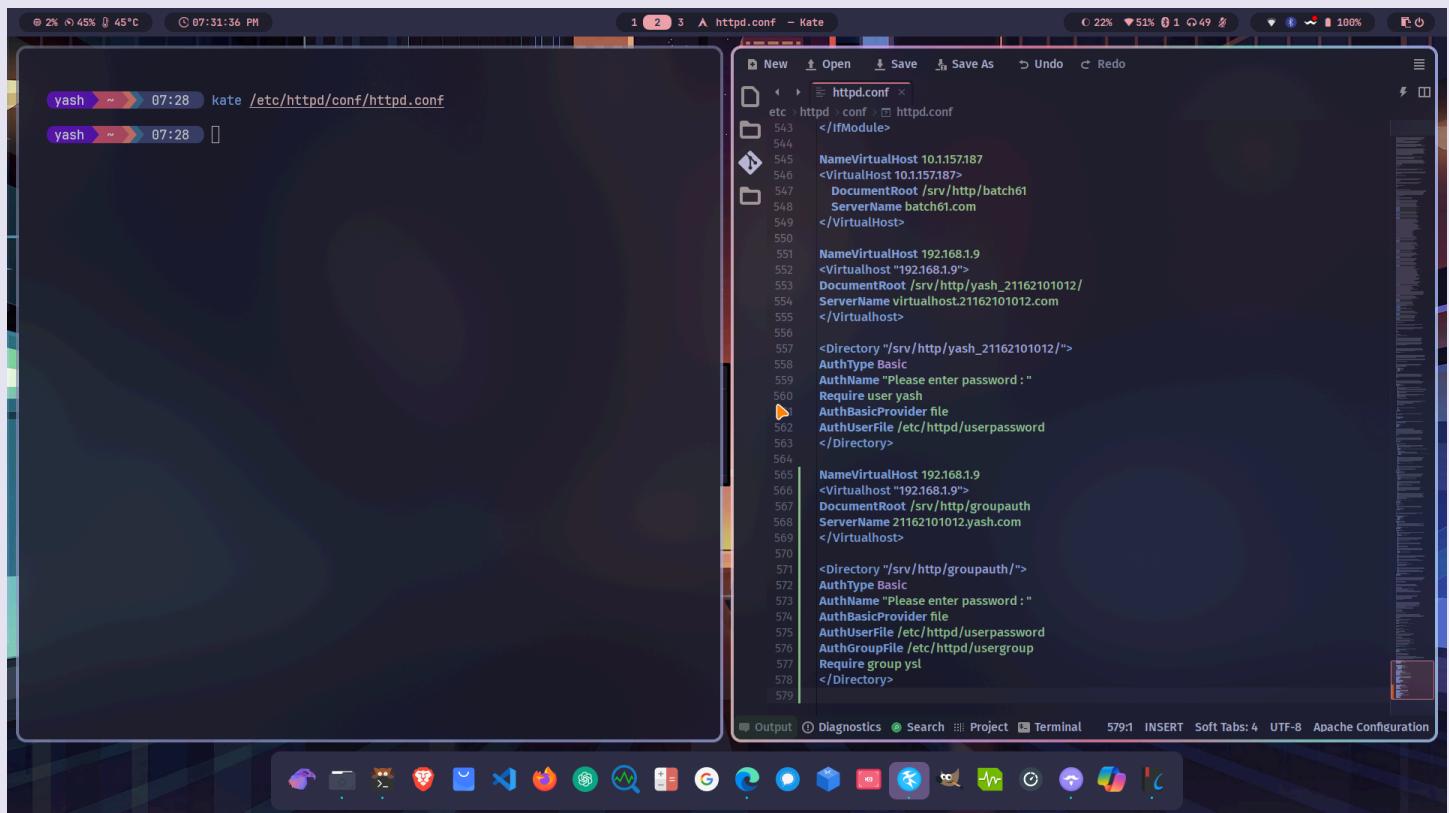
        h1 {
            color: #dd7878;
            margin-top: 50px;
        }
    </style>
</head>
<body>

<div>
    <h1>Welcome to the Group and now you can access the site</h1>
</div>

</body>
```

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b. Configure the httpd configuration file with the virtualhost and authentication.



```
1 2 3 A httpd.conf - Kate
yash ~ 07:28 kate /etc/httpd/conf/httpd.conf
yash ~ 07:28

httpd.conf
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550
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NameVirtualHost 10.1.157.187
<VirtualHost 10.1.157.187>
    DocumentRoot /srv/http/batch61
    ServerName batch61.com
</VirtualHost>

NameVirtualHost 192.168.1.9
<VirtualHost "192.168.1.9">
    DocumentRoot /srv/http/yash_21162101012/
    ServerName virtualhost.21162101012.com
</VirtualHost>

<Directory "/srv/http/yash_21162101012/">
    AuthType Basic
    AuthName "Please enter password :"
    Require user yash
    AuthBasicProvider file
    AuthUserFile /etc/httpd/userpassword
</Directory>

NameVirtualHost 192.168.1.9
<VirtualHost "192.168.1.9">
    DocumentRoot /srv/http/groupauth
    ServerName 21162101012.yash.com
</VirtualHost>

<Directory "/srv/http/groupauth/">
    AuthType Basic
    AuthName "Please enter password :"
    AuthBasicProvider file
    AuthUserFile /etc/httpd/userpassword
    AuthGroupFile /etc/httpd/usergroup
    Require group yst
</Directory>
```

Command : **kate /etc/httpd/conf/httpd.conf**

Text to copy :

```
NameVirtualHost 192.168.1.9
<Virtualhost "192.168.1.9">
DocumentRoot /srv/http/groupauth
ServerName 21162101012.yash.com
</Virtualhost>

<Directory "/srv/http/groupauth/">
AuthType Basic
AuthName "Please enter password : "
```

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```
AuthBasicProvider file
AuthUserFile /etc/httpd/userpassword
AuthGroupFile /etc/httpd/usergroup
Require group ysl
</Directory>
```

It specifies the virtualhost configuration for the webpage root directory and authentication details like user and group authentication via file.

c. Configure .htaccess inside the webpage root for authentication.

Text to copy :

```
AuthType Basic
AuthName "Please enter password : "
AuthBasicProvider file
AuthUserFile /etc/httpd/userpassword
AuthGroupFile /etc/httpd/usergroup
Require group ysl
```

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The screenshot shows a Linux desktop environment with a dark theme. At the top, there is a system tray with icons for battery (2%), signal strength (45%), temperature (44°C), and time (07:32:22 PM). Below the tray is a terminal window showing command-line history:

```
yash ~ 07:28 kate /etc/httpd/conf/httpd.conf
yash ~ 07:28 kate /srv/http/groupauth/.htaccess
yash ~ 07:32
```

To the right of the terminal is a Kate text editor window titled ".htaccess - Kate". The file contains the following Apache configuration code:

```
AuthType Basic
AuthName "Please enter password :"
AuthBasicProvider file
AuthUserFile /etc/httpd/userpassword
AuthGroupFile /etc/httpd/usergroup
Require group ysl
```

The Kate interface includes a toolbar with various icons, a status bar at the bottom with tabs like Output, Diagnostics, Search, Project, Terminal, and file statistics, and a docked application bar at the bottom.

Command : **kate /srv/http/groupauth/.htaccess**

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d. Now, allow the IP and the servername via adding the entry in /etc/hosts.

The screenshot shows a Linux desktop environment with a dark theme. In the top-left corner, there is a terminal window with a purple header bar. The terminal shows the user's session:

```
yash ~ 07:28 kate /etc/httpd/conf/httpd.conf
yash ~ 07:28 kate /srv/http/groupauth/.htaccess
yash ~ 07:32 kate /etc/hosts
yash ~ 07:32
```

In the top-right corner, there is a Kate text editor window. The title bar says "hosts - Kate". The file menu includes "New", "Open", "Save", "Save As", "Undo", and "Redo". The sidebar shows the file structure under "/etc": "hosts", "Standard host addresses", and ".htaccess". The main text area contains the following content:

```
# Standard host addresses
127.0.0.1 localhost
::1 localhost ip6-localhost ip6-loopback
ff02::1 ip6-allnodes
ff02::2 ip6-allrouters
# This host address
127.0.1.1 haribol64
10.1.157.187 batch61.com
192.168.1.9 virtualhost.21162101012.com
192.168.1.9 21162101012.yash.com
```

At the bottom of the screen, there is a dock with various application icons. The status bar at the bottom right shows "13:33 INSERT Soft Tabs: 4 UTF-8 Normal".

Command : **kate /etc/hosts**

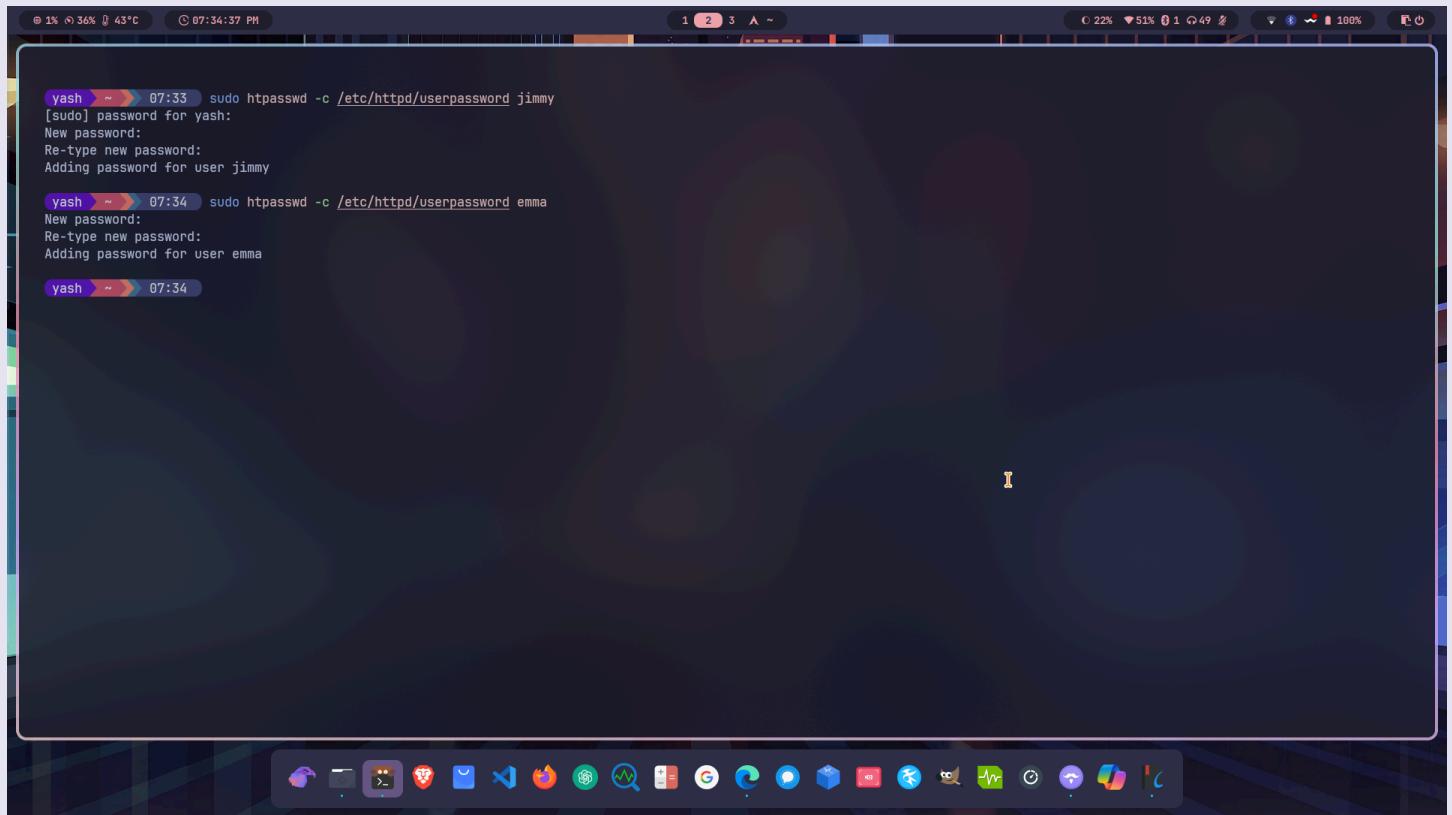
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e. Add users jimmy and emma and configure their password for apache server.



The screenshot shows a Linux desktop environment with a terminal window open. The terminal window has a dark background and light-colored text. It displays two commands being run:

```
yash ~ > 07:33 sudo htpasswd -c /etc/httpd/userpassword jimmy  
[sudo] password for yash:  
New password:  
Re-type new password:  
Adding password for user jimmy  
  
yash ~ > 07:34 sudo htpasswd -c /etc/httpd/userpassword emma  
New password:  
Re-type new password:  
Adding password for user emma  
  
yash ~ > 07:34
```

Below the terminal window, a dock bar contains various application icons, including a browser, file manager, terminal, and system tools. The desktop background is a dark, abstract design.

Commands :

- **sudo htpasswd -c /etc/httpd/userpassword jimmy**
- **sudo htpasswd -c /etc/httpd/userpassword emma**

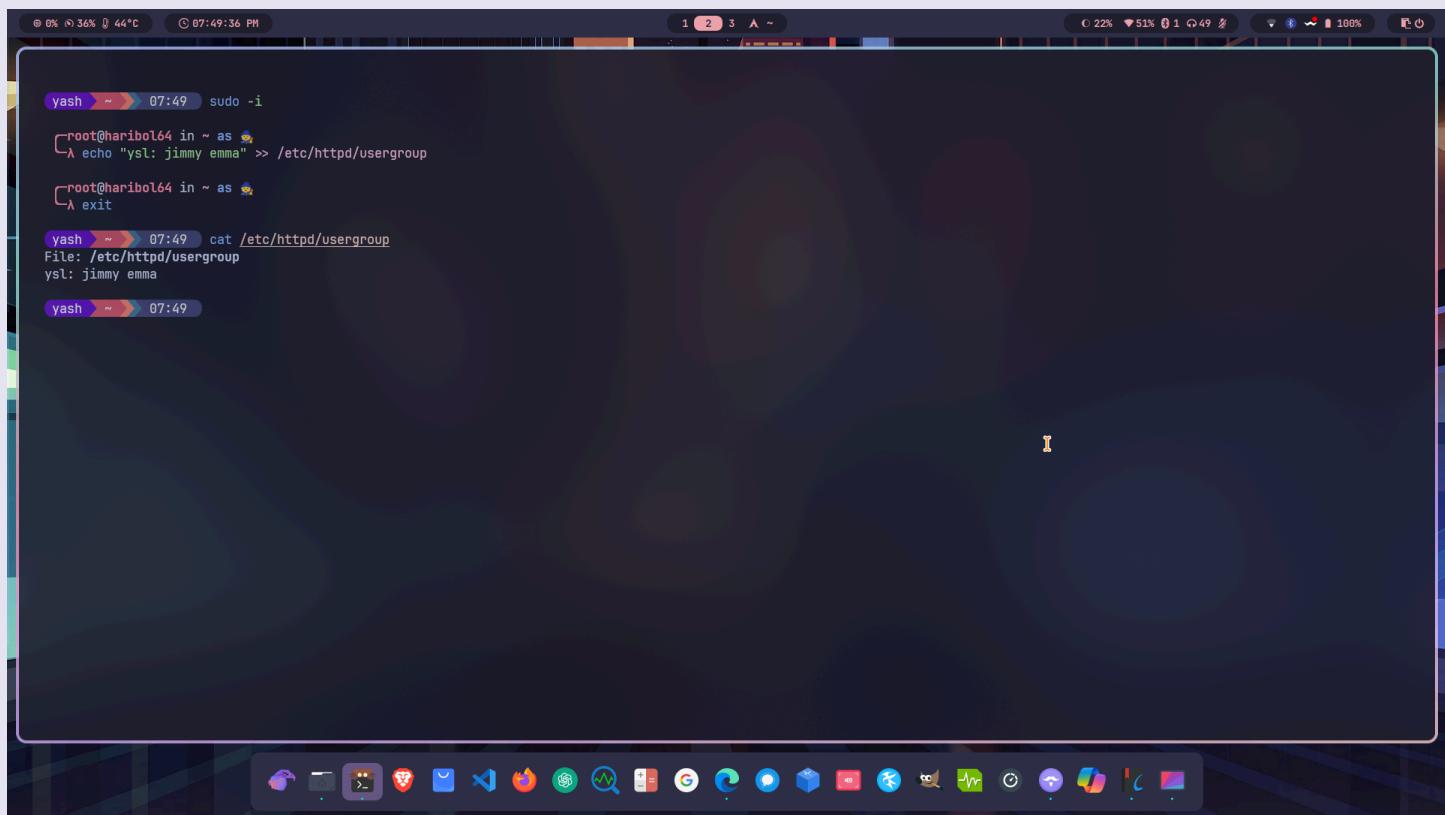
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- f. Now, add the group containing these new users jimmy and emma in the usergroup file.



```
yash ~ 07:49 sudo -i
[✓] root@haribol64 in ~ as 🌐
└ λ echo "ysl: jimmy emma" >> /etc/httpd/usergroup
└ λ exit
yash ~ 07:49 cat /etc/httpd/usergroup
File: /etc/httpd/usergroup
ysl: jimmy emma
yash ~ 07:49
```

Command : **echo "ysl: jimmy emma" >> /etc/httpd/usergroup**

Explanation : echo gives stdout text specified (ysl group here containing jimmy and emma as users) and appends the text to usergroup file

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g. Restart the httpd service to ensure changes.

```
yash ~ 07:49 sudo -i
[root@haribol64 ~]# echo "ysl: jimmy emma" >> /etc/httpd/usergroup
[root@haribol64 ~]# exit
yash ~ 07:49 cat /etc/httpd/usergroup
File: /etc/httpd/usergroup
ysl: jimmy emma
yash ~ 07:49 systemctl restart httpd
yash ~ 07:49 |
```

Command : **systemctl restart httpd**

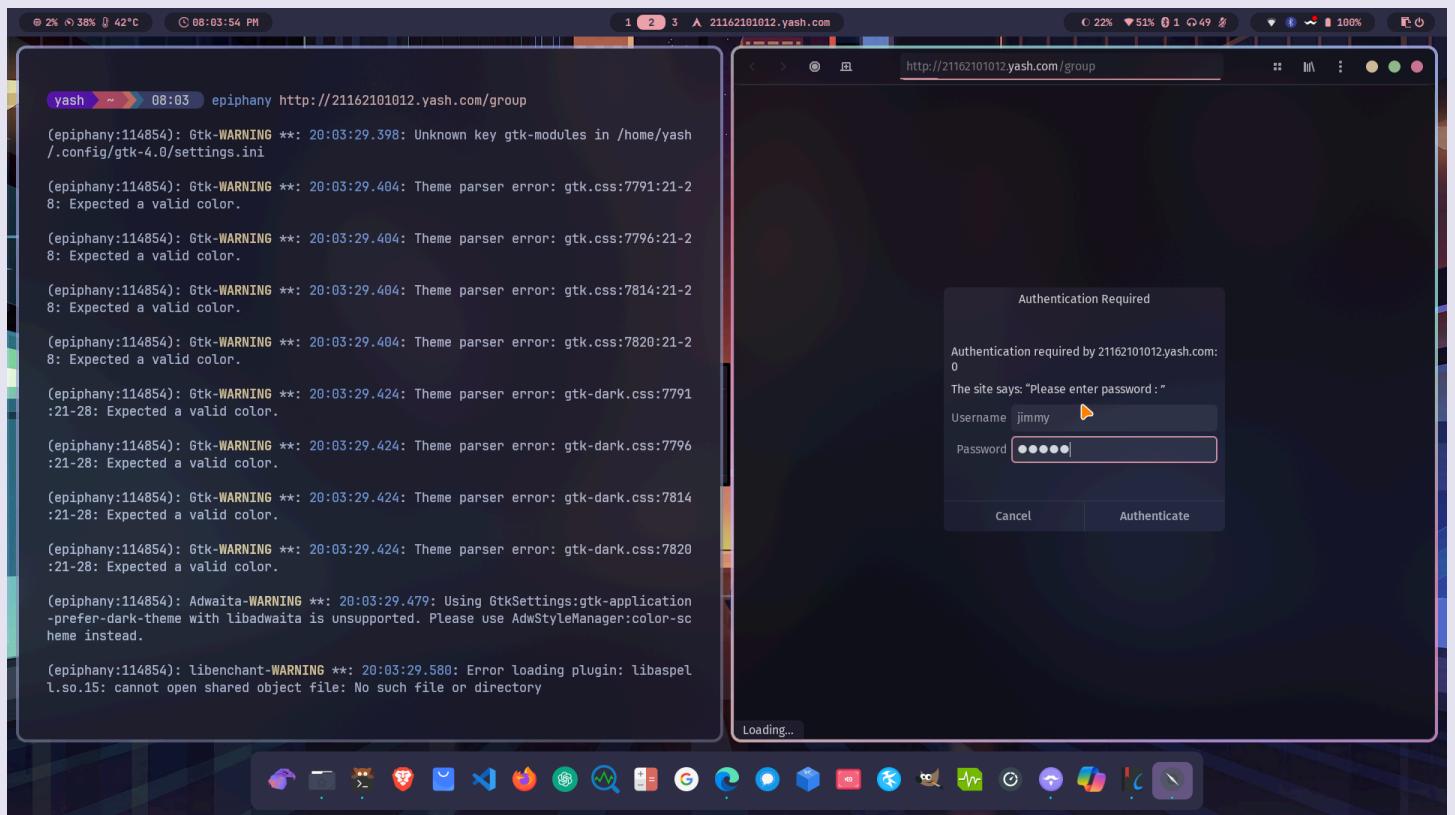
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h. Open the URL in the browser and check if authentication is successful.



Command : [epiphany http://21162101012.yash.com](http://21162101012.yash.com)

Explanation : epiphany, known popularly as GNOME Web is the GTK Webkit based browser, URL specified here is opened with the browser.

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