



**Ganpat
University**

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-----PRACTICAL 07-----

AIM : For this practical, you will add a physical volume, volume group, logical volume, and an XFS file system. You will persistently mount the logical volume file system.

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")

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

» Login as root user and install httpd service:

```

[student@workstation:~/student]$ su root
[student@workstation ~]$ su root
[student@workstation ~]$ (process:2660): dconf-WARNING **: 00:16:04.397: failed to commit changes to dconf: The connection is closed
[student@workstation ~]$ yum install httpd
Red Hat Enterprise Linux 8.2 BaseOS (dvd)        60 kB/s | 2.8 kB    00:00
Red Hat Enterprise Linux 8.2 AppStream (dvd)     585 kB/s | 3.2 kB    00:00
Dependencies resolved.
=====
Package           Arch      Version                               Repository                               Size
=====
Installing:
httpd              x86_64    2.4.37-21.module+el8.2.0+5008+cca404a3  rhel-8.2-for-x86_64-appstream-rpms     1.4 M
Installing dependencies:
apr                x86_64    1.6.3-9.el8                           rhel-8.2-for-x86_64-appstream-rpms     125 k
apr-util           x86_64    1.6.1-6.el8                           rhel-8.2-for-x86_64-appstream-rpms     105 k
httpdfilesystem    noarch    2.4.37-21.module+el8.2.0+5008+cca404a3  rhel-8.2-for-x86_64-appstream-rpms      36 k
httpd-tools        x86_64    2.4.37-21.module+el8.2.0+5008+cca404a3  rhel-8.2-for-x86_64-appstream-rpms     103 k
mod_http2          x86_64    1.11.3-3.module+el8.2.0+4377+dc421495   rhel-8.2-for-x86_64-appstream-rpms      25 k
redhat-logos-httpd noarch    81.1-1.el8                             rhel-8.2-for-x86_64-baseos-rpms         26 k
Installing weak dependencies:
apr-util-bdb       x86_64    1.6.1-6.el8                           rhel-8.2-for-x86_64-appstream-rpms      25 k
apr-util-openssl   x86_64    1.6.1-6.el8                           rhel-8.2-for-x86_64-appstream-rpms      27 k
Enabling module streams:
httpd               2.4

```

commands :

su root

yum install httpd

» To start the httpd service use following command :

service httpd start

```

[root@workstation student]$ service httpd start
Redirecting to /bin/systemctl start httpd.service
[root@workstation student]$

```

» By running these commands, you'll navigate to the home directory for the Apache web server (**httpd**) and see the files and directories within that location :

cd var/www/html

```

[root@workstation student]$ cd /var/www/html
[root@workstation html]$ ls
[root@workstation html]$

```

Then restart the service and check status of httpd service :

service httpd restart

service httpd status

```

Red Hat
Activities Terminal Feb 10 01:44
student@workstation:/var/www/html

[root@workstation html]# service httpd restart
Redirecting to /bin/systemctl restart httpd.service
[root@workstation html]# service httpd status
Redirecting to /bin/systemctl status httpd.service
● httpd.service - The Apache HTTP Server
   Loaded: loaded (/usr/lib/systemd/system/httpd.service; disabled; vendor preset: disabled)
   Active: active (running) since Sat 2024-02-10 01:43:52 EST; 12s ago
     Docs: man:httpd.service(8)
  Main PID: 31330 (httpd)
    Status: "Running, listening on: port 80"
    Tasks: 213 (Limit: 36446)
   Memory: 38.9M
    CGroup: /system.slice/httpd.service
            └─31330 /usr/sbin/httpd -DFOREGROUND
              └─31338 /usr/sbin/httpd -DFOREGROUND
                └─31339 /usr/sbin/httpd -DFOREGROUND
                  └─31340 /usr/sbin/httpd -DFOREGROUND
                    └─31341 /usr/sbin/httpd -DFOREGROUND

Feb 10 01:43:52 workstation.lab.example.com systemd[1]: Stopped The Apache HTTP Server.
Feb 10 01:43:52 workstation.lab.example.com systemd[1]: Starting The Apache HTTP Server...
Feb 10 01:43:52 workstation.lab.example.com systemd[1]: Started The Apache HTTP Server.
Feb 10 01:43:52 workstation.lab.example.com httpd[31330]: Server configured, listening on:
lines 1-19/19 (END)

```

» **Make a directory and another directory inside according to the url for eg. we need virtualhost.21162101014.com/tushar than tushar will be the name of the directory we make inside tushar_21162101014 :**

```

[root@workstation html]# mkdir tushar_21162101014
[root@workstation html]# cd tushar_21162101014
[root@workstation tushar_21162101014]#

```

commands :

mkdir tushar_21162101014

cd tushar_21162101014

» **Adding a index.html using touch index.html inside tushar and code a html page which will be shown on browser :**

```

[root@workstation tushar_21162101014]# mkdir tushar
[root@workstation tushar_21162101014]# cd tushar/
[root@workstation tushar]# touch index.html
[root@workstation tushar]# vim index.html

```

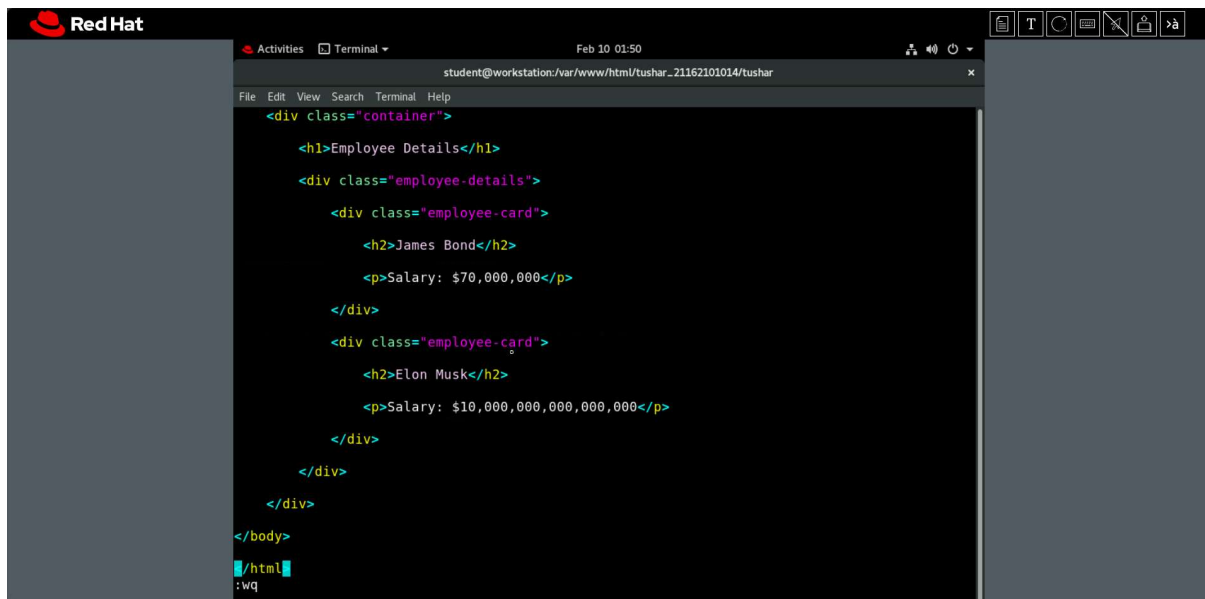
commands :

mkdir tushar

cd tushar

touch index.html

vim index.html



```

Red Hat
Activities Terminal Feb 10 01:50
student@workstation:/var/www/html/tushar_21162101014/tushar
File Edit View Search Terminal Help
<div class="container">
  <h1>Employee Details</h1>
  <div class="employee-details">
    <div class="employee-card">
      <h2>James Bond</h2>
      <p>Salary: $70,000,000</p>
    </div>
    <div class="employee-card">
      <h2>Elon Musk</h2>
      <p>Salary: $10,000,000,000,000,000</p>
    </div>
  </div>
</div>
</body>
/html
:wq

```

» **Now we to make our directory available on the virtual host and provide authentication open /etc/httpd/conf/httpd.conf file and enter the following details :**

command: **vim /etc/httpd/conf/httpd.conf**

to open and edit config file

```
[root@workstation ~]# vim /etc/httpd/conf/httpd.conf
```

Add this in httpd.conf file as shown below :

```

NameVirtualHost 172.25.250.9
<VirtualHost 172.25.250.9>
  DocumentRoot /var/www/html/tushar_21162101014
  ServerName virtualhost.21162101014.com
</VirtualHost>
<Directory '/var/www/html/tushar_21162101014'>
  AuthType Basic
  AuthName "Please Enter Your Password"
  AuthBasicProvider file
  AuthUserFile /etc/httpd/userpassword
  Require user tushar
</Directory>

```

Let's break down the configuration:

1. **NameVirtualHost 172.25.250.9:**

- This line is used to specify the IP address (**172.25.250.9**) for which name-based virtual hosts are defined. This directive is used in older versions of Apache. In Apache 2.4 and later, this directive is not required.

2. **<VirtualHost 172.25.250.9>:**

- This block defines the configuration for a specific virtual host with the IP address **172.25.250.9**.
- **DocumentRoot /var/www/html/tushar_21162101014:** Sets the document root for the virtual host. It specifies the directory where the web server will look for files to serve for this virtual host.
- **ServerName virtualhost.21162101014.com:** Sets the server name for the virtual host. It specifies the domain name associated with this virtual host.
- **</VirtualHost>:** Closes the configuration block for the virtual host.

3. **<Directory '/var/www/html/tushar_21162101014'>:**

- This block specifies the configuration directives that apply to the specified directory (**/var/www/html/tushar_21162101014**).
- **AuthType Basic:** Specifies that basic authentication will be used.
- **AuthName "Please Enter Your Password":** Sets the message that will be displayed to users when they try

to access the resource, prompting them to enter a password.

- **AuthBasicProvider file:** Specifies that user and password information will be checked through a file.
- **AuthUserFile /etc/httpd/userpassword:** Specifies the location of the file that contains user details (username and encrypted password).
- **Require user tushar:** Specifies that only the user "tushar" is allowed to access the resource. Other users will be denied access.

```

# EnableMMAP and EnableSendfile: On systems that support it,
# memory-mapping or the sendfile syscall may be used to deliver
# files. This usually improves server performance, but must
# be turned off when serving from networked-mounted
# filesystems or if support for these functions is otherwise
# broken on your system.
# Defaults if commented: EnableMMAP On, EnableSendfile Off
#
#EnableMMAP off
EnableSendfile on

# Supplemental configuration
#
# Load config files in the "/etc/httpd/conf.d" directory, if any.
IncludeOptional conf.d/*.conf
NameVirtualHost 172.25.250.9
<VirtualHost 172.25.250.9>
    DocumentRoot /var/www/html/tushar_21162101014
    ServerName virtualhost.21162101014.com
</VirtualHost>
<Directory '/var/www/html/tushar_21162101014'>
    AuthType Basic
    AuthName "Please Enter Your Password"
    AuthBasicProvider file
    AuthUserFile /etc/httpd/userpassword
    Require user tushar
</Directory>

```

» Add the hosts in /etc/hosts file :

command: `vim /etc/httpd/hosts`

add this line :

172.25.250.9 virtualhost.21162101014.com

```

Red Hat
Activities Terminal Feb 10 01:12 student@workstation:~
File Edit View Search Terminal Help
127.0.0.1 localhost localhost.localdomain localhost4 localhost4.localdomain4
::1 localhost localhost.localdomain localhost6 localhost6.localdomain6
172.25.254.254 classroom.example.com classroom
172.25.254.254 content.example.com content
172.25.254.254 materials.example.com materials
### rht-vm-hosts file listing the entries to be appended to /etc/hosts
127.25.250.9 virtualhost.21162101014.com
172.25.250.9 workstation.lab.example.com workstation
172.25.250.10 servera.lab.example.com servera
172.25.250.11 serverb.lab.example.com serverb
172.25.250.254 bastion.lab.example.com bastion
172.25.250.220 utility.lab.example.com utility
172.25.250.220 registry.lab.example.com registry
:~$

```

» Let's make an user first :

command: `htpasswd -c /etc/httpd/userpassword tushar`

Let's break down the commands we've executed :

The **htpasswd** command is used to create and update files used to store usernames and password for basic authentication in Apache HTTP Server.

- **-c option:** This option is used to create a new password file or update an existing one. If the file specified by the path (**/etc/httpd/userpassword** in this case) does not exist, it will be created.
- **/etc/httpd/userpassword:** This is the path to the password file that will store the usernames and encrypted passwords. It's important to secure this file, and it should be placed in a location that is not accessible to unauthorized users.
- **tushar:** This is the username for which you want to create or update the password. The **htpasswd** command will prompt you to enter a password for the specified user. Once entered, it will store the encrypted password in the password file.

After running this command, you'll be prompted to enter and confirm the password for the user "tushar." The encrypted password will then be added to the **/etc/httpd/userpassword** file. This file is referenced in the Apache

configuration (**AuthUserFile**) to perform user authentication when accessing protected resources.

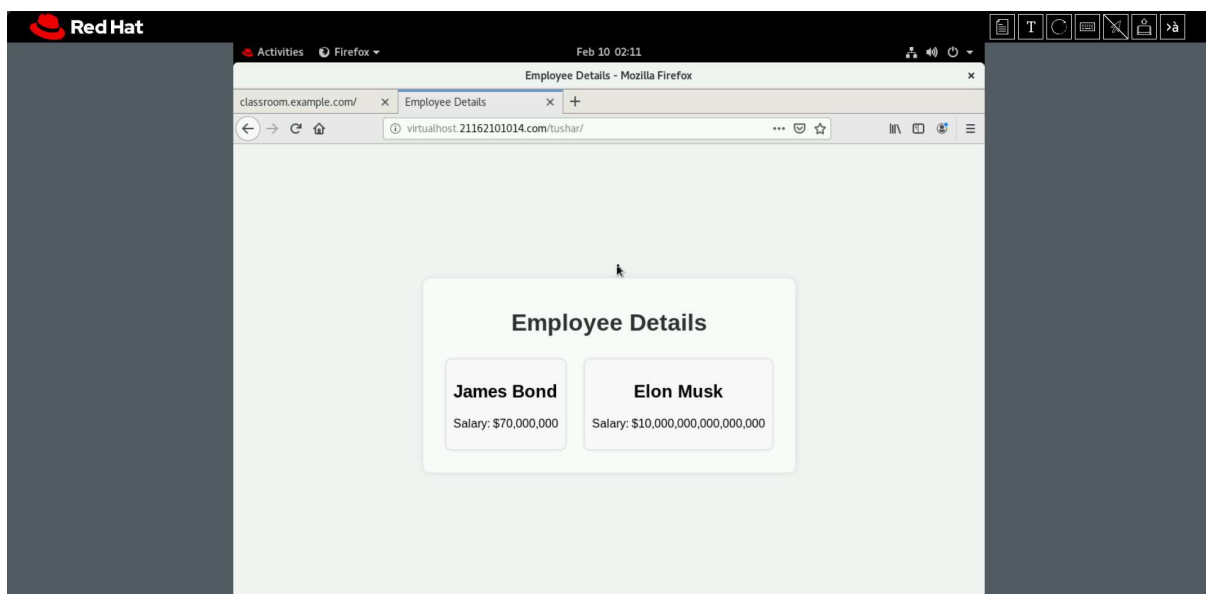
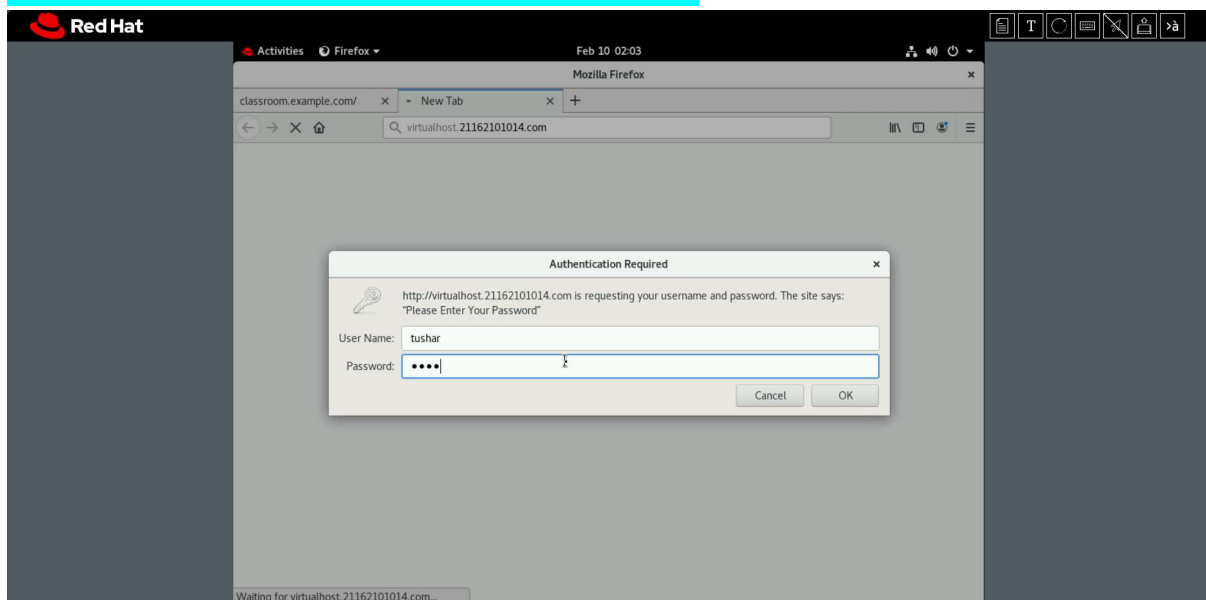
```
[root@workstation ~]# htpasswd -c /etc/httpd/userpassword tushar
New password:
Re-type new password:
Adding password for user tushar
[root@workstation ~]#
```

» **Then restart the service and check status of httpd service :**

command: `service httpd restart`

Then try to access our server that we created :

virtualhost.21162101014.com/tushar/



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.

» Make directory groupauth and index.html inside the html folder :

```
[root@workstation student]# mkdir /var/www/html/groupauth
[root@workstation student]# mkdir /var/www/html/groupauth/group
[root@workstation student]# touch /var/www/html/groupauth/group/index.html
[root@workstation student]# vim /var/www/html/groupauth/group/index.html
```

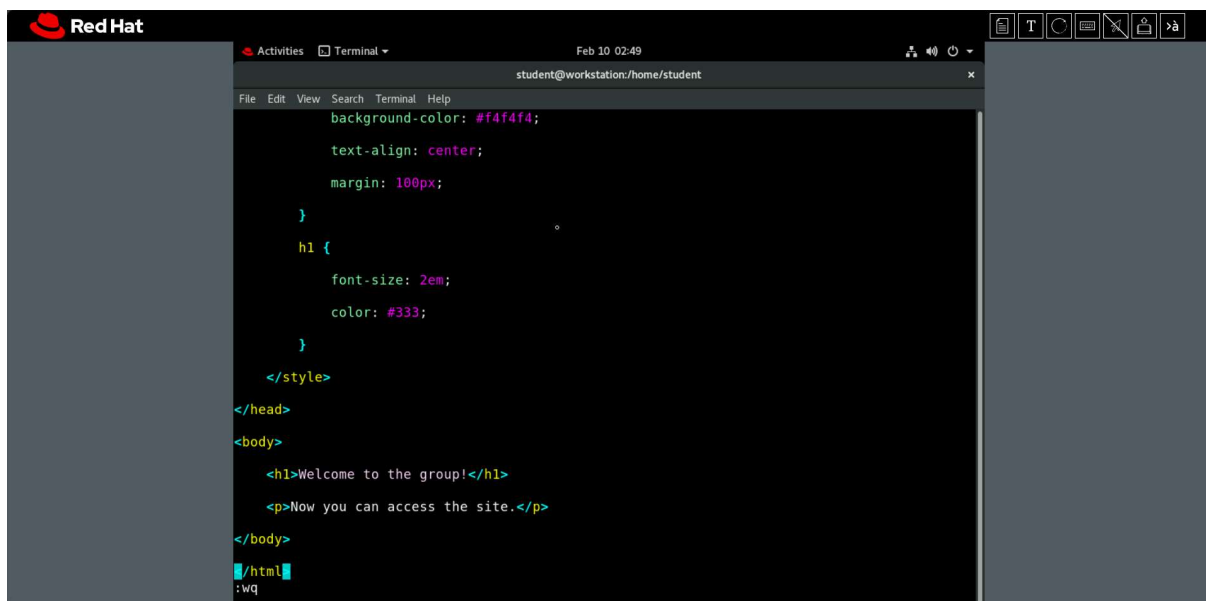
commands :

```
mkdir /var/www/html/groupauth
```

```
mkdir /var/www/html/groupauth/group
```

```
touch /var/www/html/groupauth/group/index.html
```

```
vim /var/www/html/groupauth/group/index.html
```



```
Red Hat
Activities Terminal Feb 10 02:49
student@workstation/home/student
File Edit View Search Terminal Help
background-color: #f4f4f4;
text-align: center;
margin: 100px;
}
h1 {
font-size: 2em;
color: #333;
}
</style>
</head>
<body>
<h1>Welcome to the group!</h1>
<p>Now you can access the site.</p>
</body>
</html>
:wq
```

» Open /etc/httpd/conf/httpd.conf file and write the following configuration:

command: `vim /etc/httpd/conf/httpd.conf`

to open and edit config file

→Add this in httpd.conf file as shown below :

```
NameVirtualHost 172.25.250.9
<VirtualHost 172.25.250.9>
    DocumentRoot /var/www/html/groupauth
    ServerName 21162101024.tushar.com
    <Directory '/var/www/html/groupauth'>
        AuthType Basic
        AuthName "Please Enter your password"
        AuthBasicProvider file
        AuthGroupFile /etc/httpd/usergroup
        Require group cba14
    </Directory>
</VirtualHost>
```

Let's break down the configuration :

1. NameVirtualHost 172.25.250.9:

- This line specifies that virtual hosts are configured to use the IP address 172.25.250.9. In older versions of Apache, this directive was used to specify the IP address to be used for name-based virtual hosting. In modern versions, this is often not needed.

2. <VirtualHost 172.25.250.9>:

- This block defines the configuration for a virtual host that will respond to requests on IP address 172.25.250.9.

3. DocumentRoot /var/www/html/groupauth:

- This line sets the document root for the virtual host. It specifies the directory on the server where the files for this virtual host are located. In this case, it's set to **/var/www/html/groupauth**.

4. ServerName 21162101024.tushar.com:

- This line sets the server name for the virtual host. It specifies the domain name associated with this virtual host. In this case, it's set to **21162101024.tushar.com**.

5. <Directory '/var/www/html/groupauth'>:

- This block specifies configuration directives that apply to the specified directory (**/var/www/html/groupauth** in this case).

6. **AuthType Basic:**

- This line specifies the type of authentication to be used. In this case, it's Basic authentication, which prompts users for a username and password.

7. **AuthName "Please Enter your password":**

- This line sets the authentication realm or name. It's the message that will be displayed to users when they are prompted for a password.

8. **AuthBasicProvider file:**

- This line specifies that authentication information will be stored in a flat-file.

9. **AuthGroupFile /etc/httpd/usergroup:**

- This line specifies the path to the file containing group information for authentication. The file specified here (**/etc/httpd/usergroup**) likely contains group information used in the **Require** directive.

10. **Require group cba14:**

- This line specifies that access is restricted to users who are part of the group named **cba14**. Users need to authenticate, and their group membership is checked against the specified group.

```
[root@workstation ~]# vim /etc/httpd/conf/httpd.conf
```

```

# EnableMMAP and EnableSendfile: On systems that support it,
# memory-mapping or the sendfile syscall may be used to deliver
# files. This usually improves server performance, but must
# be turned off when serving from networked-mounted
# filesystems or if support for these functions is otherwise
# broken on your system.
# Defaults if commented: EnableMMAP On, EnableSendfile Off
#
#EnableMMAP off
EnableSendfile on

# Supplemental configuration
#
# Load config files in the "/etc/httpd/conf.d" directory, if any.
IncludeOptional conf.d/*.conf
NameVirtualHost 172.25.250.9
<VirtualHost 172.25.250.9>
    DocumentRoot /var/www/html/groupauth
    ServerName 21162101024.tushar.com
    <Directory '/var/www/html/groupauth'>
        AuthType Basic
        AuthName "Please Enter your password"
        AuthBasicProvider file
        AuthGroupFile /etc/httpd/usergroup
        Require group cba14
    </Directory>
</VirtualHost>
:wq

```

» **Add authentication configuration written in httpd.conf file to /rootdir-path/.htaccess :**

```

[root@workstation student]# vim /var/www/html/groupauth/.htaccess
[root@workstation student]#

```

```

AuthType Basic
AuthName "Please Enter your password"
AuthBasicProvider file
AuthGroupFile /etc/httpd/usergroup
Require group cba14

```

command: vim /var/www/html/groupauth/.htaccess

» Add the ip, domain in in /etc/hosts file :

command: `vim /etc/hosts`

add this line :

172.25.250.9 21162101014.tushar.com

```
[root@workstation student]# vim /etc/hosts
```

```

Red Hat
Activities Terminal Feb 10 03:12
student@workstation/home/student
File Edit View Search Terminal Help
127.0.0.1 localhost localhost.localdomain localhost4 localhost4.localdomain4
::1 localhost localhost.localdomain localhost6 localhost6.localdomain6

172.25.254.254 classroom.example.com classroom
172.25.254.254 content.example.com content
172.25.254.254 materials.example.com materials
### rht-vm-hosts file listing the entries to be appended to /etc/hosts
172.25.250.9 21162101014.tushar.com
172.25.250.9 workstation.lab.example.com workstation
172.25.250.10 servera.lab.example.com servera
172.25.250.11 serverb.lab.example.com serverb
172.25.250.254 bastion.lab.example.com bastion
172.25.250.220 utility.lab.example.com utility
172.25.250.220 registry.lab.example.com registry

:wq

```

» Making 2 users name Jimmy & Emma and adding them to usergroup file at /etc/httpd/usergroup with the groupname:

cbal4 Jimmy Emma

command: `htpasswd -c /etc/httpd/userpassword Jimmy`

command: `htpasswd -c /etc/httpd/userpassword Emma`

Let's break down the commands we've executed :

1. `htpasswd -c /etc/httpd/userpassword Jimmy`

- **htpasswd:** This is the command itself.
- **-c:** This option is used to create a new password file. If the file already exists, using this option will overwrite it.

- **/etc/httpd/userpassword**: This is the path to the password file. In this case, it's specified as **/etc/httpd/userpassword**.
- **Jimmy**: This is the username for which you are creating or updating the password.

This command is creating a new password file (**/etc/httpd/userpassword**) if it doesn't exist, and adding or updating the password entry for the user "Jimmy."

2. **htpasswd -c /etc/httpd/userpassword Emma**

- **htpasswd**: The command itself.
- **-c**: Again, this option is used to create a new password file. If the file already exists, using this option will overwrite it.
- **/etc/httpd/userpassword**: This is the path to the password file.
- **Emma**: This is the username for which you are creating or updating the password.

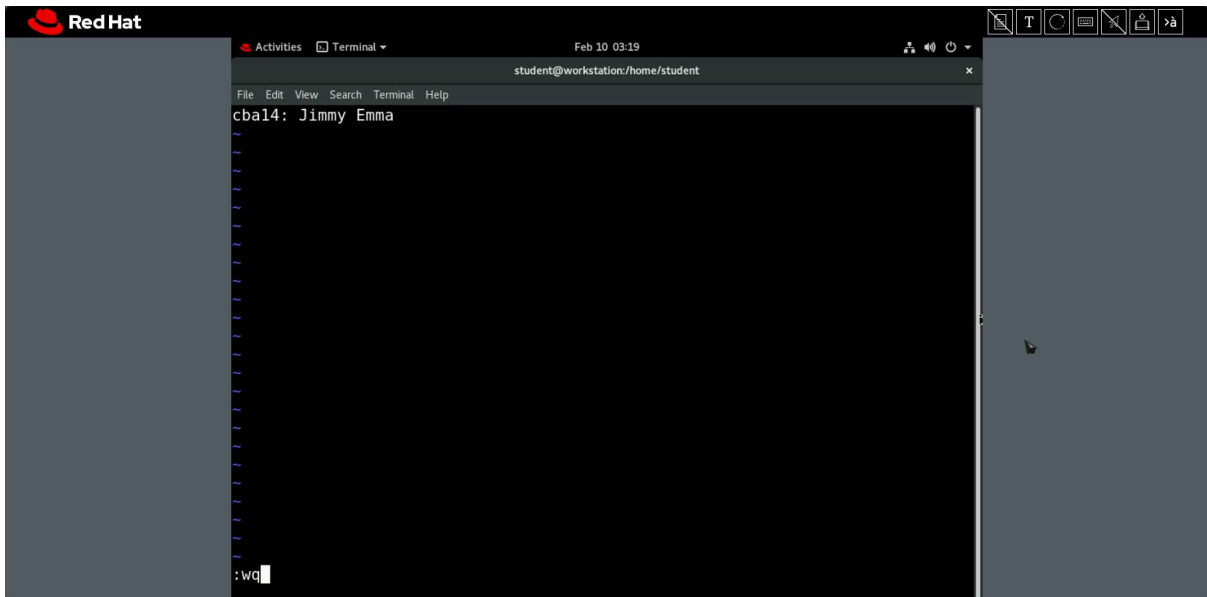
Similarly to the first command, this command is creating a new password file (**/etc/httpd/userpassword**) if it doesn't exist, and adding or updating the password entry for the user "Emma."

```
[root@workstation student]# htpasswd -c /etc/httpd/userpassword Jimmy
New password:
Re-type new password:
Adding password for user Jimmy
[root@workstation student]# htpasswd -c /etc/httpd/userpassword Emma
New password:
Re-type new password:
Adding password for user Emma
[root@workstation student]#
```

→ Now add users to usergroup directory :

command: `vim /etc/httpd/usergroup`

```
[root@workstation student]# vim /etc/httpd/usergroup
[root@workstation student]#
```



» Then restart the service and check status of httpd service :

Command : `service httpd restart`

```
[root@workstation student]# service httpd restart
Redirecting to /bin/systemctl restart httpd.service
[root@workstation student]#
```

Now try to access our directory is accessible through virtual host:

21162101014.tushar.com/group/

