



Apache Project Part-II

420-635-AB-Network Installation and Administration I

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Objective:

- ✓ *Configure a Virtual Host Server.*
- ✓ *Create websites identified by a combination of the following: **IP address, domain name and port number.***

TASK 1 – PREPARATION

- The root directory for this project must be `"/var/www/html_project2"`.

```
[root@server18 ~]# mkdir /var/www/html_project2
[root@server18 ~]# cd /var/www/html_project2
```

- A web page named **master_project2.html** should be placed in this directory and configured as the default page for the root.

```
[root@server18 html_project2]# touch master_project2.html
```

```
[root@server18 conf]# vim httpd.conf
```

```
ServerRoot "/etc/httpd/"
Listen 192.168.50.10:80
Listen 10.35.16.1:80
Listen 10.35.16.1:8000

Include conf.modules.d/*.conf
User apache
Group apache
ServerAdmin root@localhost
ServerName server18.local.itmt.ca:80
<Directory />
    AllowOverride none
    Require all denied
</Directory>
DocumentRoot "/var/www/html_project2"
```

```
<IfModule dir_module>
    DirectoryIndex master_project2.html
</IfModule>
```

- The **master_project2.html** page must include hyperlinks allowing users to test each question and every scenario related to each question in this lab. See the example provided on the last page of this document.

```
[root@server18 html_project2]# vim master_project2.html
```

```

<!doctype html>
<html>
  <head>
    <title> Project part 2 - Homepage</title>
  </head>
  <body>
    <h2 class="title">Welcome to Project 2</h2>
    <hr>
    <h3 class="subtitle"><u><b>Task 2</b></u></h3>
    <ul>
      <p><b><u><a href=http://virtual1.aucegep.com>http://virtual1.aucegep.com/</a></u></b></p>
      <p><b><u><a href=http://virtual1.aucegep.com:8000>http://virtual1.aucegep.com:8000/</a></u></b></p>
      <p><b><u><a href=http://virtual2.aucegep.com>http://virtual2.aucegep.com/</a></u></b></p>
      <p><b><u><a href=http://virtual2.aucegep.com:8000>http://virtual2.aucegep.com:8000/</a></u></b></p>
    </ul>
    <hr>
    <h3 class="subtitle"><u><b>Task 3</b></u></h3>
    <ul>
      <p><b><u><a href=http://www.ici.com>http://www.ici.com/</a></u></b></p>
      <p><b><u><a href=http://intranet.ici.com>http://intranet.ici.com/</a></u></b></p>
      <p><b><u><a href=http://intranet.ici.com:8000>http://intranet.ici.com:8000/</a></u></b></p>
      <p><b><u><a href=http://development.ici.com>http://development.ici.com/</a></u></b></p>
    </ul>
    <hr>
    <h3 class="subtitle"><u><b>Task 4</b></u></h3>
    <ul>
      <p><b><u><a href=http://10.35.16.1:8080>http://10.35.16.1:8080/</a></u></b></p>
      <p><b><u><a href=http://10.35.16.1:8081>http://10.35.16.1:8081/</a></u></b></p>
      <p><b><u><a href=http://10.35.16.1:8082>http://10.35.16.1:8082/</a></u></b></p>
      <p><b><u><a href=http://10.35.16.1:8083>http://10.35.16.1:8083/</a></u></b></p>
    </ul>
    <hr>
    <h3 class="subtitle"><u><b>Task 5</b></u></h3>
    <ul>
      <p><b><u><a href=http://www.itmt.com>http://www.itmt.com/</a></u></b></p>
      <p><b><u><a href=http://www.itmt.ca>http://www.itmt.ca/</a></u></b></p>
      <p><b><u><a href=http://www2.itmt.com>http://www2.itmt.com/</a></u></b></p>
      <p><b><u><a href=http://www.montmo.com>http://www.montmo.com/</a></u></b></p>
      <p><b><u><a href=http://www.montmo.ca>http://www.montmo.ca/</a></u></b></p>
    </ul>
    <hr>
  </body>
</html>

```

Project Part 2

Task 2

<http://virtual1.aucegep.com/>

<http://virtual1.aucegep.com:8000/>

<http://virtual2.aucegep.com/>

<http://virtual2.aucegep.com:8000/>

Task 3

<http://www.ici.com/>

<http://intranet.ici.com/>

<http://intranet.ici.com:8000/>

<http://development.ici.com/>

Task 4

<http://10.35.16.1:8080>

<http://10.35.16.1:8081>

<http://10.35.16.1:8082>

<http://10.35.16.1:8083>

Task 5

<http://www.itmt.com>

<http://www.itmt.ca>

<http://www2.itmt.com>

<http://www.montmo.com>

<http://www.montmo.ca>

TASK 2 – NAME-BASED AND PORT-BASED VIRTUAL HOSTS

- Create **virtual hosts** identified by both **hostname** and **port**, using the names provided below.
- All servers in this exercise will use the same IP address: **10.35.16.1**.
 - However, this address must be different from the main non-virtual website.

```
ServerRoot "/etc/httpd/"
Listen 192.168.50.10:80
```

- You will need to edit the **/etc/hosts** file accordingly to resolve the hostnames.

```
[root@server18 ~]# vim /etc/hosts
192.168.50.10 server18.local.itmt.qc.ca
10.35.16.1      www.virtual1.aucegep.com virtual1.aucegep.com *.virtual1.aucegep.com
www.virtual2.aucegep.com virtual2.aucegep.com *.virtual2.aucegep.com
```

- Since these are virtual hosts, the basic Apache configuration will be similar for all of them:
 - Each server will have its **own directory** to store web pages.

```
[root@server18 www]# mkdir -p virtuals/virtual1_80
[root@server18 www]# mkdir -p virtuals/virtual1_8000
[root@server18 www]# mkdir -p virtuals/virtual2_80
[root@server18 www]# mkdir -p virtuals/virtual2_8000
```

- Each server must also use its **own log files**.

```
[root@server18 www]# mkdir virtuals/virtual1_80/logs
[root@server18 www]# mkdir virtuals/virtual1_8000/logs
[root@server18 www]# mkdir virtuals/virtual2_80/logs
[root@server18 www]# mkdir virtuals/virtual2_8000/logs
```

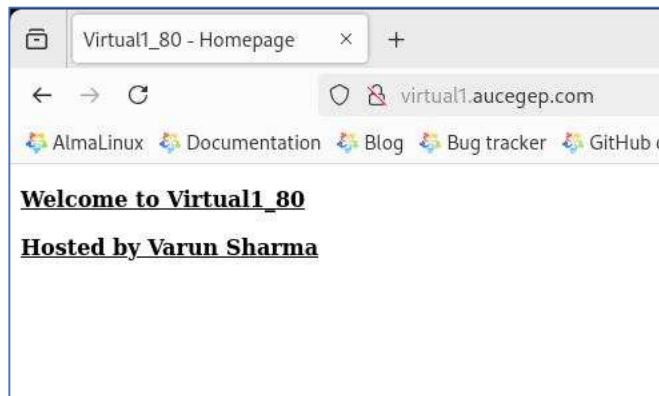
- Virtual Hosts configuration details:
 - Hostname: **virtual1.aucegep.com**
 - Port: 80
 - Document Root: **/var/www/ virtuals/virtual1_80**


```
<!doctype html>
<html>
  <head>
    <title> Virtual1_80 - Homepage </title>
  </head>
  <body>
    <p><u><b>Welcome to Virtual1_80</b></u></p>
    <p><u><b>Hosted by Varun Sharma</b></u></p>
  </body>
</html>
```

Index file:

```
<VirtualHost 10.35.16.1:80>
  DocumentRoot /var/www/virtuals/virtual1_80
  ServerName www.virtual1.aucegep.com
  ServerAlias virtual1.aucegep.com
  ErrorLog /var/www/virtuals/virtual1_80/logs/error_log
  TransferLog /var/www/virtuals/virtual1_80/logs/access_log
</VirtualHost>
```

Conf file:



Website:

➤ Hostname: **virtual2.aucegep.com**

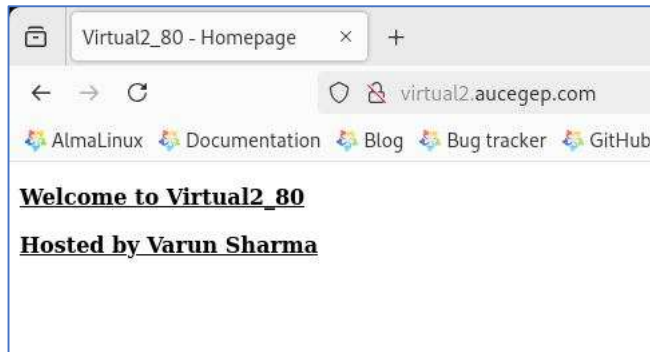
- Port: 80
- Document Root: **/var/www/virtuals/virtual2_80**

```
<!doctype html>
<html>
  <head>
    <title> Virtual2_80 - Homepage </title>
  </head>
  <body>
    <p><u><b>Welcome to Virtual2_80</b></u></p>
    <p><u><b>Hosted by Varun Sharma</b></u></p>
  </body>
</html>
```

Index file :


```
<VirtualHost 10.35.16.1:80>
  DocumentRoot /var/www/virtual2/virtual2_80
  ServerName www.virtual2.aucegep.com
  ServerAlias virtual2.aucegep.com
  ErrorLog /var/www/virtuals/virtual2_80/logs/error_log
  TransferLog /var/www/virtuals/virtual2_80/logs/access_log
</VirtualHost>
```

Conf file :



Website :

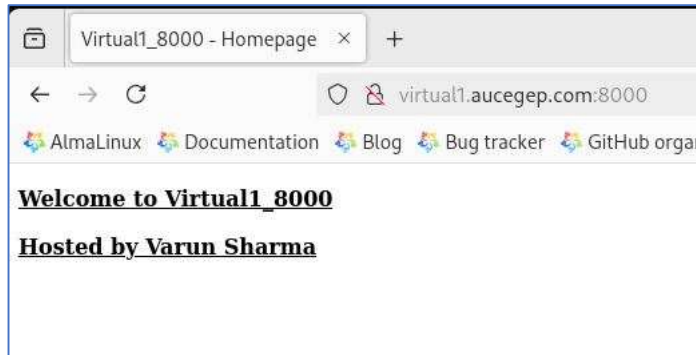
- Hostname: **virtual1.aucegep.com**
 - Port: 8000
 - Document Root: **/var/www/virtuals/virtual1_8000**

```
<!doctype html>
<html>
  <head>
    <title> Virtual1_8000 - Homepage </title>
  </head>
  <body>
    <p><u><b>Welcome to Virtual1_8000</b></u></p>
    <p><u><b>Hosted by Varun Sharma</b></u></p>
  </body>
</html>
```

Index file :

```
<VirtualHost 10.35.16.1:8000>
  DocumentRoot /var/www/virtuals/virtual1_8000
  ServerName www.virtual1.aucegep.com
  ServerAlias virtual1.aucegep.com
  ErrorLog /var/www/virtuals/virtual1_8000/logs/error_log
  TransferLog /var/www/virtuals/virtual1_8000/logs/access_log
</VirtualHost>
```

Conf file :



Website :

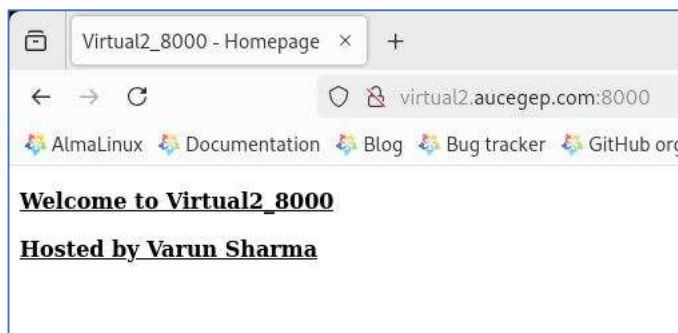
- Hostname: **virtual2.aucegep.com**
 - Port: 8000
 - Document Root: **/var/www/virtuals/virtual2_8000**

```
<!doctype html>
<html>
  <head>
    <title> Virtual2_8000 - Homepage </title>
  </head>
  <body>
    <p><u><b>Welcome to Virtual2_8000</b></u></p>
    <p><u><b>Hosted by Varun Sharma</b></u></p>
  </body>
</html>
```

Index file :

```
<VirtualHost 10.35.16.1:8000>
  DocumentRoot /var/www/virtuals/virtual2_8000
  ServerName www.virtual2.aucegep.com
  ServerAlias virtual2.aucegep.com
  ErrorLog /var/www/virtuals/virtual2_8000/logs/error_log
  TransferLog /var/www/virtuals/virtual2_8000/logs/access_log
</VirtualHost>
```

Conf file :



Website :

TASK 3 – NAME-BASED VIRTUAL HOSTS WITH ACCESS CONTROL

- Server IP addresses: 10.35.17.1

```
Listen 10.35.17.1:80
Listen 10.35.17.1:8000
```

- You are required to create virtual servers using **name-based hosting**, with **access permissions** and **document roots** as described below:

- Hostname: **www.ici.com**
 - Port: 80
 - Document Root: **/var/www/virtuals/ici**
 - Accessible to everyone (no restrictions).

```
<!doctype html>
<html>
  <head>
    <title> www.ici.com - Homepage </title>
  </head>
  <body>
    <p><u><b>Welcome to www.ici.com</b></u></p>
    <p><u><b>Hosted by Varun Sharma</b></u></p>
  </body>
</html>
```

Index File:

```
<VirtualHost 10.35.17.1:80>
  DocumentRoot /var/www/virtuals/ici
  ServerName www.ici.com
  ServerAlias ici.com
  ErrorLog /var/www/virtuals/ici/logs/error_log
  TransferLog /var/www/virtuals/ici/logs/access_log
</VirtualHost>
```

Conf File:



Website:

- Hostname: **intranet.ici.com** Port: 80
 - Document Root: **/var/www/virtuals/intranet**
 - Accessible to everyone (no restrictions).

```
<!doctype html>
<html>
  <head>
    <title> intranet.ici.com - Homepage </title>
  </head>
  <body>
    <p><u><b>Welcome to intranet.ici.com</b></u></p>
    <p><u><b>Hosted by Varun Sharma</b></u></p>
  </body>
</html>
```

Index File:

```
<VirtualHost 10.35.17.1:80>
  DocumentRoot /var/www/virtuals/intranet
  ServerName intranet.ici.com
  ServerAlias www.intranet.ici.com
  ErrorLog /var/www/virtuals/intranet/logs/error_log
  TransferLog /var/www/virtuals/intranet/logs/access_log
</VirtualHost>
```

Conf File:



Website:

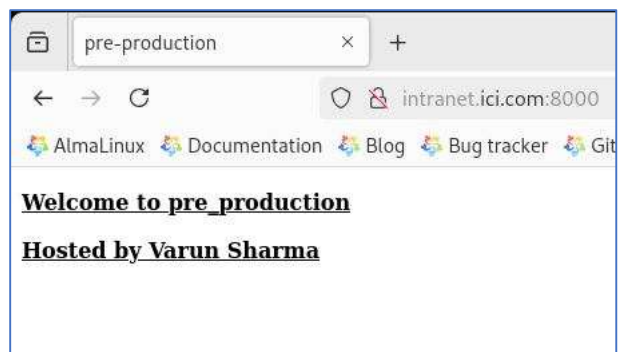
- Hostname: **intranet.ici.com**
 - Port 8000
 - Document Root: **/var/www/virtuals/pre_production**
 - Accessible only from the **10.35.17.0/24** subnet.

```
<!doctype html>
<html>
  <head>
    <title> pre-production </title>
  </head>
  <body>
    <p><u><b>Welcome to pre_production</b></u></p>
    <p><u><b>Hosted by Varun Sharma</b></u></p>
  </body>
</html>
```

Index File:

```
<VirtualHost 10.35.17.1:8000>
  DocumentRoot /var/www/virtuals/pre_production
  ServerName intranet.ici.com
  ServerAlias www.intranet.ici.com
  ErrorLog /var/www/virtuals/pre_production/logs/error_log
  TransferLog /var/www/virtuals/pre_production/logs/access_log
  <Directory "/var/www/virtuals/pre_production">
    <RequireAll>
      Require ip 10.35.17
    </RequireAll>
  </Directory>
</VirtualHost>
```

Conf File:



Website:

- Hostname: **development.ici.com**
 - Port 80
 - Document Root: **/var/www/virtuals/development**
 - Accessible only from the **10.35.17.0/24** subnet.

```
<!doctype html>
<html>
  <head>
    <title> development.ici.com - Homepage </title>
  </head>
  <body>
    <p><u><b>Welcome to development</b></u></p>
    <p><u><b>Hosted by Varun Sharma</b></u></p>
  </body>
</html>
```

Index File:


```
<VirtualHost 10.35.17.1:80>
  DocumentRoot /var/www/virtuals/development
  ServerName development.ici.com
  ServerAlias www.development.ici.com
  ErrorLog /var/www/virtuals/development/logs/error_log
  TransferLog /var/www/virtuals/development/logs/access_log
  <Directory "/var/www/virtuals/development">
    <RequireAll>
      Require ip 10.35.17
    </RequireAll>
  </Directory>
</VirtualHost>
```

Conf File:



Website:

TASK 4 – VIRTUAL WEB SERVERS BY IP AND PORT

- Create and configure **four virtual web servers** as described below.
- Use a separate directory for each server under:
/var/www/virtuals/q4/<server_name>
- For example, the **sales** web server will use:
/var/www/virtuals/q4/sales

```
[root@server18 www]# mkdir -p virtuals/q4/sales
[root@server18 www]# mkdir -p virtuals/q4/admin
[root@server18 www]# mkdir -p virtuals/q4/thing
[root@server18 www]# mkdir -p virtuals/q4/other
[root@server18 www]# mkdir -p virtuals/q4/other/logs
[root@server18 www]# mkdir -p virtuals/q4/thing/logs
[root@server18 www]# mkdir -p virtuals/q4/admin/logs
[root@server18 www]# mkdir -p virtuals/q4/sales/logs
```

- To access each server, use the IP address **10.35.16.1** followed by the corresponding port number. For example:
http://10.35.16.1:8080 should display the **sales** web server homepage.


```
Listen 10.35.16.1:8080
Listen 10.35.16.1:8081
Listen 10.35.16.1:8082
Listen 10.35.16.1:8083
```

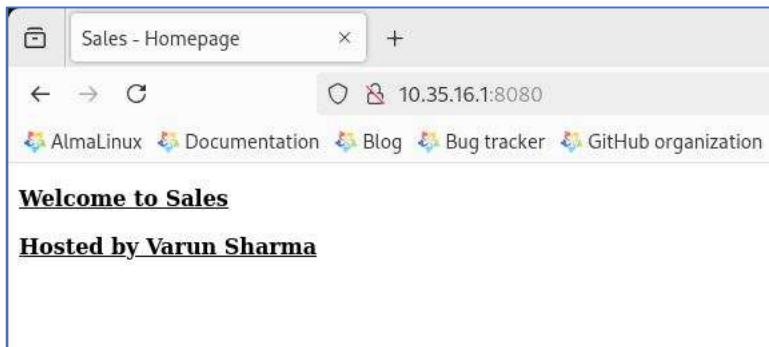
- Virtual servers to create:
 - **Sales** server on port **8080**.

```
<!doctype html>
<html>
  <head>
    <title> Sales - Homepage </title>
  </head>
  <body>
    <p><u><b>Welcome to Sales</b></u></p>
    <p><u><b>Hosted by Varun Sharma</b></u></p>
  </body>
</html>
```

Index File:

```
<VirtualHost 10.35.16.1:8080>
  DocumentRoot /var/www/virtuals/q4/sales
  ServerName sales.com
  ServerAlias www.sales.com
  ErrorLog /var/www/virtuals/q4/sales/logs/error_log
  TransferLog /var/www/virtuals/q4/sales/logs/access_log
</VirtualHost>
```

Conf File:



Website:

- **Admin** server on port **8081**.

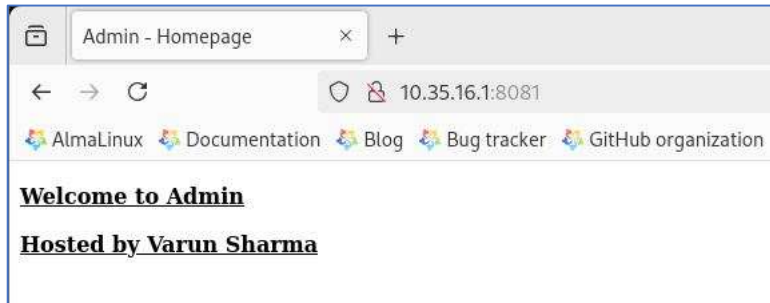
```
<!doctype html>
<html>
  <head>
    <title> Admin - Homepage </title>
  </head>
  <body>
    <p><u><b>Welcome to Admin</b></u></p>
    <p><u><b>Hosted by Varun Sharma</b></u></p>
  </body>
</html>
```

Index File:

Conf File:

```
<VirtualHost 10.35.16.1:8081>
    DocumentRoot /var/www/virtuals/q4/admin
    ServerName admin.com
    ServerAlias www.admin.com
    ErrorLog /var/www/virtuals/q4/admin/logs/error_log
    TransferLog /var/www/virtuals/q4/admin/logs/access_log
</VirtualHost>
```

Website:



- **Thing** server on port **8082**.

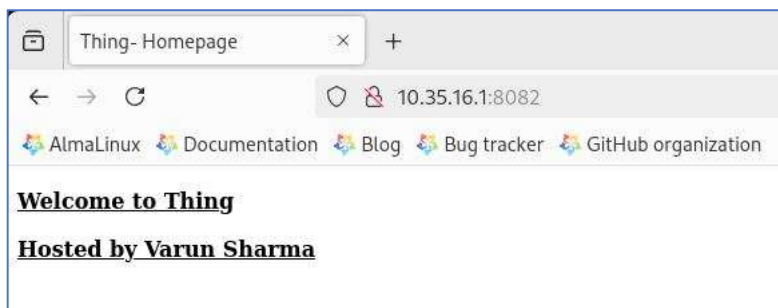
Index File:

```
<!doctype html>
<html>
    <head>
        <title> Thing- Homepage </title>
    </head>
    <body>
        <p><u><b>Welcome to Thing</b></u></p>
        <p><u><b>Hosted by Varun Sharma</b></u></p>
    </body>
</html>
```

Conf File:

```
<VirtualHost 10.35.16.1:8082>
    DocumentRoot /var/www/virtuals/q4/thing
    ServerName thing.com
    ServerAlias www.thing.com
    ErrorLog /var/www/virtuals/q4/thing/logs/error_log
    TransferLog /var/www/virtuals/q4/thing/logs/access_log
</VirtualHost>
```

Website:



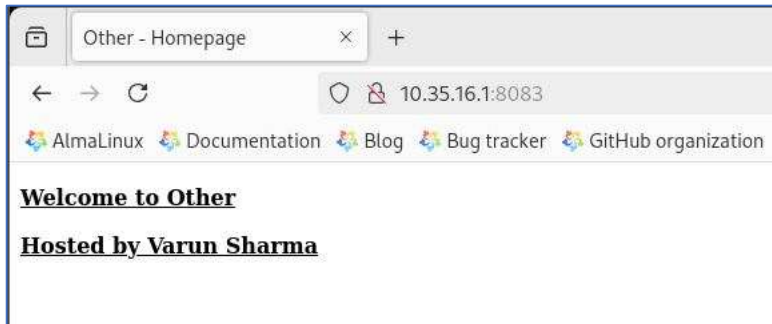
- **Other** server on port **8083**.

```
<!doctype html>
<html>
  <head>
    <title> Other - Homepage </title>
  </head>
  <body>
    <p><u><b>Welcome to Other</b></u></p>
    <p><u><b>Hosted by Varun Sharma</b></u></p>
  </body>
</html>
```

Index File:

```
<VirtualHost 10.35.16.1:8083>
  DocumentRoot /var/www/virtuals/q4/other
  ServerName other.com
  ServerAlias www.other.com
  ErrorLog /var/www/virtuals/q4/other/logs/error_log
  TransferLog /var/www/virtuals/q4/other/logs/access_log
</VirtualHost>
```

Conf File:



Website:

TASK 5 – DYNAMIC VIRTUAL HOSTING

- Server IP address: 10.50.1.1
- You are required to configure your Apache web server to support six virtual servers using only one **<VirtualHost>** block and the **VirtualDocumentRoot** directive.
- Virtual Servers to Configure:

Server Name	IP Address
www.itmt.com	10.50.1.1
www.itmt.ca	10.50.1.1
www2.itmt.com	10.50.1.1
www.montmo.com	10.50.1.1

www.montmo.ca	10.50.1.1
----------------------	-----------

- Each website will have its own **directory** based on the following path format:

/var/www/virtuals/q5/x/y/z/

Where:

- x = TLD of the domain (com or ca).
- y = The name of the company.
- z = The prefix before the domain (e.g., www, www2).
- For example, **www.itmt.com**, the full directory would be:
/var/www/virtuals/q5/com/itmt/www/
- All virtual host errors should be logged to:
- / var/www/virtuals/q5/logs/virtual_error_q5_log**

```
[root@server18 q5]# tree
.
├── ca
│   ├── itmt
│   │   └── www
│   │       └── index.html
│   └── montmo
│       └── www
│           └── index.html
├── com
│   ├── itmt
│   │   ├── www
│   │   │   └── index.html
│   │   └── www2
│   │       └── index.html
│   └── montmo
│       └── www
│           └── index.html
└── logs
    ├── virtual_access_q5_log
    └── virtual_error_q5_log
```

```
<VirtualHost 10.50.1.1>
  UseCanonicalName off
  VirtualDocumentRoot /var/www/virtuals/q5/%3/%2/%1
  ErrorLog /var/www/virtuals/q5/logs/virtual_error_q5_log
  TransferLog /var/www/virtuals/q5/logs/virtual_access_q5_log
</VirtualHost>
```

```
<!doctype html>
<html>
  <head>
    <title> www.itmt.com - Homepage </title>
  </head>
  <body>
    <p><u><b>Welcome to www.itmt.com</b></u></p>
    <p><u><b>Hosted by Varun Sharma</b></u></p>
  </body>
</html>
```

```
<!doctype html>
<html>
  <head>
    <title> www2.itmt.com - Homepage </title>
  </head>
  <body>
    <p><u><b>Welcome to www2.itmt.com</b></u></p>
    <p><u><b>Hosted by Varun Sharma</b></u></p>
  </body>
</html>
```

```
<!doctype html>
<html>
  <head>
    <title> www.montmo.com - Homepage </title>
  </head>
  <body>
    <p><u><b>Welcome to www.montmo.com</b></u></p>
    <p><u><b>Hosted by Varun Sharma</b></u></p>
  </body>
</html>
```

```
<!doctype html>
<html>
  <head>
    <title> www.itmt.ca - Homepage </title>
  </head>
  <body>
    <p><u><b>Welcome to www.itmt.ca</b></u></p>
    <p><u><b>Hosted by Varun Sharma</b></u></p>
  </body>
</html>
```

```
<!doctype html>
<html>
  <head>
    <title> www.montmo.ca - Homepage </title>
  </head>
  <body>
    <p><u><b>Welcome to www.montmo.ca</b></u></p>
    <p><u><b>Hosted by Varun Sharma</b></u></p>
  </body>
</html>
```

