Virtual Hosts

1. Introduction

Using Apache Virtual Host, you can run several websites on the same server.

There are three types of Apache virtual host configurations: 1) IP-Based Virtual Host, 2) Name-based Virtual Host and 3) Port-Based Virtual Host. Name-based virtual host is recommended for most scenarios.

2. Preparation

To test the virtual hosts that we will create next, we have to make some new folders for the new websites.

Create some folders anywhere you want, for instance in the /home/username/ for Linux or My Documents/ for Windows.

3. IP-Based Virtual Host

In the /home/username/ directory for Linux users or in the My Documents/ directory for the Windows users, create two folders; one named ip_external and the other ip_internal. These two folders will be websites in the same server, but will be accessed by different IP addresses, as in this case the internal and the external IP address of the server.

In the folders create index.html or index.php files with any content that you want to be displayed on the pages. Now we have to create the virtual host for these two websites.

Note: This example requires a server that has two IP addresses.

Let us suppose we have a machine with 2 IP addresses such as: 217.24.251.197 as an external IP address (IP that is accessed from outside the local network of the server), and 10.0.51.116 as an internal IP address.

- ***Linux:***
  Go to the /etc/apache2 directory and run ls. You will see sites-available and sites-enabled folders; these folders have the configuration file for the virtual hosts. There are two ways to create virtual host files, one is to create the file in the sites-available and then enabling it with a2ensite command, or create the virtual host file inside the sites-enabled.
  Let us create the virtual-host file in the sites-available firs; go to the sites-available folder by running cd. If you run ls inside this folder you can find a file named 000-default.conf; this is the default configuration file for the sites, to create another

configuration file let us copy the default file and edit it. Run the cp (copy) command and create ip_external.conf file:

sudo cp 000-default.conf ip_external.conf

Now with nano (or any other editor) edit the ip_external.conf file; do not forget to use sudo to gain root privileges for this operation. If we remove the comments, we have:

```
<VirtualHost *:80>
        ServerAdmin webmaster@localhost
        DocumentRoot /var/www/html
        ErrorLog ${APACHE_LOG_DIR}/error.log
        CustomLog ${APACHE_LOG_DIR}/access.log combined
</VirtualHost>
```

<VirtualHost> tags define the virtual host, and the contents inside these tags are the configurations for the virtual host. The *:80 specifies that this virtual host is any address and can be accessed through the port 80. ServerAdmin is the email of the server administration; DocumentRoot is the path of the website folder, for our server we have to change it to /home/userName/ip_external since this is the folder of our website. The ErrorLog and the CustomLog are the log files for any error or custom errors that happen to this virtual host.
Now we have to bind the virtual host to an IP. To make this change the * to the IP address, in this case we have to use 217.24.251.197

```
<VirtualHost 217.24.251.197:80>
        ServerAdmin webmaster@localhost
        DocumentRoot /home/user1/ip_external
        ErrorLog /home/user1/ip_external/error.log
        CustomLog /home/user1/ip_external/access.log combined
</VirtualHost>
```

Close and save the file.
Since we created this conf file inside the sites-available, now we have to enable it.
Run the command *a2ensite ip_external.conf*
The a2ensite command creates a symbolic link in the sites-enabled folder and enables the virtual-host.
Restart the apache service: *service apache2 restart*

Now let us create another virtual host for the ip_internal; in this case let us create the conf file directly inside the sites-enabled folder.

Copy the 000-default.conf from the sites-available to the sites-enabled with the name ip_internal.conf and change the DocumentRoot and the *; the conf should look like this:

```
<VirtualHost 10.0.51.116:80>
        ServerAdmin webmaster@localhost
        DocumentRoot /home/user1/ip_internal
        ErrorLog /home/user1/ip_internal/error.log
        CustomLog /home/user1/ip_internal/access.log combined
</VirtualHost>
```

Close and save the file. Since we created it inside the sites-enabled folder, we do not need to enable it with a2enside, it is enabled by default.

- ***Windows:***

Go to the apache directory in the installation drive. In my case it is: C:\xampp\apache\ and open the conf folder. Here you have all the apache configuration files such as httpd.conf. To create virtual hosts we have to edit a file which is inside the extra directory; open the extra directory and edit the httpd-vhosts.conf file. In here we may add all the virtual host configurations; to add the configuration for the external ip, add the following:

```
<VirtualHost 217.24.251.197:80>
        ServerAdmin webmaster@localhost
        DocumentRoot C:\Users\User\Documents\ip_external
        ErrorLog C:\Users\User\Documents\ip_external\error.log
        CustomLog C:\Users\User\Documents\ip_external\access.log combined
</VirtualHost>
```

And for the internal IP website:

```
<VirtualHost 10.0.51.116:80>
        ServerAdmin webmaster@localhost
        DocumentRoot C:\Users\User\Documents\ip_internal
        ErrorLog C:\Users\User\Documents\ip_internal\error.log
        CustomLog C:\Users\User\Documents\ip_internal\access.log combined
</VirtualHost>
```

4. Name-Based Virtual Host

Name-Based VH are the same as the IP-based, but instead of assigning different websites to each IP, we assign different websites to different names in the same IP.

To make a Name-Based VH let us create some websites. In the /home directory or on the My Documents/ directory create two folders which will be our new websites; name the directories as: SiteOne and the other as: AnotherSite.

Now open the virtual host file; create another configuration by copying the default config in Linux (/etc/apache2/sites-available\), or open httpd-hosts.conf in the Window (C:\xampp\apache\conf\extra\).

In Linux you would have the following (without the comments):

```
<VirtualHost *:80>

        ServerAdmin webmaster@localhost

        DocumentRoot /var/www/html

        ErrorLog ${APACHE_LOG_DIR}/error.log

        CustomLog ${APACHE_LOG_DIR}/access.log combined

</VirtualHost>
```

Now let us introduce to another property; The ServerName property tells the virtual host the name of the Server or of the Website (Virtual-Host). Add the ServerName inside the VirtualHost tags with the value of: www.siteOne.com. Also change the DocumentRoot to the folder of SiteOne:

```
<VirtualHost *:80>

        ServerAdmin webmaster@localhost

         ServerName www.siteOne.com

        DocumentRoot /home/user1/SiteOne

        ErrorLog /home/user1/SiteOne/error.log

        CustomLog /home/user1/SiteOne/access.log combined

</VirtualHost>
```

For Windows you have to write the same in the httpd-vhosts.conf file, but change the DocumentRoot to the appropriate one:

```
<VirtualHost *:80>
        ServerAdmin webmaster@localhost
        ServerName www.siteOne.com
        DocumentRoot C:\Users\User\Documents\SiteOne
        ErrorLog C:\Users\User\Documents\SiteOne\error.log
        CustomLog C:\Users\User\Documents\SiteOne\access.log combined
</VirtualHost>
```

You may also add another property named ServerAlias with the value of siteOne.com; This tells the server that it may access this virtual host without the www.

Now we must assign the Virtual-Host to all the IP addresses; to do this write the following before the <VirtualHost> tag:

```
NameServer *:80
```

This tells the VirtualHost to assign the NameServer to all the IP's in the machine and listen to the port 80.

Note: Since the folder of the website is outside the /var/www/html/ we must assign some directory properties to the folder:

```
<Directory /home/user1/siteone/>
        Options Indexes FollowSymLinks
        AllowOverride FileInfo
        Require all granted
</Directory>
```

To test the newly created website from windows, go to the C:\Windows\System32\drivers\etc and edit **with administrator rights** the hosts file (Right Click the notepad and click Run as Administrator; then browse the hosts file to edit):

Add the IP address of the server following the name of the server

192.168.218.129 www.siteOne.com

Open a web browser and test the www.siteOne.com

The hosts file in Linux is in /etc/hosts

5. Port-Based Virtual Host

On the port-based virtual hosts, instead of creating many different websites with different names we may create different websites with the same name but on different ports. To do so create some website folders the same way as in the Name-Based Virtual Hosts (I created site1 and site2) and edit or create a new Virtual Host configuration file.

Before we write the <VirtualHost> tags we have to tell the server to listen to the new ports:

On Linux edit the /etc/apache2/ports.conf file. In this file we tell the server at which ports to listen. By default, apache has Listen 80 written in the configuration file; this tells the server to listen on the port 80 for a website.

Add another port listening, for example:

```
Listen 8080
```

Save and close the file.

On Windows, open the httpd-vhosts.conf file and add there:

```
Listen 8080
```

Now we are ready to set up the Virtual Host. First of all we must assign the NameServer to ports 80 and 8080; Write the following lines:

```
NameServer *:80

NameServer *:8080
```

Now let us create the virtual hosts:

For linux:

```
<VirtualHost *:80>
        ServerAdmin webmaster@localhost
        ServerName www.site.com
        DocumentRoot /home/user1/Site1
        ErrorLog /home/user1/Site1/error.log
        CustomLog /home/user1/Site1/access.log combined
</VirtualHost>
```

```
<VirtualHost *:8080>
        ServerAdmin webmaster@localhost
        ServerName www.site.com
        DocumentRoot /home/user1/Site2
        ErrorLog /home/user1/Site2/error.log
        CustomLog /home/user1/Site2/access.log combined
</VirtualHost>
```

For Windows:

```
<VirtualHost *:80>
        ServerAdmin webmaster@localhost
        ServerName www.site.com
        DocumentRoot C:\Users\User\Documents\Site1
        ErrorLog C:\Users\User\Documents\Site1\error.log
        CustomLog C:\Users\User\Documents\Site1\access.log combined
</VirtualHost>
<VirtualHost *:8080>
        ServerAdmin webmaster@localhost
        ServerName www.site.com
        DocumentRoot C:\Users\User\Documents\Site2
        ErrorLog C:\Users\User\Documents\Site2\error.log
        CustomLog C:\Users\User\Documents\Site2\access.log combined
</VirtualHost>
```

Note: Since the folder of the website is outside the /var/www/html/ we must assign some directory properties to the folder:

```
<Directory /home/user1/Site1/>
        Options Indexes FollowSymLinks
        AllowOverride FileInfo
        Require all granted
</Directory>
```

```
<Directory /home/user1/Site2/>

        Options Indexes FollowSymLinks

        AllowOverride FileInfo

        Require all granted

</Directory>
```

Edit the hosts file for this new websites; the Site1 can be accessed through the www.site.com and the Site2 can be accessed through the www.site.com:8080