

Scenario

Isobar is a small private club that permits members only to use their services. A guest must be at least 18 years old to become a member. There are three different types of memberships: Temporary, Silver and Gold. Each Type of memberships has different benefits and when a guest signs up for a membership, they have verified that they recognize all the benefits they receive. The Temporary membership is valid for 7 days only while the Silver and Gold memberships are both valid for one year. Temporary, Silver and Gold members receive 0%, 3%, and %5 discount for all orders that they make at Isobar. A temporary membership cannot be issued more than three times a year to the same person. All sales information is stored for record-keeping.

Technologies Required

- **Virtual Directories**

After installing WAMP, websites can only run if they are placed in the default “www” folder. Virtual Directories will be created as an alias or path within a website that refers users to another directory (“c:wamp64\Isobar”) where the data is hosted.

- **Virtual Servers**

Virtual Host will be used to give Isobar a domain name. So instead of only being able to access the Isobar website at “localhost/isobar/”, we will also be able to access it at “<http://www.isobar.org/>” or “<http://127.0.0.3/>”

- **PHP (v. 7.3.12)**

PHP will be responsible for all work related to server-side scripting. For example, it will be used for accounting and managing emails.

- **MySQL (v. 8.0.18)**

MySQL will be used as a database to store some important information such as the name of am Isobar member and the member’s membership type.

- **HTTP Authentication**

HTTP Authentication will be used to restrict access to confidential data (such as the log analysis files of the site) to the site administrators.

- **SSL Certificates**

SSL Certificates will be created on the main site (www.isobar.org) to ensure secure connections from the webserver to the browser.

- **CGI Application**

CGI will be used to process requests (e.g. a member requests to reserve a table at Isobar) and generate a response as HTML. It can be used to display the Awstats log file analysis.

- **PHP Application**

A PHP Application is just a script that could be used to render the website itself e.g. index.php.

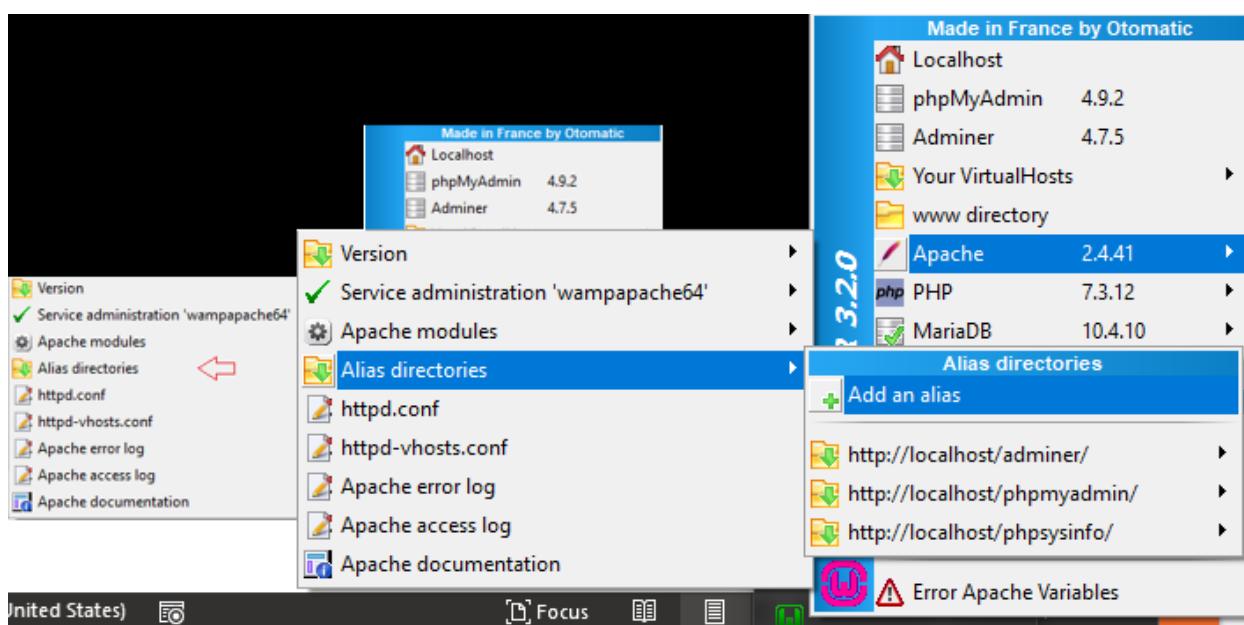
Documentation: How to ...

- **WAMP (v. 3.2.0)**

The WAMP server was downloaded from <http://www.wampserver.com/en/download-wampserver-64bits/> and Apache 2.4.41, PHP 7.3.12, and MySQL 8.0.18 were installed as part of the setup.

- **Virtual Directories**

- Click on the WAMP server icon
- Then go to “Apache” > “Alias directories” > “Add an alias”



You will be asked to give an alias to the site and to enter a destination path of your alias.

- The name for our alias is “Isobar” and the destination path is “C:/wamp64/Isobar/”. Make sure to use forward slashes for the destination path.

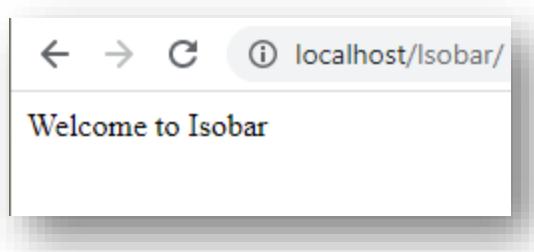
```
Enter your alias.
For example,
'test'

would create an alias for the url
http://localhost/test/
: Isobar
```

```
Enter the destination path of your alias.
For example,
'c:/test/'

would make http://localhost/Isobar/ point to
c:/test/
:
```

- Now, we can view our website at “localhost/Isobar/”.



▪ Virtual Servers

- Go to “localhost” on your browser
- In the tools section, click on “Add a Virtual Host”
- Enter the “name” and the “path” of the virtual host you want to create. You can also Create a virtual Host by IP address.
- To commit the changes, restart your DNS. To do so, right click on the WAMP server ICON on the taskbar > tools > restart DNS.

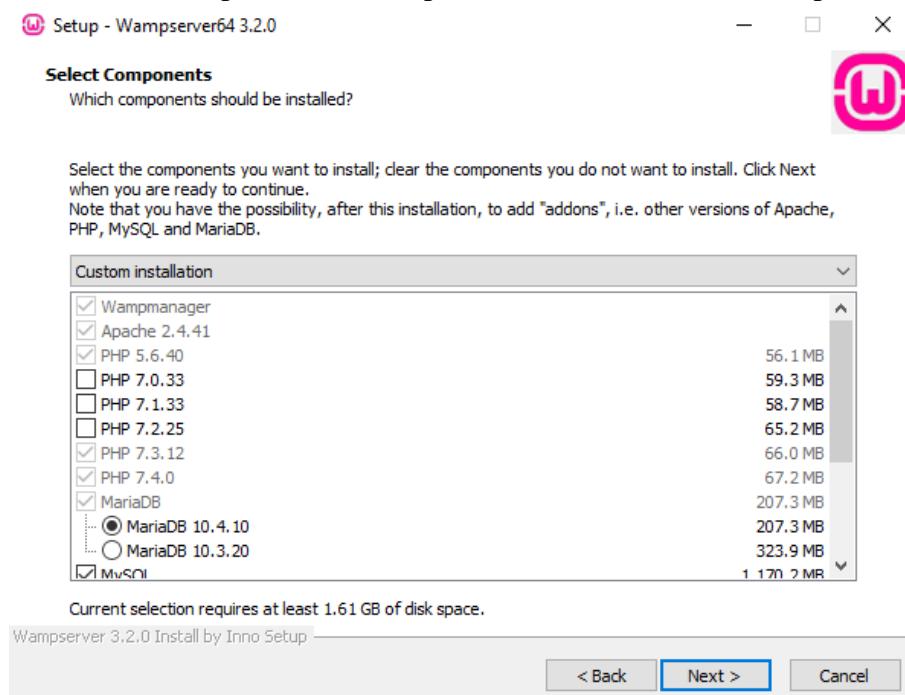
For the purpose of the Isobar website, we have four virtual hosts.

VirtualHost already defined:

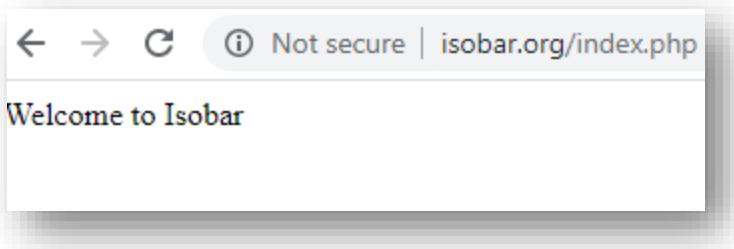
```
ServerName : localhost - Directory : c:/wamp64/www
ServerName : isobar - Directory : c:/wamp64/isobar - VirtualHost ip = 127.0.0.3
ServerName : www.isobar.org - Directory : c:/wamp64/isobar
ServerName : www.isobar.org.awstats - Directory : c:/wamp64/isobar/awstats
```

▪ PHP (v. 7.3.12)

PHP 7.3.12 was pre-installed as part of the WAMP Server setup.



A test carried out to show if PHP was working was successful.



- **MySQL (v. 8.0.18)**

Just like PHP, MySQL 8.0.18 was pre-installed as part of the WAMP server setup.

However, the default username for our database is “root” it is not passworded.

- To secure the database, go to “localhost” on your browser and choose “phpMyAdmin”. You will be taken to the phpMyAdmin login.
- Input “root” as the username and leave the password empty. Click “Go”
- Once logged in, click “Change password” under “General settings”. Now you can input a password.

The screenshot shows a "Change password" dialog box. It has two radio button options: "No Password" (unchecked) and "Password" (checked). Under "Password", there are two input fields: "Enter:" and "Re-type:". A strength meter indicates the password is "Good". Below these fields is a dropdown menu for "Password Hashing" set to "Native MySQL authentication". At the bottom left is a "Generate password" button with a "Generate" link, and at the bottom right are "Go" and "Cancel" buttons.

- **HTTP Authentication**

To setup Authentication on Isobar’s log file analyzer statistics, first:

- Open a new text file and type the following:

```
AuthType Basic  
AuthName "Restricted access"  
AuthUserFile "C:/wamp64/pwds/.htpasswd"  
require valid-user
```

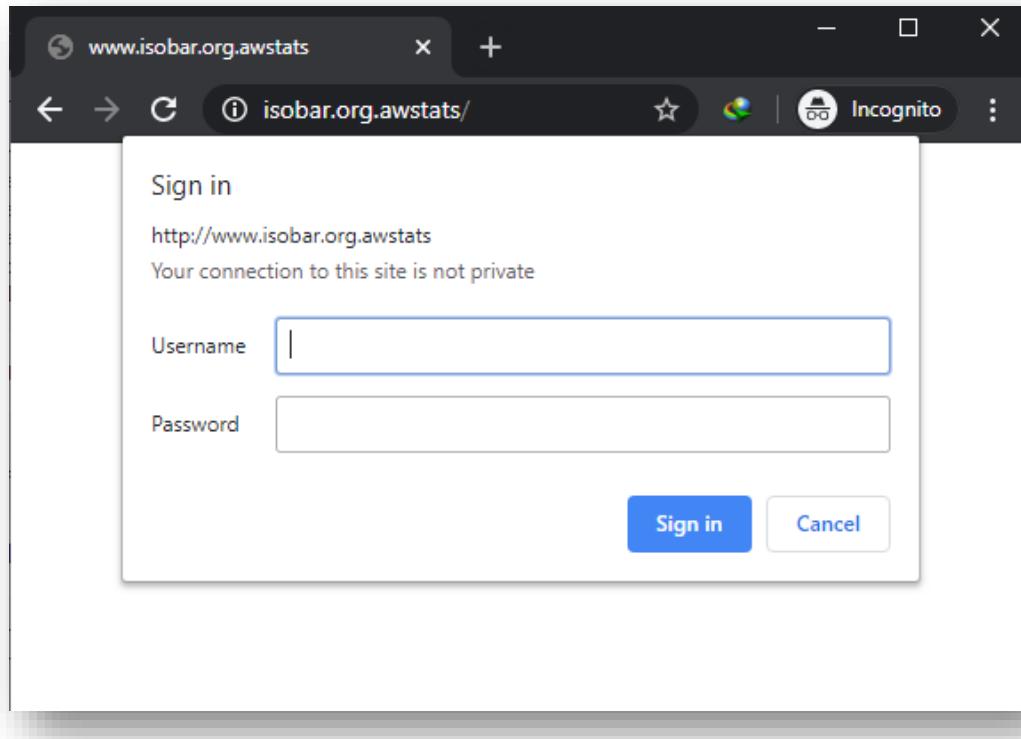
- Save the file as “.htaccess”.
- Open the command line and navigate to the “.htpasswd.exe” file located in the “C:/wamp64/bin/apache/apache2.4.41/bin” directory.
- Now type the following command to create a username and password in the “C:/wamp64/pwds” directory.

```
htpasswd -c C:/wamp64/pwds/.htpasswd Admin
```

You will be prompted to enter and re-enter a password for “Admin”. An encrypted version of the entered password will be stored in the “.htpasswd” file generated.

```
C:\wamp64>cd bin/apache/apache2.4.41/bin  
C:\wamp64\bin\apache\apache2.4.41\bin>htpasswd -c .htpasswd Admin  
New password: *****  
Re-type new password: *****  
Adding password for user Admin  
  
C:\wamp64\bin\apache\apache2.4.41\bin>htpasswd -c C:/wamp64/pwds/.htpasswd Admin  
  
New password: *****  
Re-type new password: *****  
Adding password for user Admin
```

- Now, when we try to access <http://www.isobar.org.awstats/>, we get an authentication prompt from the browser.



- **SSL Certificates (OpenSSL v. 1.1.0L)**

The 64 bits OpenSSL for Windows recommended for developers were downloaded from <https://slproweb.com/products/Win32OpenSSL.html> and the program was installed.

- Now, we create a private key by opening the command line and going to the “C:\wamp64\bin\apache\apache2.4.41\bin” directory where “openssl.exe” is located and inputting:

`OpenSSL RSA -in private.key -out private.key`

You will be prompted for a passphrase.

- Back up the private key with
`copy private.key private.key.backup`
- WAMP does not support passphrases for key so, remove the passphrase using

```
OpenSSL RSA -in private.key.backup -out private.key
```

- Create the certificate with

```
OpenSSL req -new -x509 -sha1 -key private.key -out  
certificate.crt -days 36500 -config  
C:\wamp64\bin\apache\apache2.4.41\conf\openssl.cnf333
```

- Create a new folder called “key” in the “C:\wamp64\bin\apache\apache2.4.41\conf” directory and copy and paste the private key and certificate into the key folder.
- Open “httpd.conf” file in the “C:\wamp64\bin\apache\apache2.4.41\conf” directory and uncomment the following lines:

```
LoadModule ssl_module modules/mod_ssl.so  
Include conf/extra/httpd-ssl.conf  
LoadModule socache_shmcb_module modules/mod_socache_shmcb.so
```

- Open the “php.ini” file in the “C:\wamp64\bin\php\php7.3.12” directory and uncomment the following line:
`extension=php_openssl.dll`
- Edit the “httpd-ssl.conf” file in the “c:/wamp64/bin/apache/apache2.4.41/conf/extra/” directory by changing the parameters in the lines as shown below:

```
DocumentRoot "c:/wamp64/www"  
ServerName localhost:443  
ServerAdmin admin@example.com  
ErrorLog "${SRVROOT}/logs/error.log"  
TransferLog "${SRVROOT}/logs/access.log"  
SSLCSessionCache "shmcb:${SRVROOT}/logs/ssl_scache(512000)"  
SSLCertificateFile "${SRVROOT}/conf/key/certificate.crt"  
SSLCertificateKeyFile "${SRVROOT}/conf/key/private.key"  
CustomLog "${SRVROOT}/logs/ssl_request.log"
```

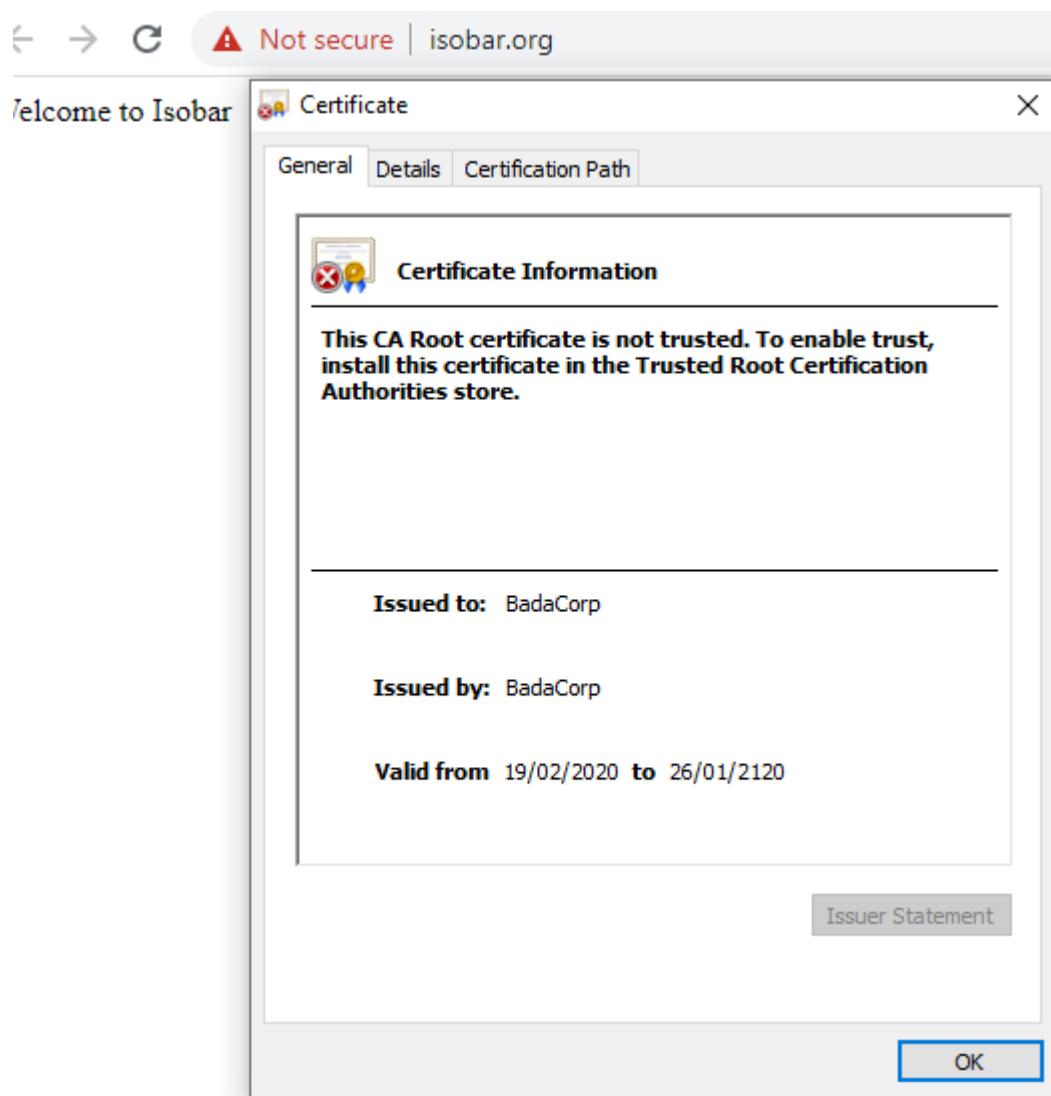
- Open the “httpd-vhosts.conf” file and replace the following lines of the virtual host (www.isobar.org) on which you would like to force HTTPS

```
#Options +Indexes +Includes +FollowSymLinks +MultiViews  
#AllowOverride All  
#Require local
```

With this:

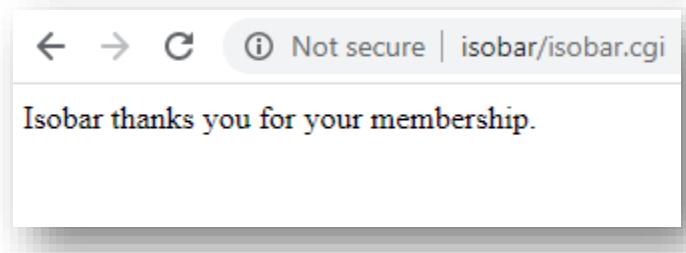
```
RewriteCond %{HTTP_HOST} ^www.isobar.org [NC]  
RewriteCond %{HTTPS} off  
RewriteRule ^(.*)$ https:// %{HTTP_HOST}%{REQUEST_URI}  
[R=301,L]
```

- Restart the WAMP server and you have a certificate associated with the www.isobar.org



- **CGI Application**

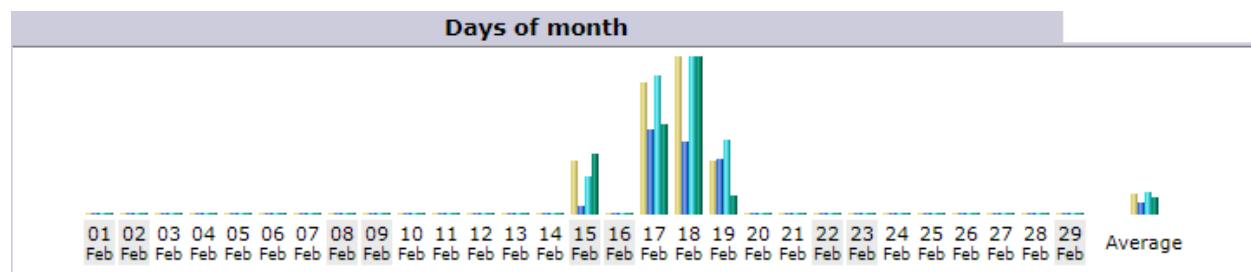
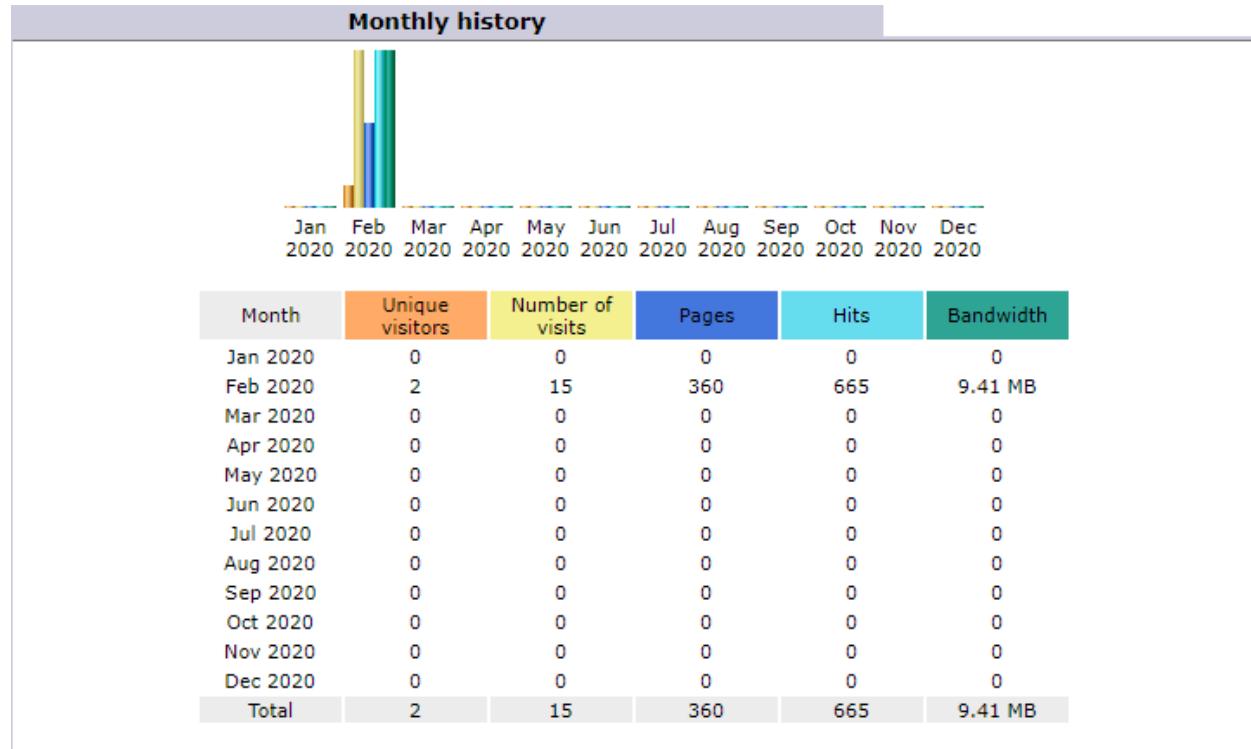
- To install CGI, simply open the “httpd.conf” file and uncomment the line:
`AddHandler cgi-script .cgi`
Now you can test your CGI script.



Awstats log

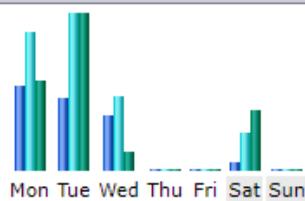
Summary					
Reported period	Month Feb 2020				
First visit	15 Feb 2020 - 19:00				
Last visit	19 Feb 2020 - 20:09				
	Unique visitors	Number of visits	Pages	Hits	Bandwidth
Viewed traffic *	2	15 (7.5 visits/visitor)	360 (24 Pages/Visit)	665 (44.33 Hits/Visit)	9.41 MB (642.41 KB/Visit)
Not viewed traffic *			30	269	16.17 MB

* Not viewed traffic includes traffic generated by robots, worms, or replies with special HTTP status codes.

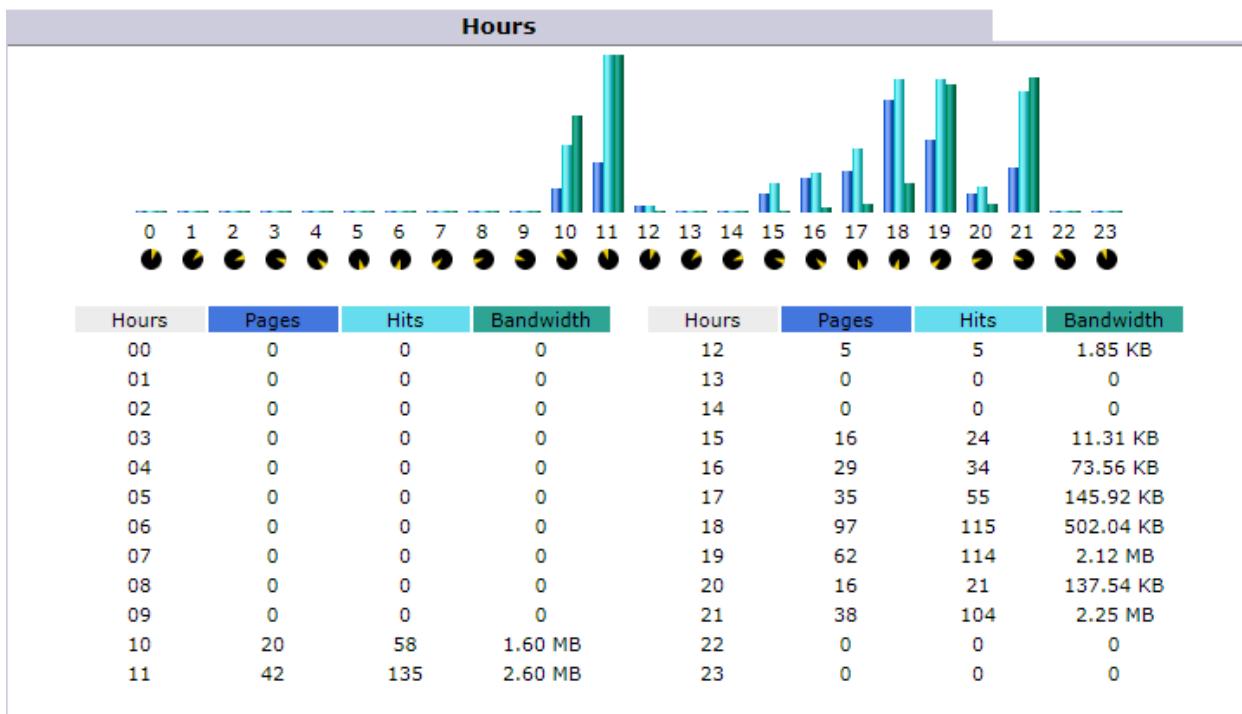


Day	Number of visits	Pages	Hits	Bandwidth
01 Feb 2020	0	0	0	0
02 Feb 2020	0	0	0	0
03 Feb 2020	0	0	0	0
04 Feb 2020	0	0	0	0
05 Feb 2020	0	0	0	0
06 Feb 2020	0	0	0	0
07 Feb 2020	0	0	0	0
08 Feb 2020	0	0	0	0
09 Feb 2020	0	0	0	0
10 Feb 2020	0	0	0	0
11 Feb 2020	0	0	0	0
12 Feb 2020	0	0	0	0
13 Feb 2020	0	0	0	0
14 Feb 2020	0	0	0	0
15 Feb 2020	2	14	61	1.73 MB
16 Feb 2020	0	0	0	0
17 Feb 2020	5	138	227	2.60 MB
18 Feb 2020	6	118	257	4.57 MB
19 Feb 2020	2	90	120	522.37 KB
20 Feb 2020	0	0	0	0
21 Feb 2020	0	0	0	0
22 Feb 2020	0	0	0	0
23 Feb 2020	0	0	0	0
24 Feb 2020	0	0	0	0
25 Feb 2020	0	0	0	0
26 Feb 2020	0	0	0	0
27 Feb 2020	0	0	0	0
28 Feb 2020	0	0	0	0
29 Feb 2020	0	0	0	0
Average	0	18	35	507.17 KB
Total	15	360	665	9.41 MB

Days of week



Day	Pages	Hits	Bandwidth
Mon	46	75	888.09 KB
Tue	39	85	1.52 MB
Wed	30	40	174.12 KB
Thu	0	0	0
Fri	0	0	0
Sat	4	20	590.52 KB
Sun	0	0	0



Visits duration

Number of visits: 15 - Average: 1,505 s		Number of visits	Percent
0s-30s		5	33.3 %
30s-2mn			
2mn-5mn			
5mn-15mn		1	6.6 %
15mn-30mn		2	13.3 %
30mn-1h		2	13.3 %
1h+		3	20 %
Unknown		2	13.3 %

Pages-URL (Top 10) - [Full list](#) - [Entry](#) - [Exit](#)

21 different pages-url	Viewed	Average size	Entry	Exit	
/	167	5.38 KB	9	7	
/add_vhost.php	77	5.09 KB	1	1	
/phpmyadmin/	22	4.72 KB	1		
/Isobar/	13	667 Bytes	2	1	
/phpmyadmin/phpmyadmin.css.php	10	20.31 KB		1	
/phpmyadmin/ajax.php	9	1.40 KB			
/phpmyadmin/js/whitelist.php	8	491 Bytes			
/phpmyadmin/js/messages.php	8	8.66 KB			
/phpsysinfo/js.php	8	17.25 KB			
/Isobar/Isobar/	6	17 Bytes		1	
Others	32	6.18 KB	2	2	

HTTP Status codes		Hits	Percent	Bandwidth
404	Document Not Found (hits on favicon excluded)	149	87.6 %	40.91 KB
401	Unauthorized	10	5.8 %	4.82 KB
301	Moved permanently (redirect)	5	2.9 %	1.61 KB
302	Moved temporarily (redirect)	4	2.3 %	8.17 KB
403	Forbidden	2	1.1 %	578 Bytes

Security Concerns

The SSL certificate has not been validated by a Certificate Authority. This is because the server is only for demonstration purposes.

Accounting Issues

Network traffic is too low to utilize for accounting purposes.

Fault management

Sensitive data such as the “.htpasswd” for server authentication was backed up incase the original file is mistakenly deleted or corrupted.

Performance Expectation

The server logs should be monitored regularly to ensure consistent delivery of service.

References

AWStats. (n.d.). *AwStats Installation, Configuration and Reporting*. Retrieved from AwStats logfile analyzer 7.7 Documentation: https://awstats.sourceforge.io/docs/awstats_setup.html

E. B. (2020). *How to Force HTTPS using .htaccess (Updated 2020)*. Retrieved from HOSTINGER TUTORIALS: <https://www.hostinger.com/tutorials/ssl/forcing-https>

Elvitlgala, S. (2009). *Configure a virtual directory using WAMP*. Retrieved from Web Design Library: <https://www.webdesign.org/web-programming/php/configure-a-virtual-directory-using-wamp.16605.html>

Kritika. (2018). *Set up Virtual Host with WAMP*. Retrieved from Codedecode: <http://codedecode.co.in/blog/wordpress/set-up-virtual-host-with-wamp/>

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The Apache Software Foundation. (n.d.). *Authentication and Authorization*. Retrieved from Apache HTTP Server Project: <https://httpd.apache.org/docs/2.4/howto/auth.html>