

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 an 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.

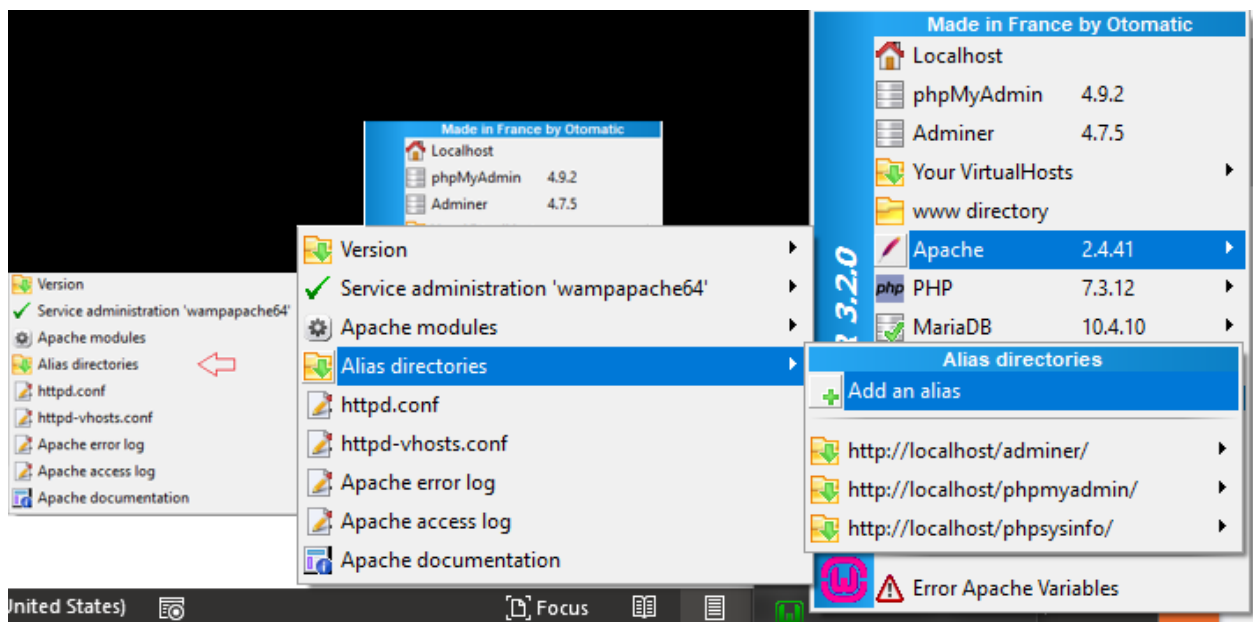
Documentation: How to ...

▪ 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
```

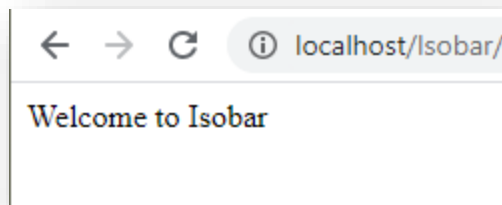
```
Enter the destination path of your alias.
For example,

'c:/test/'

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

:
```

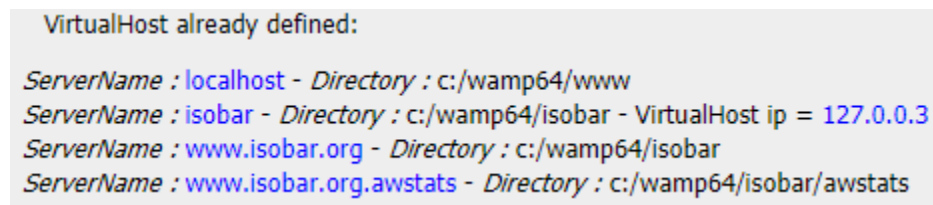
- Now, we can view our website at “localhost/Isobar/”.



Virtual Servers

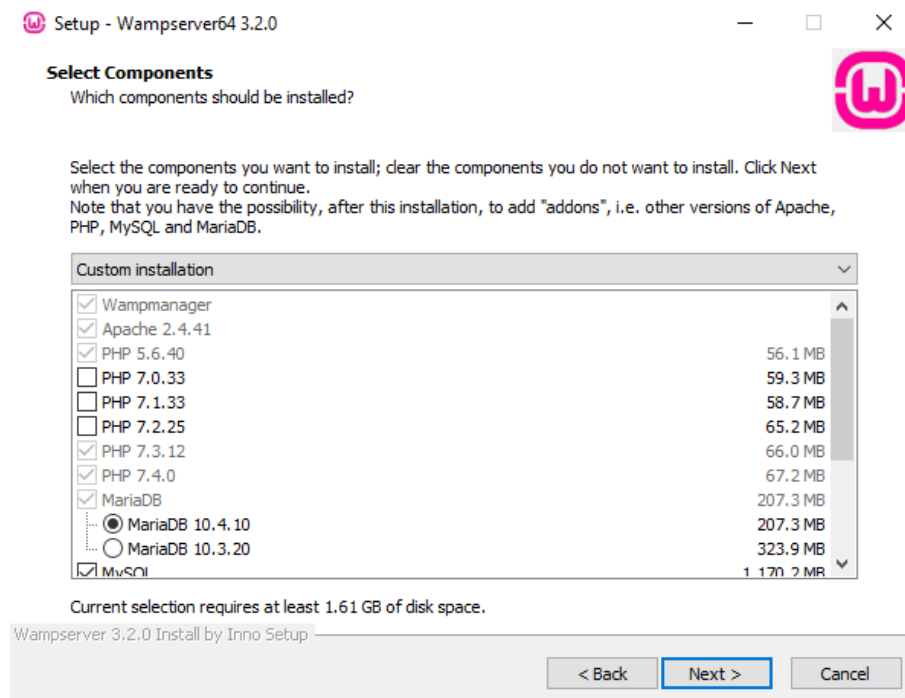
- Go to “localhost” on your browser
- In the tools section, click on “Add a Virtual Host”
- Enter the “name” and the “path” of the virtual host you want to create. You can also Create a virtual Host by IP address.
- To commit the changes, restart your DNS. To do so, right click on the WAMP server ICON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

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

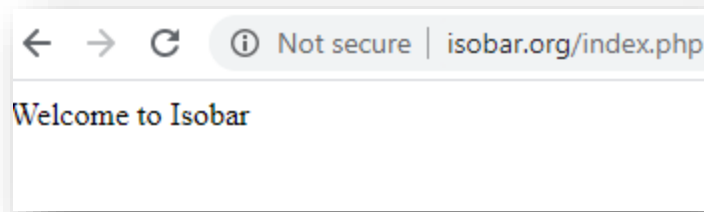


PHP (v. 7.3.12)

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.

A screenshot of the 'Change password' dialog box in phpMyAdmin. It has a title bar 'Change password' with a close button. Below the title bar, there are two radio buttons: 'No Password' and 'Password:'. The 'Password:' option is selected. There are input fields for 'Enter:' and 'Re-type:'. A 'Strength:' indicator shows 'Good'. Below these, there is a 'Password Hashing:' dropdown menu set to 'Native MySQL authentication'. At the bottom, there is a 'Generate password' button and a text input field. At the very bottom right, there 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
```

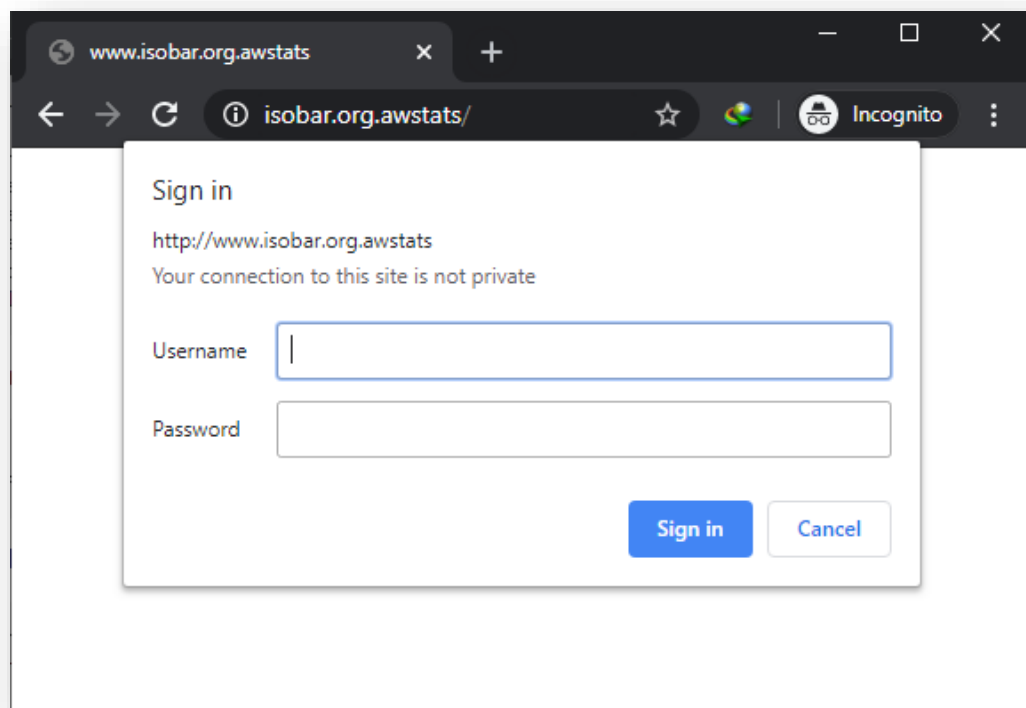
You will be prompted to enter and re-enter a password for “Admin”. An encrypted version of the entered password will be stored in the “.htpasswd” file generated.

```
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:

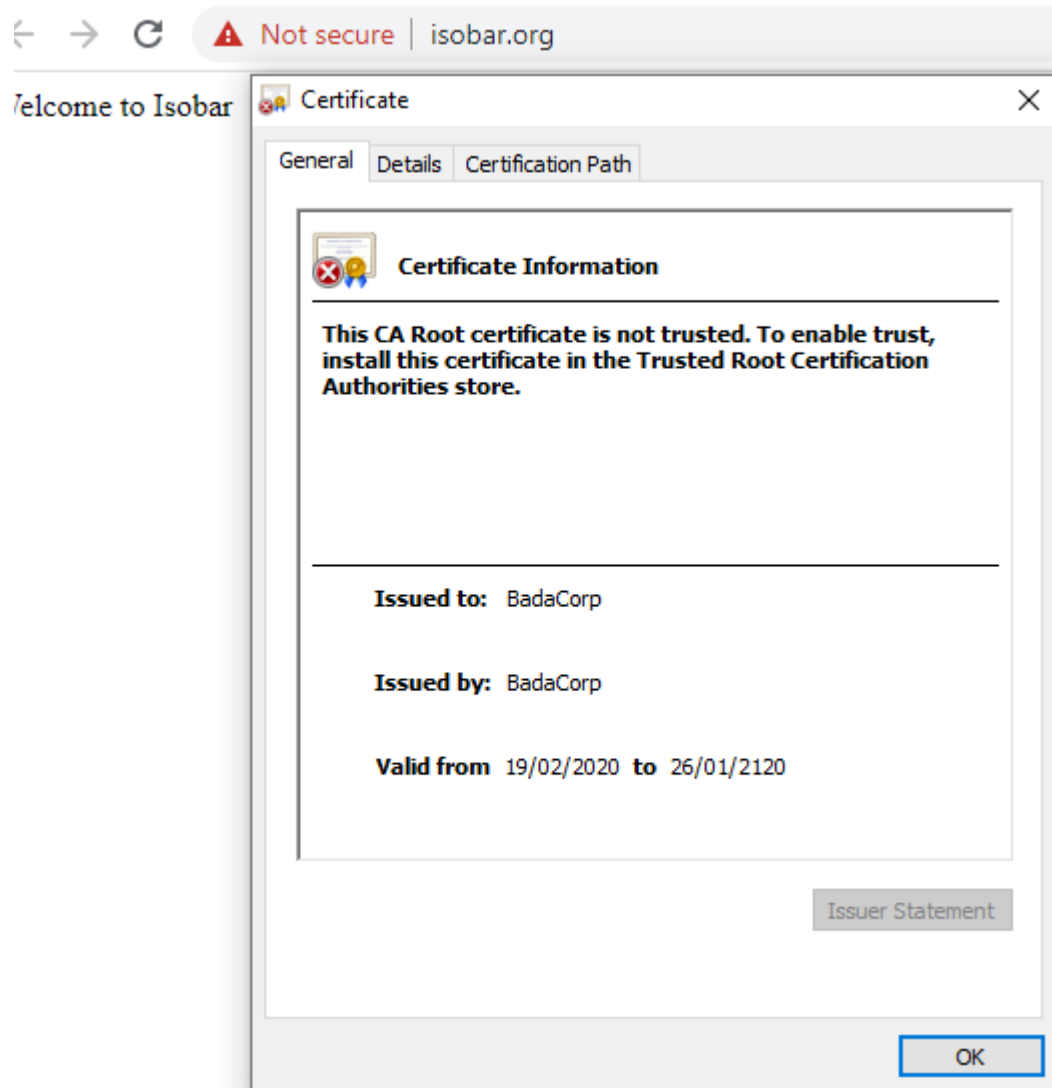
```
extension=php_openssl.dll
```
- Edit the “httpd-ssl.conf” file in the “c:\wamp64\bin\apache\apache2.4.41\conf\extra” directory by changing the parameters in the lines as shown below:

```
DocumentRoot "c:/wamp64/www"
ServerName localhost:443
ServerAdmin admin@example.com
ErrorLog "${SRVROOT}/logs/error.log"
TransferLog "${SRVROOT}/logs/access.log"
SSLSessionCache "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](http://www.isobar.org)) on which you would like to force HTTPS

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

With this:

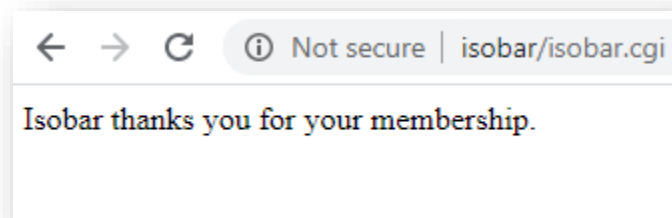
```
RewriteCond %{HTTP_HOST} ^www.isobar.org [NC]
RewriteCond %{HTTPS} off
RewriteRule ^(.*)$ https://%{HTTP_HOST}%{REQUEST_URI}
[R=301,L]
```
- Restart the WAMP server and you have a certificate associated with the [www.isobar.org](http://www.isobar.org)



#### ▪ CGI Application

- To install CGI, simply open the “httpd.conf” file and uncomment the line:  
AddHandler cgi-script .cgi

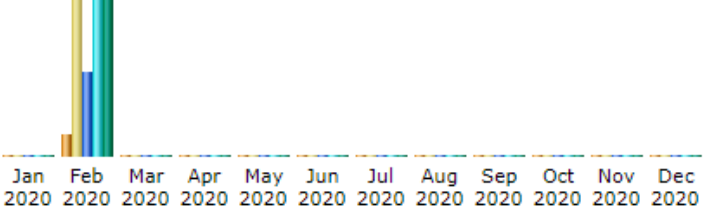
Now you can test your CGI script.

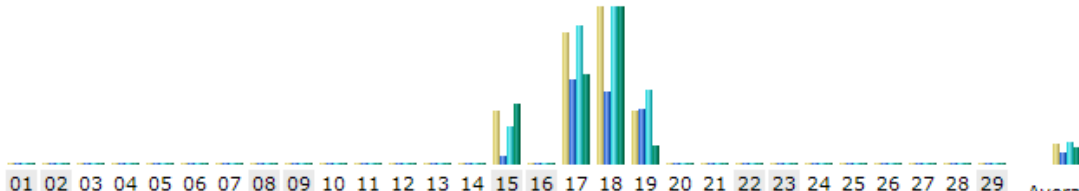


## Awstats log

| Summary                |                     |                            |                         |                           |                              |
|------------------------|---------------------|----------------------------|-------------------------|---------------------------|------------------------------|
| <b>Reported period</b> | Month Feb 2020      |                            |                         |                           |                              |
| <b>First visit</b>     | 15 Feb 2020 - 19:00 |                            |                         |                           |                              |
| <b>Last visit</b>      | 19 Feb 2020 - 20:09 |                            |                         |                           |                              |
|                        | Unique visitors     | Number of visits           | Pages                   | Hits                      | Bandwidth                    |
| Viewed traffic *       | 2                   | 15<br>(7.5 visits/visitor) | 360<br>(24 Pages/Visit) | 665<br>(44.33 Hits/Visit) | 9.41 MB<br>(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.

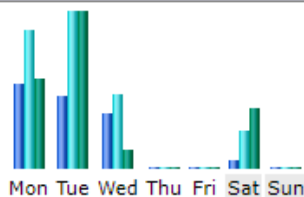
| Monthly history                                                                    |                 |                  |       |      |           |
|------------------------------------------------------------------------------------|-----------------|------------------|-------|------|-----------|
|  |                 |                  |       |      |           |
| Month                                                                              | Unique visitors | Number of visits | Pages | Hits | Bandwidth |
| Jan 2020                                                                           | 0               | 0                | 0     | 0    | 0         |
| Feb 2020                                                                           | 2               | 15               | 360   | 665  | 9.41 MB   |
| Mar 2020                                                                           | 0               | 0                | 0     | 0    | 0         |
| Apr 2020                                                                           | 0               | 0                | 0     | 0    | 0         |
| May 2020                                                                           | 0               | 0                | 0     | 0    | 0         |
| Jun 2020                                                                           | 0               | 0                | 0     | 0    | 0         |
| Jul 2020                                                                           | 0               | 0                | 0     | 0    | 0         |
| Aug 2020                                                                           | 0               | 0                | 0     | 0    | 0         |
| Sep 2020                                                                           | 0               | 0                | 0     | 0    | 0         |
| Oct 2020                                                                           | 0               | 0                | 0     | 0    | 0         |
| Nov 2020                                                                           | 0               | 0                | 0     | 0    | 0         |
| Dec 2020                                                                           | 0               | 0                | 0     | 0    | 0         |
| Total                                                                              | 2               | 15               | 360   | 665  | 9.41 MB   |

| Days of month                                                                        |        |        |        |        |         |
|--------------------------------------------------------------------------------------|--------|--------|--------|--------|---------|
|  |        |        |        |        |         |
| 01 Feb                                                                               | 02 Feb | 03 Feb | 04 Feb | 05 Feb | 06 Feb  |
| 07 Feb                                                                               | 08 Feb | 09 Feb | 10 Feb | 11 Feb | 12 Feb  |
| 13 Feb                                                                               | 14 Feb | 15 Feb | 16 Feb | 17 Feb | 18 Feb  |
| 19 Feb                                                                               | 20 Feb | 21 Feb | 22 Feb | 23 Feb | 24 Feb  |
| 25 Feb                                                                               | 26 Feb | 27 Feb | 28 Feb | 29 Feb | Average |

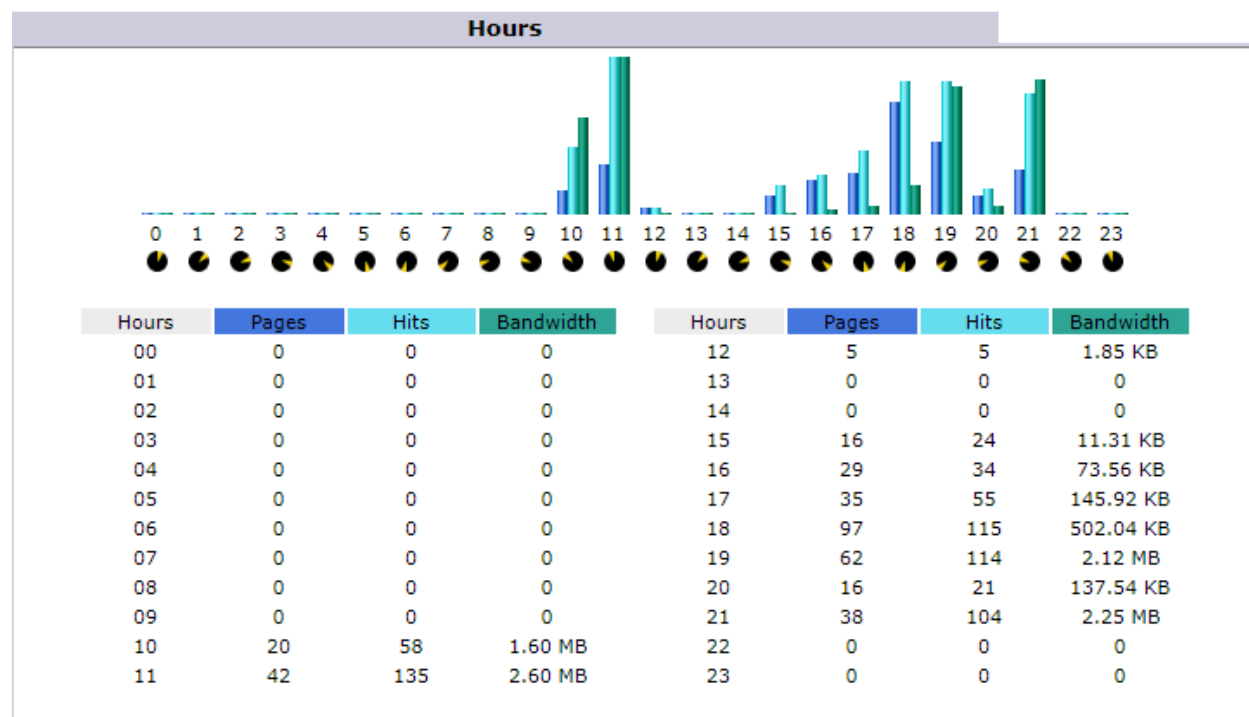


| Day         | Number of visits | Pages | Hits | Bandwidth |
|-------------|------------------|-------|------|-----------|
| 01 Feb 2020 | 0                | 0     | 0    | 0         |
| 02 Feb 2020 | 0                | 0     | 0    | 0         |
| 03 Feb 2020 | 0                | 0     | 0    | 0         |
| 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  |                                               |      |         |           |
|--------------------|-----------------------------------------------|------|---------|-----------|
| 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](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>
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- Roy, P. (2017). *How to Enable Localhost HTTPS (SSL) on WAMP Server (3.0.9)*. Retrieved from Proy's Blog: <https://www.proy.info/how-to-enable-localhost-https-on-wamp-server/>
- 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>