



Performance Analysis of Openlitespeed and Apache Web Servers in Serving Client Requests

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A B S T R A C T

Web server those who use apache are now very familiar to users, because apache is easier to use than other web servers, but runs PHP applications (Hypertext Preprocessor) by handling 100000 requests is certainly very influential on the speed of the web server. Openlitespeed is a web server that functions the same as apache, but server users are more likely to use openlitespeed. This study conducted a performance test on both web servers to find out which web server is very suitable for use in completing client requests. This test uses the <https://webpagetest.org>, <https://gtmetrix.com> and <https://developers.google.com/speed/pagespeed/insights> applications. To do benchmarking of the many diverse client requests. The trial results in the current study provide benchmarking results which result in terms of time usage.

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1. Introduction

Website [1] is an intermediary medium in presenting hypermedia via the internet which has become a necessity. Where the growth of users has shown a drastic increase during this pandemic. Several other studies show that there is more than +75% of data traffic [2] through the internet network which is dominated by Hypertext Transfer Protocol (HTTP). Therefore, planning and providing resources from a web server to serve HTTP-based requests is very important.

Web servers play an important role in this pandemic period to provide services to end users to provide what they need, with WWW (World Wide Web) service techniques [3], then the services provided to users will be client-server based. Client is a user who is in the position of an application that makes a request to the server, this request can be an object in the form of text or documents (files), videos, databases, audio, or other queries. While the server is in the application position that serves client requests and presents data according to the request.

The server is in charge of serving client requests that require a web server to process the request before it will be sent back which is called a response. Apache, Cherokee, Litespeedtech, Openlitespeed, and Apache Tomcat are examples of web server applications commonly used in the world.

Based on the survey, Litespeedtech or Openlitespeed [4] is a web server that is often used by hosting servers that serve a lot of application visits on the web server, but by default, the installation of a web server

on a server based on Linux or Windows still uses the Apache web server. The percentage of Apache usage is 44.2% when compared to Openlitespeed which is 35.5%.

Several previous studies in terms of testing web servers such as this study showed that the apache transfer rate results were superior when compared to the Nginx web server. However, the researcher compares this comparison with the Openlitespeed web server, where currently web server hosting is switching to Openlitespeed. This is because the use of processor and memory on the server is more optimal when compared to Apache (test using the ClearOS operating system) [5]. For this reason, research needs to be carried out between these two web servers, which webserver is superior to use.

This research is testing the web server from the response if the load given by the user is very large or there are many users who access the web server. Bandwidth and response time are very important for users in receiving services from an application that is on a web server, response time is very influential for users if the existing application is very complex, for example, the application used is an electronic application performance on 2 Apache web servers and Openlitespeed. So that a comparison can be made between these two web servers, which one will be superior in processing an existing application. Based on the test results obtained in this study, it can be expected to provide input in choosing which web server should be used later in creating a website system that is used if the website will handle many visits from client requests.

The test was carried out by installing Apache and Openlitespeed on an IBM 3650 Server that uses a Xeon E5-2620 processor and uses the ClearOS 7 operating system. Tools that can be used include Gmetrix, Geekflare, and Google Page Insight, web page tests can be used to test the number of requests to the server and the request load varies.

1.1. Web Server, Operating System and Benchmarking Tools

1.1.1. Apache web server

This is a Unix-based web server, Apache was originally developed with code in NCSA HTTPD 1.3 which was then reprogrammed to become the most widely used web server today. Apache has adequate features starting with good performance, functionality, effectiveness, and speed. Apache is also a web server that is open source.

1.1.2. Openlitespeed

This Web Server is a free version of the technology developed by LiteSpeed Technologies which is proven to be more than 50 times faster than the overall Apache, which is the latest technology rival that provides high performance, fast, stable, lightweight and capable of serving large-scale requests.

1.1.3. ClearOS 7 community version

ClearOS 7 is the development version of the Centos and Redhat variants, which directly provides a web service that manages all hardware and software on the server, but this advantage is not owned by Centos and Redhat, in which there are Firewall settings, SSL Lets Encrypt, DHCP Server, Mail Server, and others that also provide paid facilities whose facilities are more complete than the free version.

ClearOS is a Linux-based operating system that is used as a server. Despite its Linux roots, ClearOS is simple to use even for those unfamiliar with the operating system. Because the configuration system is based on Web GUI.

1.1.4. Pagespeed insight [6]

This tool is a tool created by Google that functions for benchmarking of a website on a web server, this is very familiar if we use it to determine the load time element of an application website.

1.1.5. GTMetrix [7]

This tool is the same as PageSpeed Insight, but testing using GTMetrix is carried out directly with client browsers from abroad, so that with this tool we can compare time requests from various countries with the target web server.

1.1.6. WebPageTest [8]

WebPageTest is complete with a bandwidth test feature and web page load time from various files on a website server, and can also calculate how much CPU usage is on the server and the bandwidth used.

1.2. Superiority of Apache

For those of us who have been in the world of web development, of course, we also know the term Apache. This is because Apache is a type of web server that can run on various operating systems, such as Microsoft Windows, Linux, Unix, Novell Netware, and other platforms that are used to serve and manage web facilities using a protocol known as HTTP (Hypertext Transfer Protocol). The Apache name was chosen to honor the Apache Indian tribes, who used extraordinary warfare skills and strategies.

Initially, Apache was an open source software used only as a replacement for the Netscape web server. However, Apache has grown in popularity since April 1996. Until May 1999, Apache was widely used in a variety of world web servers.

Now, Apache is one of the open-source software, which means that it is supported by developers all over the world, making Apache more maintained and updated on a regular basis with new features and functionality to improve the quality of HTTP service delivery.

1.2.1. Apache functions

Apache has the same function as a web server function in general, which is to obtain a file containing a client's request through a web browser, then Apache will process the data by producing the output desired by the client. The output is obtained based on the data stored in the website database.

Currently, Apache is widely used in a variety of world servers. Clients can use the Apache server to run various scripts and applications. As a result, every web hosted on Apache servers has dynamic content that adheres to current HTTP standards. Furthermore, Apache includes advanced features such as configurable error messages and user authentication, which are supported by a GUI (Graphical User Interface) to make it easier to manage the server.

1.2.2. Apache advantages

Apache is a free and open source web server. This means that the program code on the server can be modified and updated to meet our requirements. As a result, developers from all over the world can contribute to the Apache server's development.

In general, for any software that is open source, the program code can be obtained easily and freely. That way, we can download Apache modules on our device without having to worry about licensing fees. Even though using Apache doesn't cost anything, it doesn't mean that Apache can't compete with other types of web servers. Instead, Apache is a web server that is equipped with various features that are more reliable than other types.

Apache is a web server that can be used on various operating systems, such as Linux, Unix, Windows NT, MacOS, Microsoft Windows, Unix and other systems. That way, we can modify or add to the Apache server according to the capabilities of our operating system. Apache is also supported by several programming languages, such as PHP, Perl, Python and others. In addition, Apache is equipped with SSL (Secure Socket Layer) and TLS (Transport Layer Security) to enhance website security.

When a new bug is found, the developers who are members of the user community can fix it and share the solution for free on forums or social media websites. We can make Apache a virtual host on the server by using this Apache web server. That is, Apache can generate multiple hosts using the same IP address. To summarize, we can run multiple websites on a single server.

1.2.3. *Apache disadvantages*

As is well known, Apache is open source, which allows any user to modify or change the server. It turns out that if not handled properly, it poses a serious security risk. As a result, while Apache has many advantages, it also has some disadvantages, including the following:

With Apache's ability to let us select and disable the services we need, it can pose a serious threat if left untreated. If a process bug occurs, there is no specific policy to address it. We can only ask for solutions in the user community forums. If the problem we are having is the same as the problem other users are having, chances are we can find a solution to the problem.

That is an explanation of the meaning of Apache, its functions, and its benefits and drawbacks. As a result, we can clearly understand the meaning of Apache and select a web server based on its benefits.

1.3. *Superiority of Openlitespeed*

What are the Advantages of LiteSpeed Web Server ?. Clearly, the advantages of the LiteSpeed's web server can be listed as follows:

1.3.1. *The hardware requirements are not too high*

This is related to the use of better and lighter resources. Low hardware requirements mean that the cost of website needs can be reduced and focused on other things.

1.3.2. *Easy to learn*

This software uses the familiar Apache format but includes an easier-to-use control panel. Furthermore, the display is easy to recognize, making the process of remembering panel and button functions faster.

1.3.3. *Have a pretty good customer support (CS) and community*

If we have any issues with the software, please contact CS directly if we require any additional information or have any questions. The service provided is quick but friendly and on point.

If contacting CS is difficult, the LSWS community can be used to complain and ask questions. Web designer forums that use this software are typically very friendly and eager to assist.

1.3.4. *Easy transition from Apache format*

As previously stated, the LSWS seeks to facilitate this transition. Allows for the use of panels and improved software capabilities without the hassle of changing formats. The average person who is already familiar with running LSWS takes only 15 minutes to switch from Apache.

1.3.5. *Guaranteed security quality by applying mod security*

LSWS can already be equipped with security mods. The ease of adding mods to avoid DDoS and connection throttling is very important for the convenience of using the website.

Has a consistent processing speed and stability. LSWS's event-driven approach provides greater stability and speed than the previous format's process-based approach.

1.4. *Deficiency of Litespeed*

Is there a disadvantage to using LiteSpeed Web Server? Although the benefits of LSWS have been discussed previously, this software is not without flaws. LSWS has several disadvantages, including :

1.4.1. *The price is quite expensive*

Although it has many useful features and capabilities, the price of this software is quite high. Furthermore, LSWS sells licenses for this software, so users must pay on a regular basis.

1.4.2. *Some mods and apps are not all transitionable*

Not all Apache mods and applications can be transitioned. If the website employs a mod that is not listed in the LSWS, the previous website's functionality will be altered. LSWS, on the other hand, gradually adds mods and apps with each update to help with the transition.

LiteSpeed Web Server (LiteSpeed Web Server/ LSWS) is a well-known web server software. This software is ranked 4th as the most popular web server. LSWS is a product made by LiteSpeed Technologies in 2003.

Because LSWS was originally intended to be a drop-in replacement for the software, it was designed to have an Apache-like format. This makes LSWS very popular because websites that used the Apache format before the LSWS no longer had to reformat to produce the same appearance.

LSWS provides a control panel that is easier to use than Apache. In addition, this software replaces the function of the Apache program and provides an event driven approach to execute requests. Format calibration is easier to control and learn with this event-driven approach than it was previously.

OpenLiteSpeed is a user-friendly open source package that combines speed, security, scalability, optimization, and simplicity. It has Apache-compatible rewrite rules, a built-in web-based administration interface, and server-optimized PHP processing. OpenLiteSpeed's General Characteristics. It is built on an event-driven architecture. Fewer processes, lower overhead, and greater scalability. Recognize Apache's rewrite rules. OpenLiteSpeed supports mod rewrite with no new syntax to learn, allowing us to keep using our existing rewrite rules.

We will have a user-friendly administrative interface. The WebAdmin GUI is built into OLS, and the control panel bracket is available with the Cyber Panel. It was designed to provide both speed and security. It includes anti-DDoS connection and bandwidth limitations, ModSecurity v3 integration, and other features.

1.4.3. *Smart cache acceleration*

For a good user experience, the built-in full page cache module is highly customizable and efficient. Page speed improvement. With the mod pagespeed module, you can automatically implement Google's PageSpeed optimization system. PHP LiteSpeed SAPI, as stated on their website, allows external PHP applications to run up to 50% faster. WordPress speed up. OpenLiteSpeed and LSCache for WordPress provide improved performance.

Individuals who want to create their own website must have access to a web server. Starting with a business website, blog, hobby, or e-commerce, you can arrange and design it however you want. Websites have more control than blogs and will appear more professional and functional for specific purposes when used. LiteSpeed is one of the web server software packages that users praise for being simple to use and learn.

1.5. *Superiority of ClearOS*

ClearOS license is open source. All features such as antivirus, antispyware, content filter, VPN, etc. can be obtained for free, without the need to purchase from third parties at exorbitant prices.

1.5.1. *Professional support*

An active community and online documentation support are ready to assist us in finding solutions to our problems with ClearCenter.

1.5.2. *Convenient settings*

ClearOS provides simple setup with graphical guidance thanks to an integrated webconfig feature. Allows even inexperienced users to build dependable and powerful Linux servers.

1.5.3. *ClearOS community*

ClearOS Community is a free edition of the ClearOS Linux operating system. It can be downloaded for free and used without paying any fees. ClearOS Community Intended for Linux tinkerers and experimenters, and used for non-production servers such as test servers, personal servers, and so on. ClearOS Community receives regular updates for the operating system and applications via the Marketplace. To complement the ClearOS Community function, a number of paid applications are available in the marketplace.

1.5.4. *ClearOS professional*

The ClearOS Linux family's paid version is known as ClearOS Professional. ClearOS Professional comes in four flavors: Education, Basic, Standard, and Premium, with the distinction based on features and technical support. ClearOS Professional receives official technical support from ClearCenter and its global partners via online ticketing, chat consultation, phone, and on-site service. ClearOS Professional is designed for businesses, offices, government agencies, educational institutions, and organizations that require a dependable and secure server guarantee without the hassle of dealing with technical issues.

ClearOS Professional is licensed on an annual basis, ensuring that client systems are always kept up to date and maintained via the network's ClearCenter cloud system. The community and development team have tested ClearOS Professional's packages and modules for stability and security. ClearOS Professional modules and applications differ from ClearOS Community.

1.6. *Google Page Speed*

Google PageSpeed is a variety of tools designed by Google to help optimize website performance. There are 4 types of PageSpeed tools, namely: (1) Page speed modules; (2) Page speed insights; (3) Page speed services; and (4) Page speed chrome dev tools. Among the 4 tools, Page Speed Insights is the one that gets a lot of attention because of its benefits.

1.6.1. *PageSpeed insights defenition*

PageSpeed Insights is a tool that will report the performance of pages (websites) on mobile and desktop devices. PageSpeed Insights also provides recommendations and suggestions to improve the performance of our website. These 2 things make PageSpeed Insight popular among website owners and developers.

Speed Score is an indicator of website performance which is measured using PageSpeed Insights. PageSpeed Insights will give us a score from 0-100 which will be determined based on the performance generated by our website. The higher the score, the better the performance of our website. Optimization recommendations from PageSpeed Insights will depend on the score we get.

Website Page Speed optimization is important and can determine the performance of our website. Page Speed will automatically affect the number of visitors and our income.

1.6.2. *This is not a tool for testing speed*

If we think of PageSpeed Insight as a tool for testing website speed, we are wrong in that assumption. We can use Google Test My Site to determine the speed of a website.

What Google PageSpeed Insights does is report data about our website's performance. The data shown in the first part of the report is taken from the Chrome UX Report. Chrome UX Report is a massive anonymous data source (database). This data is collected from Chrome users around the world while they are searching and exploring. PageSpeed Insights will display real-traffic performance data (Real User Monitoring). Chrome UX Report itself has 3 parameters. The 3 parameters are: (1) Country; (2) Device type (desktop, mobile, etc.); and (3) Internet connection (speed).

1.6.3. Importance of google pagespeed insights for google page speed update

As we mentioned above, the speed of a website will greatly affect our website's ranking on Google search results pages. But this only applies to search results on the desktop.

As a result, Google implemented a new policy called Google Page Speed Update. Google has changed or updated the search engine ranking algorithm with the presence of this update by including mobile website speed as one of the indicators in the assessment. This update will have no effect on desktop websites.

2. Method

This research method employs an experimental method, which aims to test the effect of a variable on other variables or the causal relationship between one variable and another. The variables taken in this study are the Load Time variable and the Speed Index variable, because with these two variables the results can provide a conclusion, which web server is suitable for use in an agency.

This experimental research method has very clear differences compared to other research methods, namely the control of the research variables and the treatment given to the experimental group. The course of this research can be seen in the following diagram:

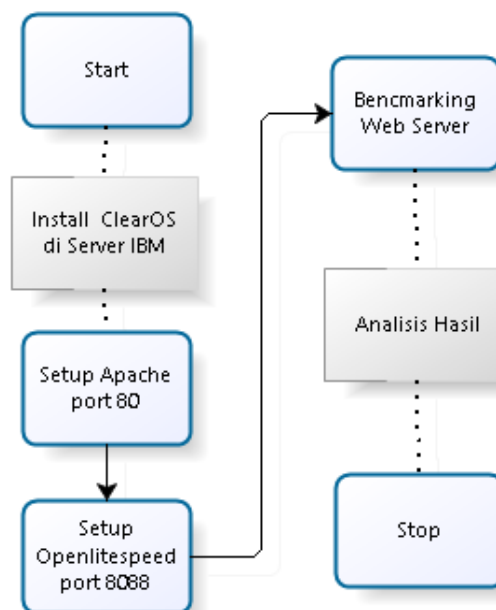


Figure 1. Research Diagram

2.1. Preparation Stage

ClearOS is used to run two webservers at once with different service ports, Apache uses port 80 and Openlitespeed uses port 8088, while the server used uses the following specifications. Turn on the computer and then insert the ClearOS 7 Linux installer DVD that we have prepared then enter the BIOS setup window

and change the boot order value to DVD as the first boot. Save and exit. After restarting the computer, we should see something like this on the screen.



Figure 2. ClearOS Installation

Hover over the Install ClearOS option once to highlight it, then press enter to launch the ClearOS 7 Linux installer program. Wait a few moments for the loading process to finish. Once the ClearOS 7 Linux installer program is ready, we will see a language and keyboard type selection window. Choose according to the language and type of keyboard we are using and then click Continue in the lower right corner of the screen. Then we will see a ClearOS 7 Linux installation summary window that we need to configure. We can start by setting the date and time. Click the DATE & TIME option. Adjust to the time where we are. Then click INSTALLATION SOURCE to select the installer source. Via USB, DVD or others. Here I select the auto-detect option then click Done to save the configuration and return to the summary window. Then click INSTALLATION DESTINATION. Select the hard disk that we have prepared for this in the Local standard disk column, and select automatic in the Partitioning column then click Done. Next NETWORK & HOST NAME. Make settings here as necessary, and usually, only activate the network card via the ON/OFF switch. We are ready. Click Begin installation to continue with the ClearOS 7 Linux installation process. In the installation process window, we can add a password to use to log into the root account. Click ROOT PASSWORD to do so. After the installation process is complete, click the Reboot button to restart the computer. Take out the installation media we are using and welcome to the ClearOS 7 Linux system.

2.2. Apache Webserver Installation and Openlitespeed

Apache HTTP server is the most used web server in the world. Apache provides many powerful features including dynamically loadable modules, strong media support, and extensive integration with other popular software. Before we start, we should have a regular, non-root user with sudo authority configured on our server.

2.2.1. Install apache

Apache is available in the default CentOS repositories, making it possible to install it using conventional package management tools. On CentOS and RHEL the Apache packages and services are called httpd. To install the package, run the following command:

```
Httpd program
sudo yum install httpd
```

After that, we activate and start the services:

```
Httpd program
sudo systemctl enable httpd
sudo systemctl start httpd
```

If our server is protected by a firewall, we will need to open HTTP and HTTPS ports, 80 and 443. Use the following command to open the required ports:

Httpd program

```
sudo firewall-cmd --permanent --zone=public --add-service=http  
sudo firewall-cmd --permanent --zone=public --add-service=https  
sudo firewall-cmd --reload
```

Apache installation verification. Now that we have Apache installed and running on our CentOS 7 server, we can check the status and version of the Apache service, using the command:

Httpd program

```
sudo systemctl status httpd
```

Then see also the installed version by using the command:

Httpd program

```
sudo httpd -v
```

2.2.2. Apache process management

Now that our web server is up and running, let's go over some basic management commands. To start the web server, type:

Httpd program

```
sudo systemctl start httpd
```

Apache Basic Setup on CentOS. Here's the basic Apache setup on CentOS, if we have trouble, or want to change the configuration, this is the place to look for: (1) All Apache configuration files are in the /etc/httpd directory; (2) Apache's main configuration file is /etc/httpd/conf/httpd.conf; (3) The configuration files responsible for loading various Apache modules are located in the /etc/httpd/conf.modules.d directory; (4) For better maintenance it is recommended to create a separate configuration file (vhost) for each domain; (5) Apache virtual hosts must end in .conf and be located in the /etc/httpd/conf.d . directory; (6) It is highly recommended to follow standard naming conventions, for example if the domain name of this site is beritabebas.com, then the domain configuration file is named /etc/httpd/conf.d/beritabebas.com.conf for easy site management; (7) Apache log files (access.log and error.log) are located in the /var/log/httpd directory. It is recommended to use different access and error log files for each virtual host; (8) We can set our domain's document root directory to any location we want. The most common locations for webroots include: (a) /home/<user_name>/<site_name>; (b) /var/www/<site_name>; (c) /var/www/html/<site_name>; (d) /opt/<site_name>.

The first step, access the OpenLiteSpeed panel using our server IP or domain. Then, add port 7080 to the IP URL of our server or domain. Here's an example: https://our_Server IP:7080. Then, we will be directed to the login page of the OpenLiteSpeed panel. Exactly like in the figure below.

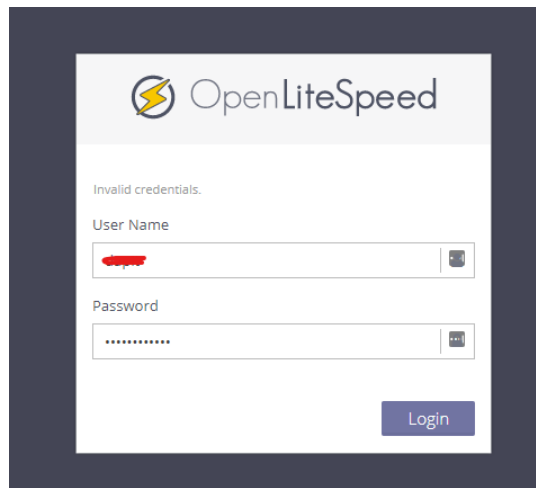


Figure 3. Login Form OpenLiteSpeed

Step 2, select listeners menu. After successfully logging into the OpenLiteSpeed panel, we will be directed to the home dashboard of the OpenLiteSpeed panel. Then, to change the panel port, go to the listeners menu.

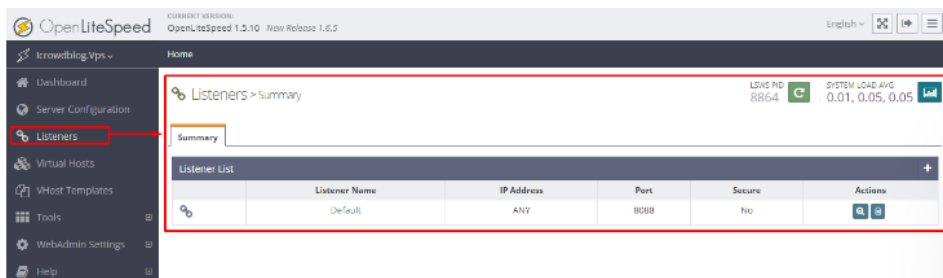


Figure 4. Dashboard OpenLitespeed

Next, click the view icon in the Actions feature.

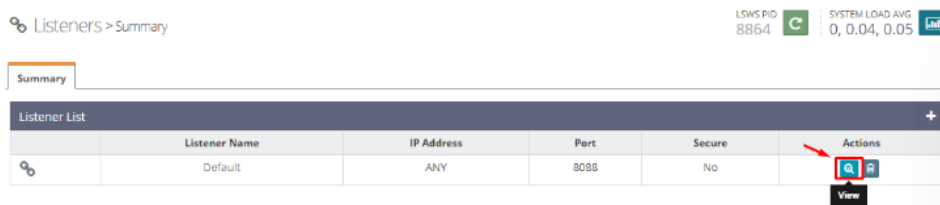


Figure 5. List of Listerens

After that, we will be directed to the General Address Settings page. Then, click the Edit icon on the General menu. Like the example in the figure below.



Figure 6. Default of Listerens

Step 3, edit address settings. Next, change the number on the Port form according to the port we want. Make sure the port used has two numbers and a maximum of four numbers. In this guide, we use four numbers, namely 1598. If we have entered a number, click the Save icon in the right corner. As in the figure below.

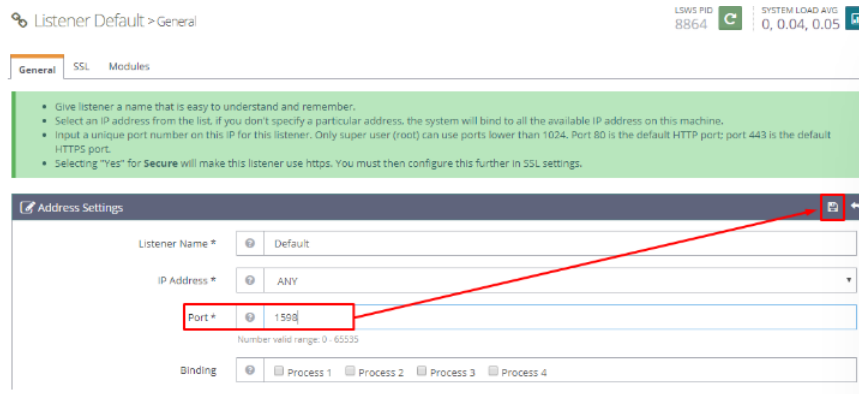


Figure 7. Listerens Setting

When finished making changes to Address Settings, restart the server using the OpenLiteSpeed panel. The trick is to click the restart icon on the panel.

Step 4, check results. The last step is to check the results of the changes using the server IP URL and the domain. The trick is simply to add the port in the URL. This guide uses port 1598. The following is an example and the result of changing the port on OpenLiteSpeed. https://our_server_ip:1598.



Figure 8. Result Page

3. Results and Discussion

The size of the test can be seen from the comparison of three applications that are tested simultaneously, t The test application compares three applications: webpagetest, gtmatrix, and Google Insight. Based on the three test applications, it is possible to determine which webserver to use.

This test yielded two variables: Load Time and Speed Index. Load Time is the time it takes to open or display a website as a whole, whereas Speed Index is how quickly the page content is clearly visible. The lower the monetary value, the better.

3.1. Apache Web Server Testing

3.1.1. Test results using pagespeed insight

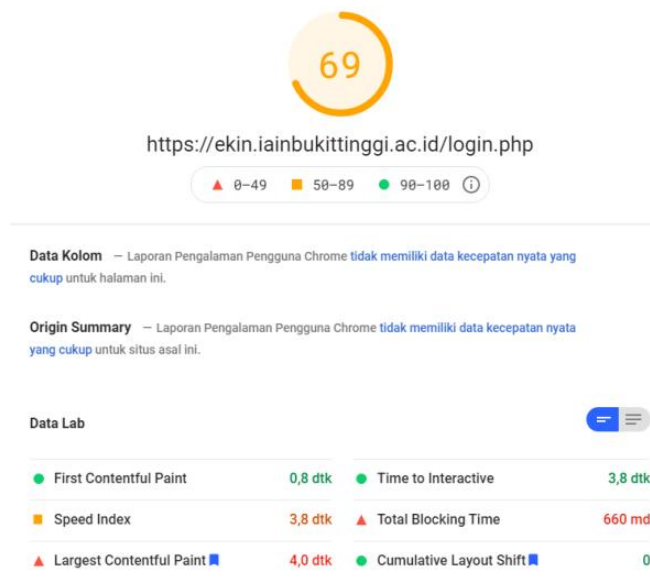


Figure 9. Testing on PageSpeed Insight

The results of the above test, apache produces a score of 69 points, where the load time of this application is 3.8 seconds, on a website, but the speed index is less than the usual website, which is 3.8 seconds.

3.1.2. Test results using gtmatrix

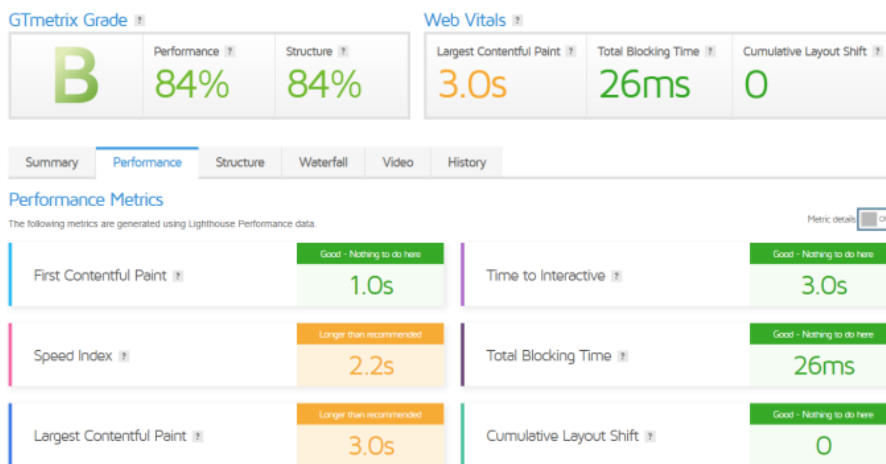


Figure 10. Testing on GTmetrix

The test employs GTmetrix, and this website can be accessed from abroad with an 84% score. The speed index time in this test is 2.2 seconds, which is quite fast compared to the PageSpeedInsight test, and the time to interact is only 3 seconds, which is quite fast for a website in general.

3.1.3. Test results using webpagetest



Figure 11. Testing on Webpagetest

In the test results of Figure 4 it can be seen that the load time on the application page takes a total of 5.5 seconds, while the bandwidth used is +4000kbps.

3.2. Openlitespeed Web Server Testing

3.2.1. Test results using pagespeed insight

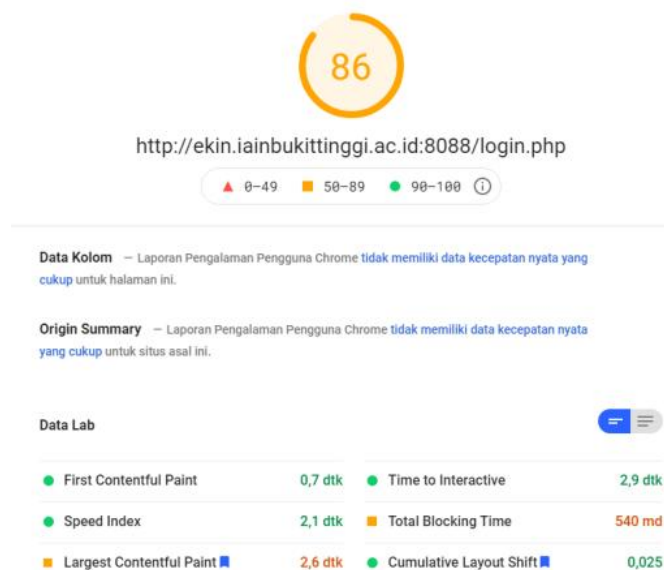


Figure 12. Testing on PageSpeed Insight

The results of the above test, apache produces a score of 86 points and this is superior to its competitor Apache, the load time of this application is 2.9 seconds, on a website in terms of speed, the speed index is 2.1 seconds.

3.2.2. Test results using gtmatrix

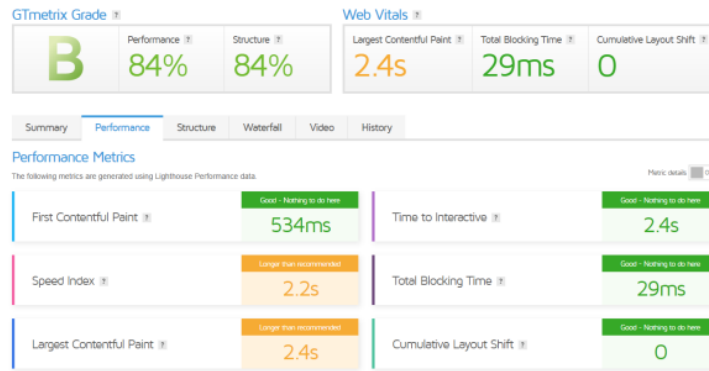


Figure 13. Testing on GTmetrix

The test uses GTmetrix, where this website can be accessed abroad with a score of 84% the same as Apache, where in this test the speed index time is 2.2 seconds, for the time to interact it is only 2.4 seconds.

3.2.3. Test results using webpagetest

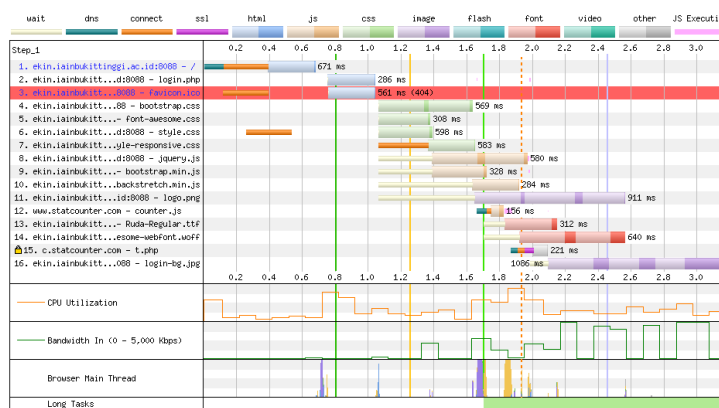


Figure 14. Testing on Webpagetest

In the test results of Figure 7 it can be seen that the load time on the application page takes a total of 3.5 seconds, while the bandwidth used +4000kbps is almost the same as Apache but the bandwidth usage is shorter than Apache because the loading time is only 3.5 seconds.

3.3. Results

In the test results of the two web servers above can be described as follows:

Table 1. Preliminary Data

Web Server	Testing Tools	Load Time	Speed Index
Apache	Page speed Insight	3.8	3.8
	GTmetrix	3.0	2.2
	Webpagetest	5.5	-
Openlitespeed	Page speed Insight	2.9	2.1
	GTmetrix	2.4	2.2
	Webpagetest	3.5	-

From Table 1, it can be seen that Openlitespeed has a much faster request completion time compared to Apache, so the conclusion is that Openlitespeed's performance is better than Apache in terms of serving client requests.

4. Conclusion

The speed of service of a large and complex website at an agency that serves client requests will certainly affect the agency itself, for example a university that serves 12,000 students, whose services prioritize the information system website on a web server, if load time and Speed Index on the web server is slow, so users (students/lecturers) will experience problems in carrying out the learning process and information system-based services during this pandemic. According to the results of the tests performed on the two web servers mentioned above, Openlitespeed has a better Load time and Speed Index in completing client requests. After the testing process of the number of requests began to open both web servers with examples of performance electronic applications at IAIN Bukittinggi, the results were obtained. From these tests, server performance using Openlitespeed is significantly better in running, as shown in Figures 4 and 7 at the CPU Utilization point, implying that data processing on a website application running on the Openlitespeed webserver is the best choice to apply to the current webserver.

As software that has an Apache-based format, there are still many people who are not sure to switch to using the LiteSpeed web server. The most common reason is that Apache is already running well with some mods; is it necessary to move? Many people still question whether the money spent on upgrading and switching software is worthwhile. For those who are still in doubt, switching to using LSWS not only reduces the load on the website but also speeds up the process. The usual Apache format has problems running processes. Apache requires threads to be generated and run continuously every time it runs, for LSWS this is not necessary. Because of LSWS's event-driven approach, each Apache connection runs in its own thread and process. This reduces the amount of resources required. The lighter the load, the more visitors the website can support and the faster the data load time.

Mark Jaquith, a WordPress consultant, has a good analogy for a layman's picture. He compared Apache's process-based approach to LSWS's event-driven approach to two clothing stores with different sales systems.

Apache is described by Store A, which provides excellent service. One salesperson serves everyone who comes to buy clothes. This salesperson will accompany the visitor on every step he takes until he completes his clothing purchase. This store requires one visitor and one salesperson. This is certainly good service, but because store A has a limited number of sales employees, there will be lines if there are many visitors.

Store B is a representation of LSWS; the service is not as good as in Store A, but visitors are given more freedom. Sales are only placed in strategic locations to meet specific needs, such as information sources and changing room requirements. After we have finished looking at and trying on clothes, visitors can proceed to the cashier to pay on their own.

Assuming that sales is a resource used by software, LSWS will provide the ability to accommodate a large number of clients while also speeding up the process. While Apache allows clients to fully utilize all features, it comes at the expense of many clients being served in a short period of time, and the process is also slower.

Website users prioritize speed and responsiveness when browsing. Visitors will go to another website if the website does not respond and process quickly.

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