

WEBSITE & CLOUD PERFORMANCE ANALYSIS

Evaluating Cloud Performance for Web Site Hosting Requirements





WHY LOOK AT PERFORMANCE?

There are many options for Web site hosting services, with most vendors seemingly offering the same features at the same low price. Choosing the right hosting solution and provider can be more difficult than originally imagined. Despite all of the similarities between Web hosting solutions and providers, one difference stands out: Cloud performance. **Faster Cloud virtual machine (VM) performance will lead to a better Website experience for users.**

Website performance is often taken for granted when selecting the right Cloud hosting provider. Performance of the same VM sizes are not equivalent when compared across service offerings, much like the gas mileage and reliability of the same category of automobiles.

Website performance is largely impacted by the hardware components that make up the system that the website is running on.

Therefore, in order to test VM performance for Web site hosting, Cloud Spectator examines each piece of the underlying technology that provides the foundation for customer websites. Liquid Web's Cloud Hosting solution, built for performance and reliability, and which caters to small and medium businesses, beats the competition based on the performance studies conducted by Cloud Spectator. The results show that Liquid Web offers a competitive solution for Website hosting needs on platforms such as WordPress, Joomla, or other commonly used CMS and eCommerce software.

PIECES OF A WEBSITE: THE LAMP STACK



In order to measure performance of websites for this study, **Cloud Spectator examined both the performance of Cloud Infrastructure as a Service (IaaS), along with each piece of the LAMP stack.** LAMP stands for Linux, Apache, MySQL, and PHP. These LAMP components work together to serve a Website's content to its visitors.

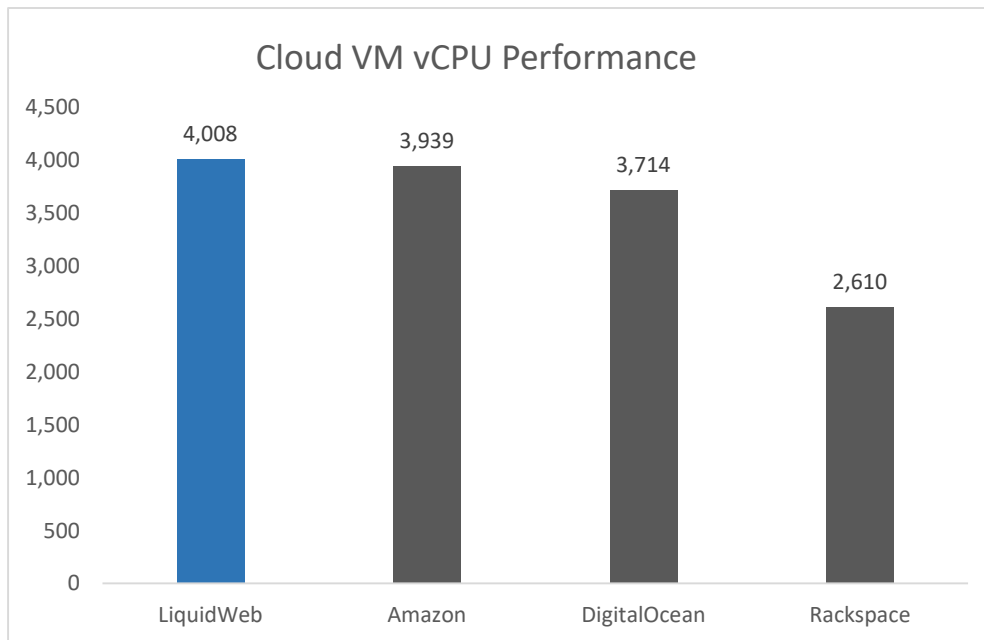
How Was the Data Collected?

Cloud Spectator collected data on entry-level VMs across Liquid Web (VPS), Amazon, Rackspace, and DigitalOcean for a total period of 48 hours. In that 48-hour period, Cloud Spectator ran multiple iterations of performance tests. The median results are used in this report. The Linux operating system used for the testing was Ubuntu 16.04 LTS.

THE LINUX VM: vCPU & RAM

PERFORMANCE OF THE LAMP STACK

The virtual processor (vCPU) of a Cloud VM is the “brain” of a VM or VPS. The vCPU performs tasks such as compressing images or encrypting data, to ultimately deliver the desired Website experience to the user. The faster a processor can complete its tasks, the better performance they will experience. Cloud Spectator ran a series of processor-intensive tasks across Amazon, Digital Ocean, Liquid Web, and Rackspace VMs. **The results show Liquid Web leading in the rankings for single core vCPU performance, as illustrated below.**



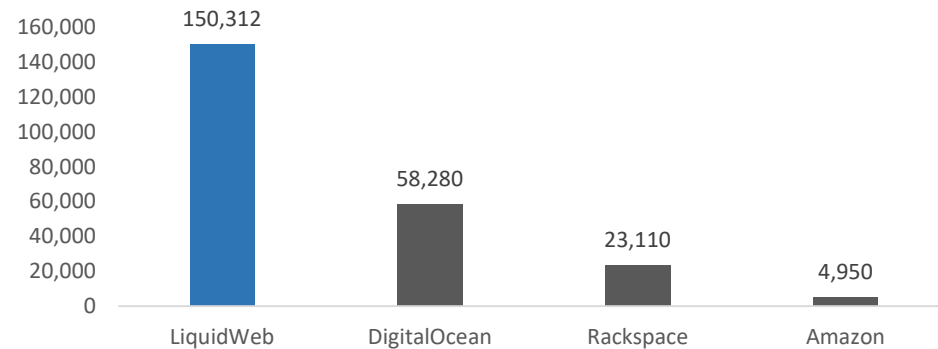
THE LINUX VM: DISK IOPS

PERFORMANCE OF THE LAMP STACK

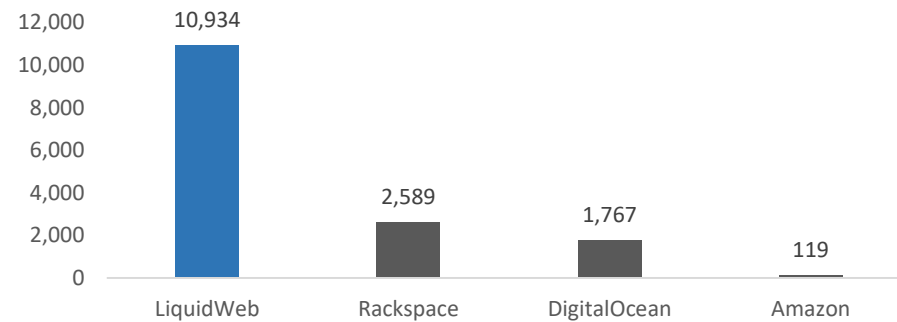
For blogs, ecommerce sites, and mobile apps, a lot of files are stored on disk; such as Images, Videos, HTML, CSS and everything else that makes your site look amazing. Even if a CDN is utilized, files still need to be updated and refreshed from time to time. **This means that faster read performance has a direct impact on the responsiveness of your website or mobile app.**

Random write performance can have a significant impact on the performance of any I/O (input-output) intensive application such as Magento, WooCommerce or other e-commerce content management systems (CMS). While it is important to have fast read performance, what matters most during peak traffic periods is how many orders and sales your CMS application can handle. **Liquid Web provides the highest disk performance no matter what the application requirements are.**

Random Read IOPS



Random Write IOPS



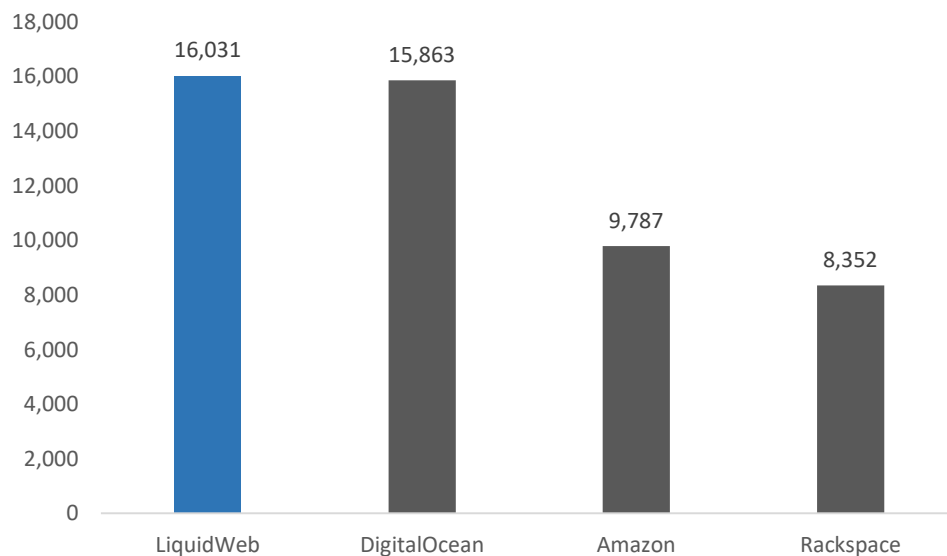
APACHE

PERFORMANCE OF THE LAMP STACK

Apache Webserver is a very common Webserver that handles client request traffic into to your Website or application, similar to Nginx or LiteSpeed. **The more inbound requests Apache can serve per second, the more responsive and reliable your Website is.** The number of Web site requests is highly dependent on the virtual processor performance examined in the previous section.

In order to isolate VM performance, Apache performance data was collected by running Apache and Apache Benchmark on the same VM (localhost). The data below shows which providers offer the best raw Web server performance. **Liquid Web performs very well in these rankings.**

Apache WebServer - Requests Per Second



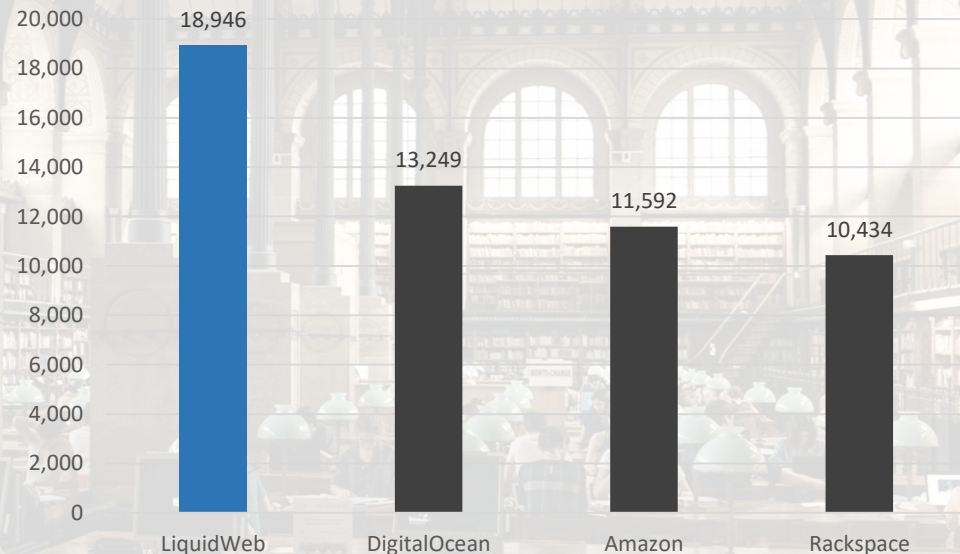
Liquid Web's VPS handled queries **almost 1.5x faster than DigitalOcean**, and **2x faster than AWS and Rackspace VMs**.

THE MYSQL DATABASE PERFORMANCE OF THE LAMP STACK

MySQL is a database that stores all of the important information that a Website needs to be able to deliver a fully dynamic and rich Web experience to your end users. For example, if a user is required to log in to access certain parts of your website, the user identity and credentials would probably be stored in a MySQL database. Additionally, a customer who purchases something from your online shop will query (read) and update (write) the database that powers your online store.

Cloud Spectator created a MySQL database to test the performance each server type. The database contained roughly 5 million rows and was tested with 24 concurrent threads to ensure requests were coming in and going out continuously to stress test the system. The tests involved both reads and writes to the database. **The results are illustrated in the table below, highlighting Liquid Web's superior performance.**

MySQL Mixed Workload - Queries Per Second



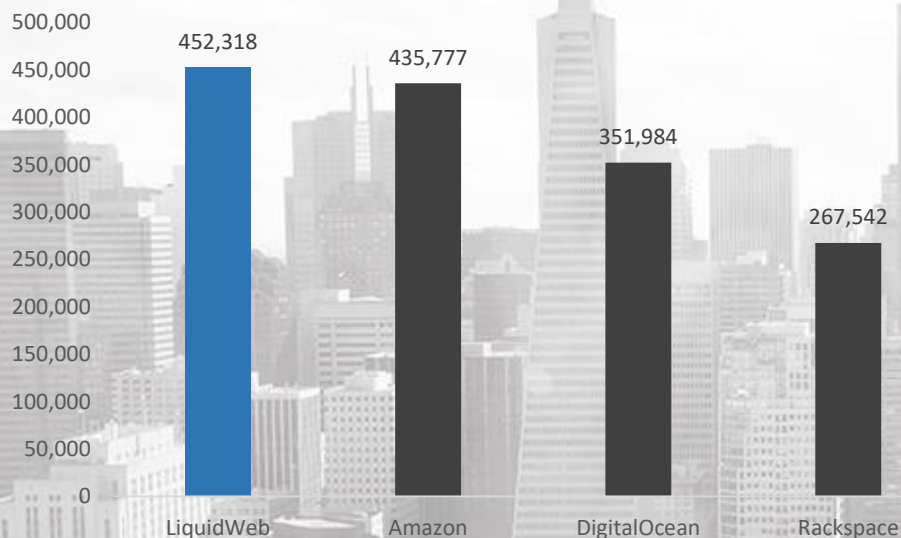
PHP

PERFORMANCE OF THE LAMP STACK

PHP is a programming language that is used commonly by many popular content management systems such as WordPress, WooCommerce, Magento and Joomla. One of PHP's most common use cases is to generate the dynamic content on a Website and query MySQL for specific data. For example, if a user is required to register on your Website, PHP will generate the sign-up page, pass that information to MySQL, which will store that information in the database for long term retention and future transactions.

It is critical that Apache and PHP perform as quickly as possible, otherwise users may move on to another Web site. Transaction speed and response time is critical for online sales. PHP performance is measured by testing various aspects of the PHP interpreter, which is used by the VM to execute PHP code. **The performance of the PHP interpreter is directly affected by the virtual processor. Therefore, better processor performance may correlate with high PHP performance**, although various other aspects of the VM and operating system (OS) may also impact performance.

PHP Performance - PHPBench Score



Liquid Web's fast VPS processing speeds translates into better PHP performance than its Cloud competitors.

ABOUT THE STUDY

VMS EXAMINED IN THIS DOCUMENT

Amazon AWS	C5.Large with SSD EBS
Digital Ocean	4GB Compute Optimized
Liquid Web	2GB SSD Cloud VM (40GB SSD)
Rackspace Cloud	Compute Optimized 4GB

DATA CENTER LOCATIONS

Amazon AWS	US East
Digital Ocean	NYC
Liquid Web	Zone C
Rackspace Cloud	Dallas Fort-Worth

GENERAL INFORMATION

Operating System	Ubuntu 16.04 LTS
Test Duration	48 Hours per VM

CONCLUSION

Website performance on your Web site hosting provider and their underlying Cloud services. While Web site design and optimization are key to online performance, a powerful, performance-engineered Web site hosting environment will help retain eyeballs and convert Web site visits into sales. Liquid Web's VMs, which were tested against Amazon, Rackspace, and DigitalOcean, demonstrated the highest server-side performance the components of the LAMP stack, which is the integral foundation for most Websites on the Internet today.

- Liquid Web's 2GB Cloud VM **outperformed the larger, compute optimized VMs from Amazon, Digital Ocean and Rackspace.**
- Liquid Web's VMs **demonstrated faster processor performance and higher disk IOPS** than competitors Amazon, Digital Ocean, and Rackspace.
- Liquid Web's VMs sustained the **highest number of requests per second** for an Apache Web server.

FURTHER STUDY

This study examined server-side performance of Web servers, and it is important that all hardware and virtualized components of a provider offers fast performance to deliver Website content. A potential next step in examining performance would be measuring performance of the network. In other words, testing how reliable and fast the network connection is from the Web server to the users. From a network perspective, response time and page load time are also important measurements to evaluate how fast Web site content can be delivered to a visitor's screen.