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# The Fastest, Most Scalable Magento 2 Websites

LiteMage Cache, Redis Cache and a CDN

An Aspiration Hosting Whitepaper

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# Table Of Contents

<b>Introduction</b>	<b>03</b>
<b>1.0 What are Litemage Cache, Redis and CDN?</b>	<b>03</b>
<b>2.0 What are Litemage Cache, Redis and CDN?</b>	<b>04</b>
<b>3.0 Testing</b>	<b>05</b>
<b>3.1 Test One: Non-Cached</b>	<b>06</b>
<b>3.2 Test Two: With Caching Enabled</b>	<b>07</b>
<b>3.3 Test Three: Fully Optimized</b>	<b>07</b>
<b>Conclusion</b>	<b>08</b>

## Introduction

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Magento 2 is a powerful, extensible ecommerce applications available. However, the architecture makes having a fast Magento website challenging. In this paper, we explain why speed is so important. Second, we describe several technologies needed to minimize page load times. Specifically, we recommend LiteSpeed web servers with LiteMage Cache, Redis Caching and a Content Delivery Network (CDN). Finally, we document the testing we did to arrive at our recommendations.

## 1.0 Why A Speedy Magento Website Is Critical

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Let's face it, visitors want to interact with fast loading websites. It is not just website visitors, even search engines want sites that load within milliseconds. A fast loading Magento website is mandatory today. If your e-commerce website is slow, your competitor's website will be attractive. A critical element for the success of an online store is how fast the pages load. In other words, customer conversion rates are impacted by website speed.

90% of shoppers will abandon a site if it doesn't load in a reasonable time, according to a survey of 1,100 U.S.-based consumers conducted by Retail System Research (RSR) from April-May in a report released by ecommerce cloud platform Yottaa Inc. While that's common sense, the majority of ecommerce websites fail Google's Core Web Vitals speed tests.

In addition to the user experience, search engine traffic is effected by site speed. As of June 2021, Google is including site speed as a ranking factor. Slow sites see reduced traffic and fast sites are rewarded with more traffic. So the time is now to evaluate your Magento website speed and improve performance.

Your website's hosting environment is an important part of that equation. Choose a solid architecture for your Magento website for maximum speed.

## 2.0 What Is Litemage Cache, Redis And CDN?

Our testing in Section 3.0 shows that a combination of LiteMage Cache, Redis Cache and a CDN exponentially increase Magento speed and the number of concurrent visitors (“scalability”). What are these technologies?

LiteMage Cache is the leading full-page caching solution for Magento 2. LiteMage is built on top of [LiteSpeed Cache](#) (LSCache), and is tailored specifically for Magento; and thus, able to assemble both public and private blocks using Edge Side Includes (ESI) in [punching holes](#), for the best and fast performance.

The core function of the LSCache in a LiteMage Cache is to accelerate dynamic content (apart from PHP pages), aided by a customizable and efficient [LiteSpeed server](#), resulting to reduced page load time and server load. In addition, LSCache removes the extra reverse proxy layer (s) needed by add-on cache packages (like Varnish), giving you a fast and efficient handling of static content, plus exceptional handling of dynamic content. That is what makes LiteMage Cache a world-leading fastest caching tech for Magento 2.

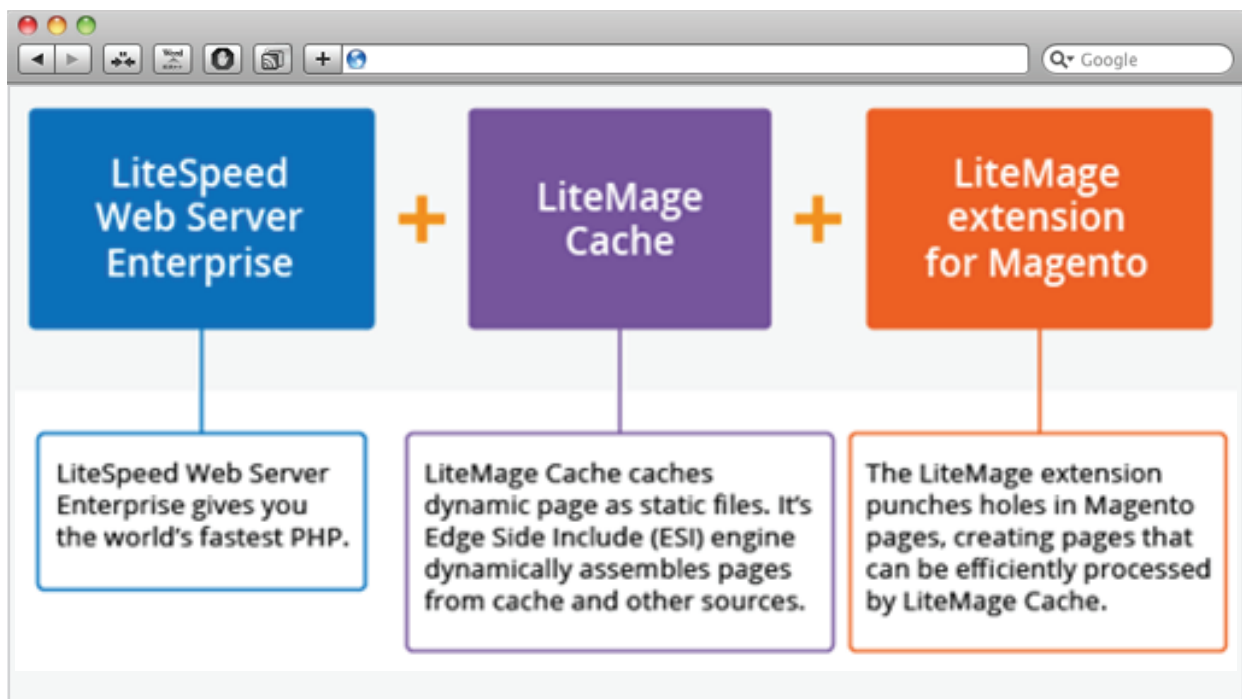


Figure 1: LiteMage Cache shortens server stack and eliminates overhead; credit: [LITESPEED](#)

**Redis** is an optional, backend cache solution, used as a Least Recently Used (LRU) cache, evicting old data automatically as you bring in new data. LRU, as a supported eviction method, serves to limit the memory usage to a specified or fixed amount for the data set. When the aforesaid fixed memory is reached, Redis automatically evicts the old data, returning back to the specified memory limit each time new data is added. Redis offers a fast speed on Magento, making it a must-have, exceptional cache layer.

Lastly, a Content Delivery Network (CDN), in layman's terms, is basically a network of servers and data centers that deliver website content as close to the ultimate consumer as possible. For files and websites, a CDN assures that local users don't have to fetch all of their content from the source, which may be on the other side of the country or world.

## 3.0 Testing Phase

For testing, we choose a common server configuration, LiteSpeed web server, MySQL and Magento 2.3.6. Details are below. Then we tested using no caching enabled to establish a baseline. Then we tried various software configurations. To simplify the results, we are providing the results for,

- ✔ Magento without caching enabled
- ✔ Magento with the built in cache enabled
- ✔ Magento with LiteMage Cache, Redis Cache and a CDN

As you'll see, the fully optimized option is not only faster, but easily handles exponentially more visitors.

In order to measure performance on Magento we used the load testing tool provided by **K6**. We setup a server with Magento 2 using these specs:

### Server

- ✔ Memory Size: 9GB
- ✔ CPU: Intel Xeon Processor
- ✔ CPU number: 4
- ✔ CENTOS 7.9 kvm
- ✔ LiteSpeed Web Server v5.4.8

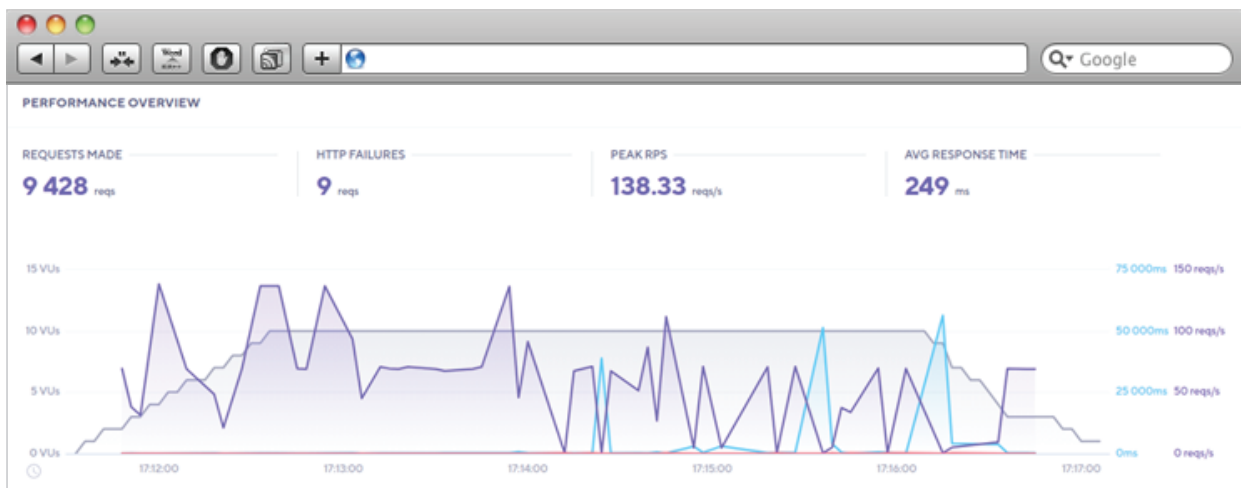
### Magento

- ✔ Magento Open Source ver. 2.3.6
- ✔ Sample Data
- ✔ PHP ver. 7.3.26

We performed three tests in order to show the impact of caching on Magento 2 as well as the significant improvements achieved by adding further enhancements to your website. Using K6, we recorded a simple user scenario simulation of visiting a category page, product page, and adding to the cart. We then ran the scenario using 10 concurrent Virtual users over a period of 5 minutes.

## 3.1 Test One: Non-cached

For this first test, we ran the simulation on a non-cached site.



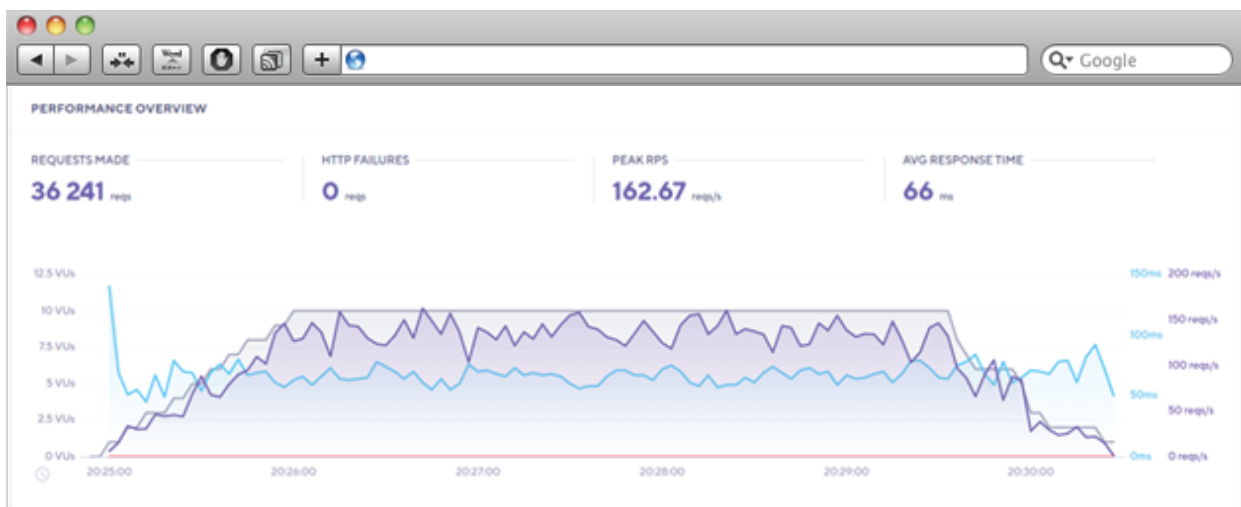
The average response time of the system being tested was 249ms, and 9 428 requests were made with 9 failures, at an average request rate of 28 requests/second.

The AVG Response Time here is also a bit misleading since it does not include the failed requests which timed out trying to load the pages. When browsing this site as a regular user, page loads are roughly 11 seconds long when no caching method is applied.

What this test does show is a site with very poor performance as expected. With only 28 requests per second on average, it would be a frustrating store to shop for your end users.

## 3.2 Test Two: With Caching Enabled

For this second test we enabled the built-in cache feature in Magento and ran the same simulation in K6.



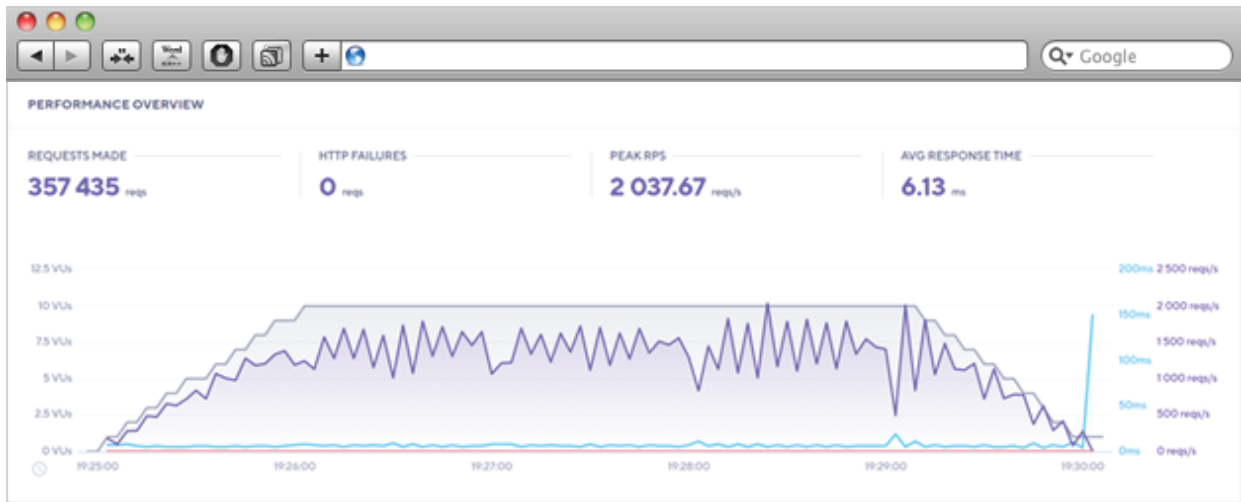
The average response time of the system being tested was 66ms, and 36,241 requests were made at an average request rate of 110 requests/second.

This is a noticeable improvement from the first test. As we can see here the average request rate has more than tripled. Caching has made it possible to fulfill more requests per second and the response time for pages has greatly improved to an average of 66 ms.

This performance might be suitable if you only have a small amount of traffic on your website.

## 3.3 Test Three: Fully Optimized

On this test, we enabled advanced optimization features including LiteMage Cache, REDIS, and a Content Delivery Network (CDN). We then ran the same simulation again in K6.



The average response time of the system being tested was 6.13ms, and 357,435 requests were made at an average request rate of 1,172 requests/second.

As we can see from this test, there has been an exceptional improvement to the site speed and number of users. The average request rate has improved to over 10 times faster than the previous test and the average response time per request nearly 6 ms. With these enhancements on your website, you will be able to serve pages quicker as well as handle an increased amount of contiguous user traffic.

Enabling cache on your Magento site will improve your speed and throughput but it is nowhere near the impact of having the further enhancements of LiteMage cache, CDN, and Redis enabled.

## Conclusion

It is crystal clear that the higher the speed of your webstore, the higher the conversation rate and search engine ranking. There is no better, proven way for optimizing your store's performance than having the enhancements of LiteMage Cache, CDN and Redis enabled.

At [Aspiration Hosting](#), we love when our clients sell more. Delighting your customers with a fast shopping experience delivers more sales. Get in touch with us, and our team of professionals will take you through how a modern webstore should look and how fast it can be.