



# MAGENTO 2 PERFORMANCE OPTIMIZATION PLAYBOOK

MASTER THE ART OF LOADING YOUR  
STORE IN UNDER 3 SECONDS

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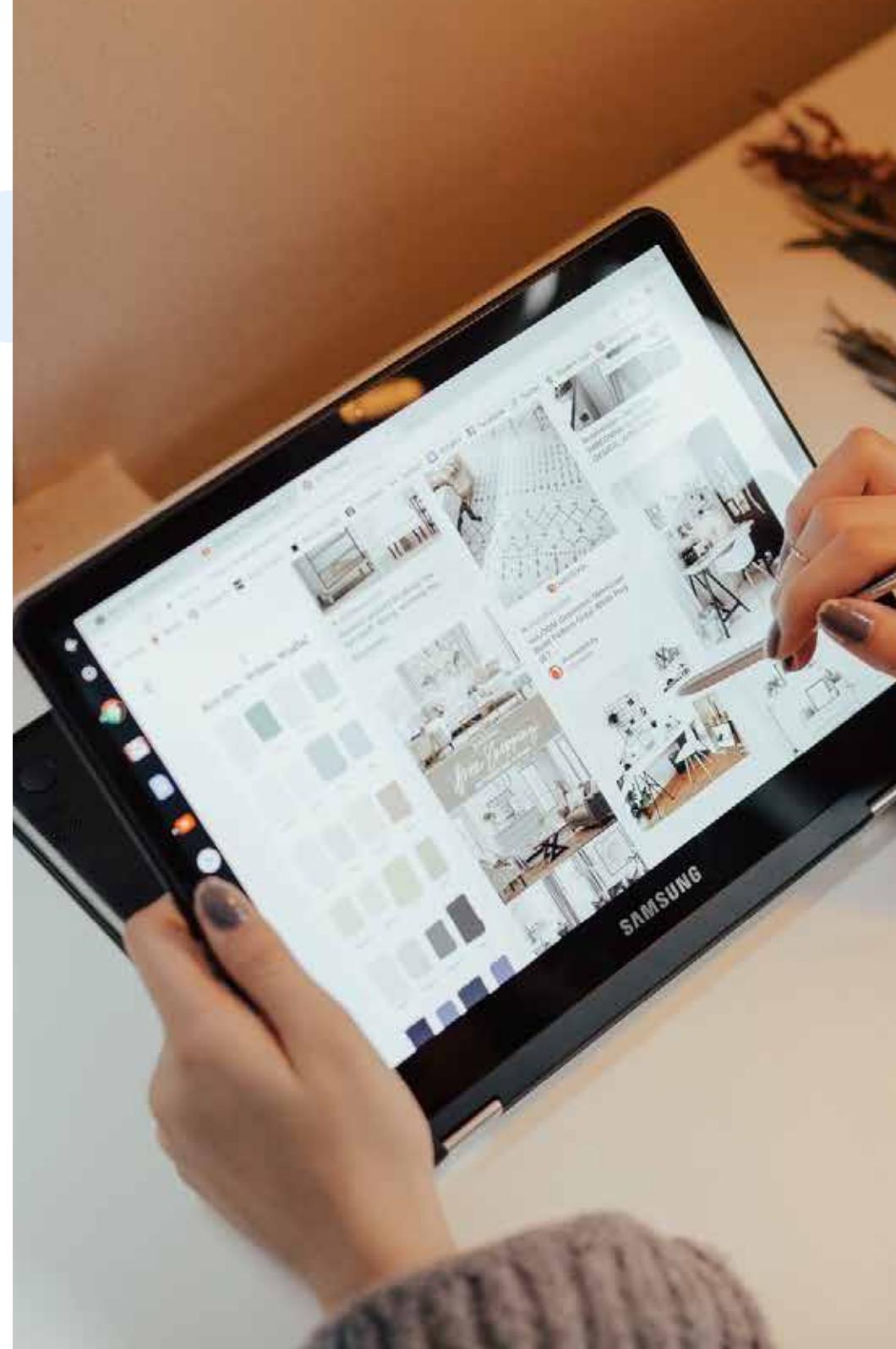
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# INTRODUCTION

# 1

Magento is a powerhouse offering scalability, customizability, and integration capabilities that any eCommerce business would love to leverage. These capabilities come packed with equally strong challenges in terms of performance. So, make performance optimization a key phase of your Magento 2 store development.

Here are some of the statistics which emphasize the importance of performance optimization:



# DID YOU KNOW?

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**47%**

of consumers expect a web page to load in 2 seconds or less.

**40%**

of people abandon a website that takes more than 3 seconds to load

**7%**

A 1-second delay in page response can result in a 7% reduction in conversions

**16%**

A 1-second delay reduces customer satisfaction by 16%

**\$2.5**

If an eCommerce site is making \$100,000 per day, a 1-second page delay could potentially cost you \$2.5 million in lost sales, annually

**4.42%**

Website conversion rates drop by an average of 4.42% with each additional second of load time (between seconds 0-5)

**70%**

Nearly 70% of consumers admit that page speed impacts their willingness to buy from an online retailer



# LOAD 'ABOVE-THE-FOLD' CONTENTS FIRST

# 2

Above-The-Fold' is the content users get to see first. It's the first part of the page, after which a user scrolls to see the remaining content(s). This can be done via the technique provided below:

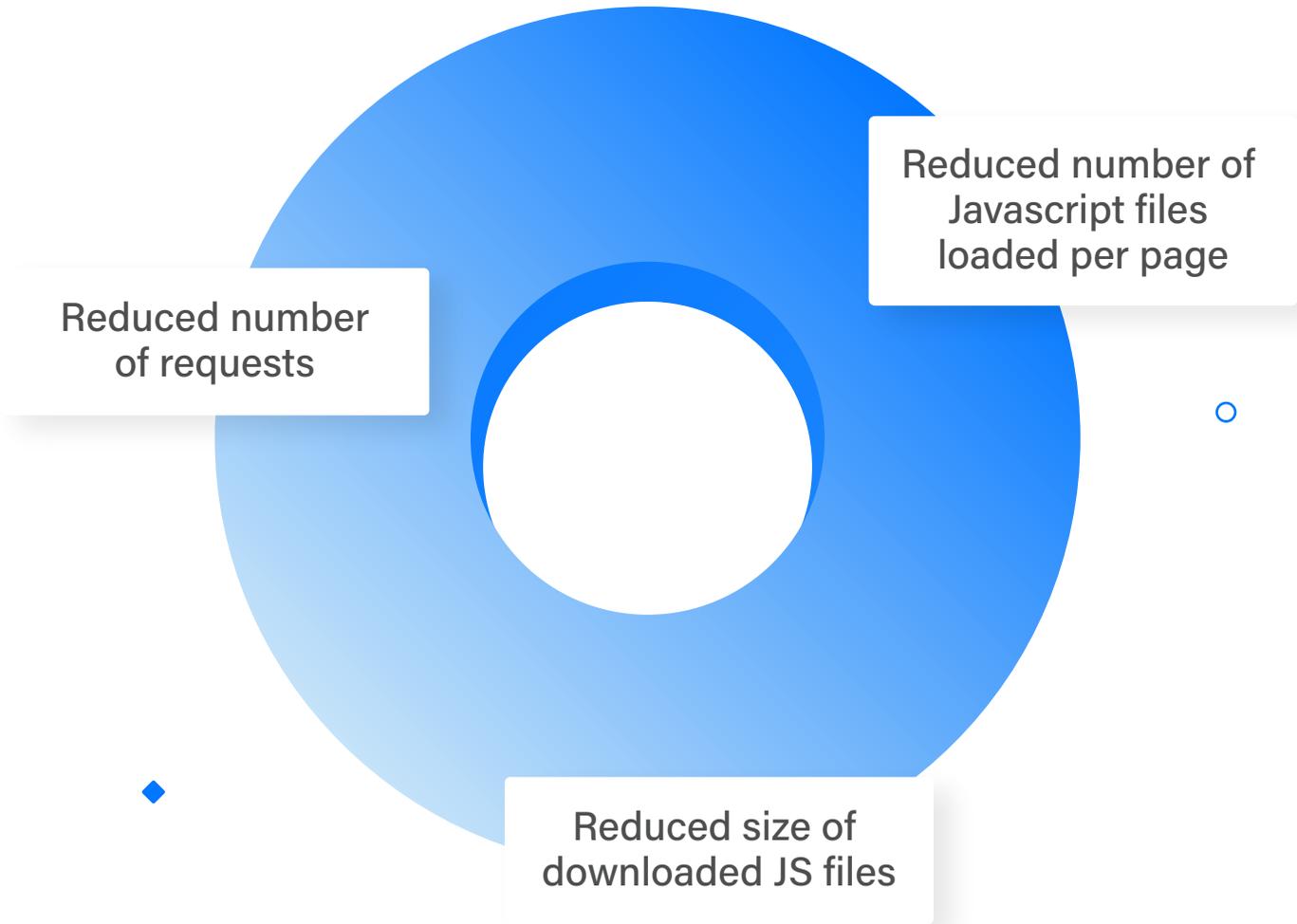
## REFRAIN JS FROM LOADING UPFRONT

Content in a web page must be given priority over the JS code. When a web page's above-the-fold content loads, the JS code also loads simultaneously, increasing load time.

Refraining JS from loading upfront means deferring the parsing of JavaScript code. This can be done by moving JavaScript code to the bottom of the page and can be achieved with the help of third-party extensions.



# ADVANTAGES OF JS BUNDLING



# ADVANCED JS BUNDLING

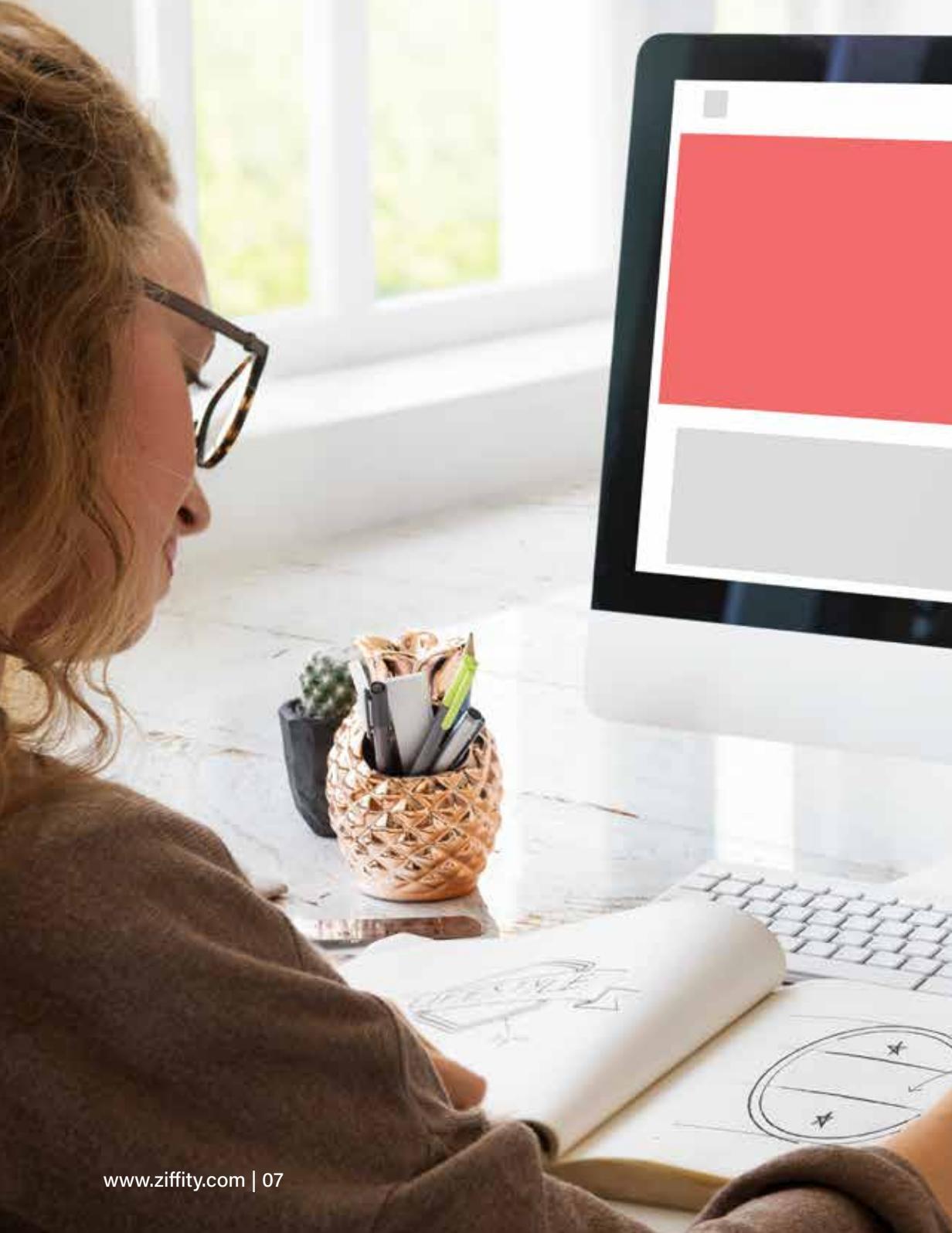


At a basic level, 'bundling' is the process of packaging all JavaScript files into several groups, known as 'bundles.' The result is a reduced number of connections. Advanced Bundling combines these bundles, creating a single, large file. This requires a page-specific approach when building bundles. Home Pages, Category Pages, Product Pages, Carts, etc., each must be separately optimized for JS bundling. A page-wise approach helps in keeping only the necessary JS files required for any given page.

Advanced Bundling also provides provisions to load CSS files before JavaScript. This technique renders page contents faster to users. Advanced Bundling reduces the number of requests drastically and minimizes the size of Javascripts loaded, by sticking to page-specific files.



```
1  {
2      name: 'bundles/catalog',
3      create: true,
4      include: [
5          'addToWishlist',
6          'priceBundle',
7          'priceUtils',
8          'priceOptions',
9          'sticky',
10         'productSummary',
11         'slide'
12     ],
13     exclude: [
14         'requirejs/require',
15         'bundles/default',
16         'mage/bootstrap'
17     ],
18 }
```



# 4

## MAKE PAGE SIZE AS SMALL AS POSSIBLE

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A heavy page laden with too many elements may experience reduced loading speed. Though it's encouraging that a majority of shoppers now prefer mobile engagement to desktop, connectivity strength is not always optimal. Here's a tip to improve Magento 2 load time performance under such scenarios





# GZIP COMPRESSION

Using Gzip, you can compress files to facilitate faster network transfers. By compressing, you provide smaller files that load faster for your frontend users. Gzip helps in decreasing the page to nearly one-fourth of its actual size. With Gzip, you'll be able to compress external scripts like CSS, JavaScript, and font.

You have the option to choose from different compressions levels, which range from 1 to 9. Level 1 means the time taken to compress as well as level of compression is minimal. Level 9 means the compression rate is high, but the time taken to compress is increased. The default compression level is 6, which favors high compression (less file size) over speed.



```
<IfModule mod_deflate.c>

#####

## enable apache served files compression
## http://developer.yahoo.com/performance/rules.html#gzip

# Insert filter on all content
SetOutputFilter DEFLATE
# Insert filter on selected content types only
AddOutputFilterByType DEFLATE text/html text/plain text/xml text/css text/javascript
application/javascript application/x-javascript application/json image/svg+xml

# Netscape 4.x has some problems...
BrowserMatch ^Mozilla/4 gzip-only-text/html

# Netscape 4.06-4.08 have some more problems
BrowserMatch ^Mozilla/4\.0[678] no-gzip

# MSIE masquerades as Netscape, but it is fine
BrowserMatch \bMSIE !no-gzip !gzip-only-text/html

# Don't compress images
SetEnvIfNoCase Request_URI \.(?:gif|jpe?g|png)$ no-gzip dont-vary

# Make sure proxies don't deliver the wrong content
Header append Vary User-Agent env=!dont-vary

</IfModule>
```

# USE CSS/JS MINIFICATION



Magento 2, by default, has the provision to perform CSS/JS minification which can contribute towards reducing page weight.

## SO, YOU CAN DO IT THIS WAY:

In the Magento 2 backend panel, go to Stores > Configuration > Advanced > Developer and enable minification.

Magento has three running modes, namely; Default, Developer, and Production. The Production mode is the fastest option, and minification works only in this mode. First, find out the current mode by running the following command:

```
php bin/magento deploy:mode:show
```

To set your app in production mode and enable minification, run the command given below in the SSH terminal inside the Magento root folder.

**Note:**  
**For Magento versions 2.2+, this menu is visible in Developer Mode.**

php bin/magento deploy:mode:set production



**Configuration** Save Config

**ADVANCED**

- Admin
- System
- Advanced
- Developer**

**GOIVVY PLUGINS**

### Template Settings

### Translate Inline

### JavaScript Settings

**Enable JavaScript Bundling** [store view] No

**Merge JavaScript Files** [store view] No

**Minify JavaScript Files** [store view] Yes  
Minification is not applied in developer mode.

**Translation Strategy** [global] Dictionary (Translation on Storefront side)  Use system value  
Please put your store into maintenance mode and redeploy static files after changing strategy.

**Log JS Errors to Session Storage** [global] No  Use system value  
If enabled, can be used by functional tests for extended reporting.

**Log JS Errors to Session Storage Key** [global] collected\_errors  Use system value  
Use this key to retrieve collected js errors.

### CSS Settings

**Merge CSS Files** [store view] No

**Minify CSS Files** [store view]  No  
Minification is not applied in developer mode.





# OPTIMIZE IMAGES

Images are must-have assets for eCommerce businesses, but optimizing and compressing images is of utmost importance as it directly affects page weight. Having just 1 MB of image size for a catalog with 30 images creates a total of 30 MB to be loaded when the page is accessed at the frontend. In case of poor connectivity or access through mobile devices, such pages might take a long time to load.

Optimize your images for its size but not at the cost of quality, as visuals are an important part when it comes to online shopping. Make sure you have the source file resized. Lazy loading can come in handy, which makes your images load after the page loads first, or when the user scrolls through the pages. CDN (Content Delivery Network) or AWS can be used to render your multimedia assets faster. Further, you can go for the Google PageSpeed server extension.

# CAPITALIZE ON THE CAPABILITIES OF HTTP

HTTP/2.0 is the new-gen hypertext protocol. It's bundled with features mainly focused on making browsing faster and more secure.

When using HTTP/2.0, the browser need not keep going back to the server to fetch every file. Instead, all requests and files are fetched and transferred at once, thus avoiding heavy operations.

Yet another noteworthy advantage is that HTTP/2 helps servers in pushing the resources before a browser (client) requests for it, which significantly improves browsing speed.

Here are the conditions required for Magento 2 to work with HTTP/2.0:

All pages should be served through SSL

The server should support HTTP/2

You can contact your hosting team to assist in setting up HTTP/2.0 and make use of extensions to introduce a server push to your Magento 2 store



# OPTIMIZE TIME TO FIRST BYTE (TTFB)

TTFB is the time taken by a client browser to get a response from a server. TTFB optimization is mainly for pages like cart, checkout, customer profiles that cannot leverage Magento 2's built-in full page cache. TTFB is not required for the rest of the pages, which are more likely to be cached. The following are the ways to improve server response time:

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## AUDIT THIRD-PARTY EXTENSIONS

The third-party extensions you use for your store might be a cause of deteriorating page speed. Find the list of extensions used.

Except for the core Magento extensions, remove the rest of the extensions and perform a speed test to detect the plugins that are slow. You can either go for an alternative replacement or enhance the extension by contacting its vendor.



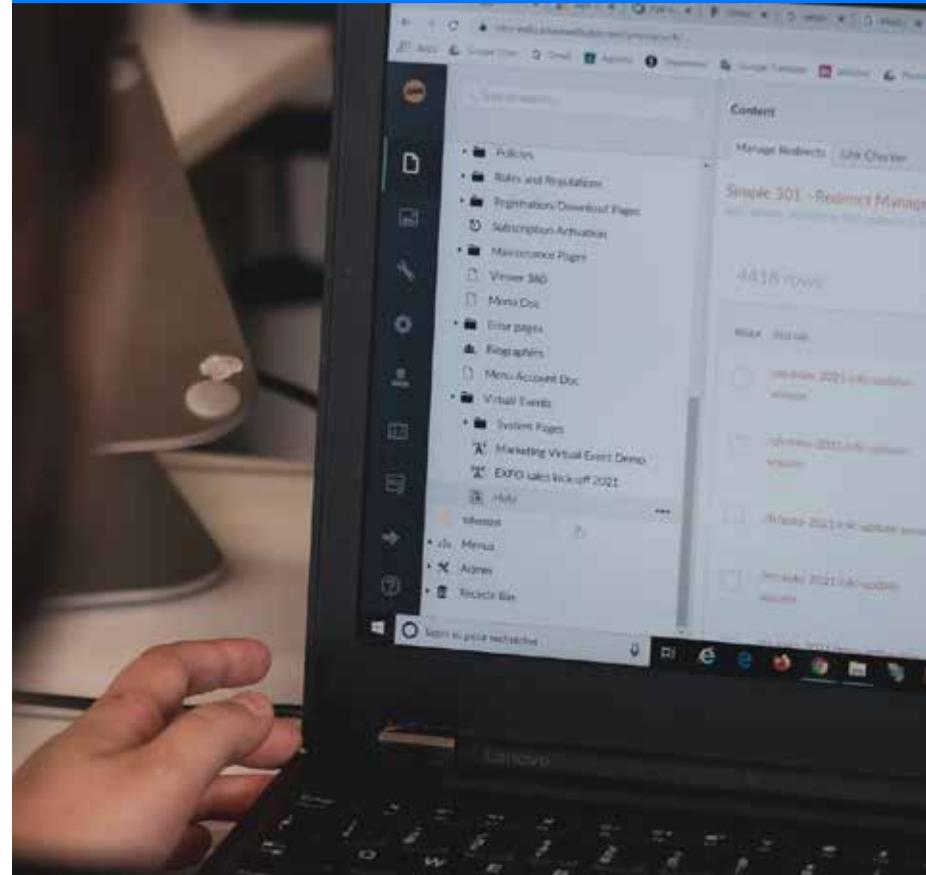
# MAGENTO 2 PROFILER CHECK

Find the origin of the cause that's creating the slowness by running a check using the Magento 2 profiler. The Magento 2 profiler will let you know which part of your code is causing trouble.

# UPGRADE YOUR HOSTING PLAN

The final thing you can do is upgrade your hosting plan. You can get to know whether or not you need an upgrade in your hosting by performing a comparative speed test between your live site and a fresh Magento 2 version in your existing server.

If the new Magento 2 copy is faster than your live site, your current setup is fine. If the result is the other way round, you need to reach out to your hosting team to get it upgraded.





# VARNISH FOR FULL PAGE CACHING

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Implementing Varnish cache is an integral part of your Magento 2 load time optimization process, as it can accelerate your mobile web loading speed by more than 25x.

Varnish cache is a fast cache technology that acts as a temporary storage facility that makes a copy of your eCommerce store's web pages. When a request is sent to render a web page, it is directed to the Varnish server first. It takes only a few milliseconds to render pages from the Varnish server, reducing the load time significantly (time differs based on the hardware capability).

Varnish cache can be used as a failover system, caching reverse HTTP proxy, or load balancer. Using Varnish cache, you can reduce the number of web servers you depend on to support your website and accelerate response time.



# REDIS FOR SESSION STORE AND DATABASE CACHING

To know how important Redis is, let's understand the key distinguishing factors between Session Store and Database Caching.

**Database Caching:** Database Caching is required in order to reduce the server load for dynamic websites, mainly eCommerce stores.

**Session Store:** A session begins when users sign in and ends when they sign out. 'Session Store' is the database that records all the session-related data during this period. The information recorded during such user-session would be profile information, recommendations, targeted promotions and discounts.

Redis is an in-memory database that can be used for Database Caching and Session Store scenarios. Redis, as a cache, provides more control over database caching as its data eviction mechanism can be configured to create space automatically for new data by deleting old ones.

With Redis, you can choose from 6 different eviction scenarios which allow you to evict data proactively or only when additional space is needed. With support from your development team, Redis can be optimized to serve both purposes.



# PWA – PROGRESSIVE WEB APPS

PWAs (Progressive Web Apps) are apps that replicate a mobile app type of user experience but are actually mobile web pages.

Magento has rolled out its own PWA Studio for developers to build faster-loading mobile web pages for eCommerce stores. PWAs can provide a consistent experience on mobile as they are cross-device and cross-browser compatible.

Apart from quick loading speed, it also bundles advantages like quick share, ease in updating, location-based push notifications, better search engine indexing and online discoverability.





# CONCLUSION

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After building your eCommerce store, the first impression that a visitor gets determines the benefits your hard efforts are going to yield. It all begins with how quickly your eCommerce store loads. 3 seconds is what you've got to show users what they need. The first impression counts and probably matters the most. If you achieve that, your store can reap benefits like satisfied customers, returning users, improved conversion rates, and ultimately, sales revenue.

So, needless to say, performance optimization should be your utmost priority, especially for platforms like Magento, oh which offer

out-of-the-box features and high customizability. In this eBook, we have discussed some of the high-priority optimization techniques that can help improve your Magento store's loading time.

If you think your Magento store can improve in terms of performance, Ziffity can help. We've assisted B2C, B2B and B2B2C brands in achieving peak performance. Write to us at [contactus@ziffity.com](mailto:contactus@ziffity.com) to receive complimentary consultation on how to start planning your eCommerce store optimization process.

