How to Speed Up Your WordPress Site

Let's Speed Things Up

People like their websites fast. You know this. You experience this yourself. If a web page takes more than a second or two to load, you're annoyed, or worse, you're leaving. It's the same for visitors to your site and potential customers.

A fast website is crucial to helping your business grow.

WordPress sites are cost-effective, versatile, and powerful. But sometimes they're a bit slow.

We Can Help, By Sharing Our Experience

At Kinsta we run a pretty big WordPress site, it serves millions of visits a month, with helpful posts being published just about every day of the week. And, we host more than 100,000 websites for more than 25,500 happy customers. We've been living and breathing WordPress for more than 10 years.

In this ebook, we share our top 10 tips and actions for site speed.
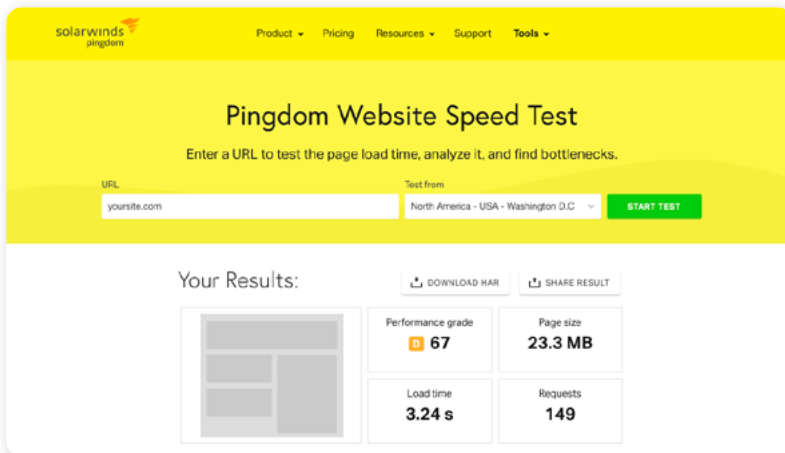
After you've learned these, you'll be on your way significantly improving your site speed. After that, we can continue to help with more than 40 free tips and actions you can do on top of these with our white paper (more on that later).

Contents

First, do a speed test

If you haven't already, it's important to run a speed test and see how your site measures up now. You need a baseline. Do one now, and don't worry if the score is good or bad.

- Check out our article on how to run a speed test. It has detailed information about the best ways to prepare and links to more than a dozen test providers (free and paid).
- If you're in more of a hurry we recommend Pingdom or Google PageSpeed Insights. You can run a test in just a few minutes.

Make some screenshots of the results. Also, copy the data into a document.

Now you have your starting point.

Your Overarching Goal: Reduce

There are four technical terms you may or may not be familiar with when it comes to site speed. We will help you reduce all four of these:

1. **Latency** - The amount of time it takes for data to move from one place to another (for example a web server to your browser).

2. **HTTP Requests** - Any time a web browser asks a server for data (text, images, CSS/Javascript for page styling). We have a dedicated section (7) below.

3. **Network Hops** - The data you request from a server has to travel across the internet (a computer network) and move across multiple devices (like routers), each device the data passes through is a hop.

4. **TTFP** - Time to first byte, a measure of the time it takes for the first HTTP Request to go to the server and for the first byte to arrive back at the browser.

We have more in-depth articles about network latency and TTFB if you'd like to understand more about this. The main thing you need to know is you want these numbers **as low as possible**.

Ok. Let's get to those 10 tips and actions.

Skip Ahead With a Performance Audit

Get some help speeding up your site, before you start!
Get a free performance audit from our team of experts to find which bottlenecks are slowing down your site.

Request a Free Performance Audit

Cache Anything You Can

Caching is one of the most important and easiest ways to speed up WordPress! Here's how it works.

What / Why / How Caching?

Every web page visited on your WordPress site has to be rendered dynamically on the fly. Requests have to be sent to the server, it has to process them (including database queries), and then send the data to your web browser. All that for one page.

This can take a long time if you have a long or complicated web page. Then if you have lots of users doing these on-the-fly page renders all at once, your server can really get bogged down.

That's where caching comes in to save the day! Caching instructs the server to store some files to disk or RAM. Especially the stuff that doesn't change often. This reduces the number of HTTP requests (more on that later). Now your server is doing less work and can render pages faster, for more visitors.
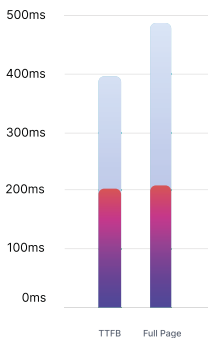
Turn on Kinsta's Edge Caching

49%
⊘ Faster

Average Speed Improvement Results

Results after turning on edge caching on 300+ websites

500ms

400ms

300ms

200ms

100ms

0ms

TTFB   Full Page

Learn how Kinsta **helped development agency MOOBON speed up** their TTFB from 4.89 seconds to 0.043 seconds.

Types of Caching

1. Caching at the Server-Level
2. Caching With a WordPress Plugin
3. Edge Caching

1. Caching at the Server-Level

Caching at the server-level is the best method. This can either be super hard or super easy.

Super hard is if you have to do it yourself. It requires you to have full access to your web server and the knowledge to operate and configure your server. If you are reading this ebook you likely don't have these server skills. And that's fine! You should either use a WordPress Plugin (#2) or rely on your web host.

Super easy, if you have a good web host and they handle caching for you.

2. Caching With a WordPress Plugin

If your hosting provider doesn't provide cache, we suggest one of these WordPress plugins:

- WP Rocket (premium)
- Cache Enabler (free)
- W3 Total Cache (free)

You can also check out some additional options in our in-depth post on WordPress caching plugins.

3. Edge Caching

Edge Caching is a newer caching technology. It stores your often-updated HTML text content as close as possible to your visitors "on the edge", or on a global network of servers. This requires advanced functionality that dynamically updates the HTML content and replicates it all over the world anytime it's changed.

You're not going to build something like this yourself. Instead, you should use a service like Cloudflare with their extensive network of Edge Servers. Ideally, your web host will provide this service integrated into their servers due to the difficulty in setting it up.
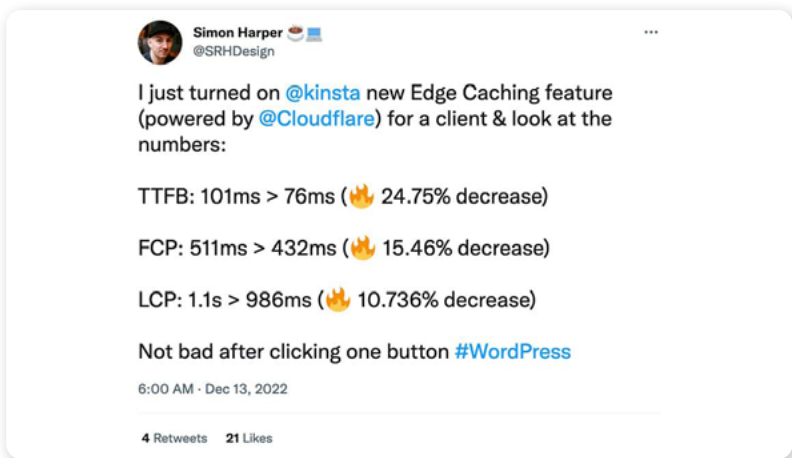
Twitter/Simon Harper. (View on Twitter.)

Take Action

- Ask your web host what caching options they offer, or log into your control panel or dashboard to learn about and configure caching. The tools and interfaces vary widely.
- Install and configure a WordPress caching plugin: WP Rocket (premium), Cache Enabler (free), or W3 Total Cache (free).
- Ask or select a web host that also provides Edge Caching.
- Go more in-depth with caching with our Site Speed White Paper: sections 1.1 and 2.10.

CDNs
Are Essential
for Speed

CDN is short for Content Delivery Network. A CDN is a global network of servers designed to quickly deliver files that don't require database queries such as images, CSS, Javascript, and videos. Each server on the CDN is called a PoP (point of presence). The more PoPs a CDN has, the better. It can serve more people in more places, faster.

A CDN doesn't serve as or replace your main WordPress web host. Instead, it complements it by loading larger static files faster than your web host is able to. The CDN is faster because the PoP is located closer to the visitor, and it's not running database queries.

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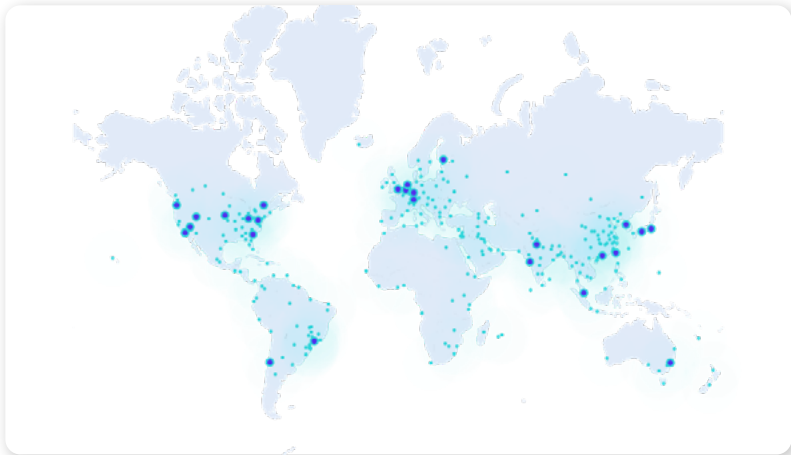
Kinsta includes a CDN powered by Cloudflare with all of their plans as a bonus. You don't have to do anything or set anything up. Just hit "yes" and watch the speed times improve.

Joseph Heather,
Owner Cyntergi | Read Case Study

In most cases your website resides in one data center. Let's pretend it's in London, UK. Imagine how long it takes a JPEG to load for someone visiting your site in Tokyo, Japan. That's a long way to travel! But with a CDN your WordPress site detects the location of the visitor and loads that JPEG image from a PoP right inside Japan. Way faster.

Setting Up A CDN

We recommend using either Cloudflare or Sucuri. These are typically billed on a monthly basis or by data usage. Most providers will have a calculator to estimate your costs. Cloudflare has a free plan as well.

Many web hosts include CDN or offer it as an add-on, which is easier than configuring it yourself. Be sure to check with your web host.

- Learn how to set up a Cloudflare CDN
- Learn how to set up a Sucuri CDN

Take Action

- Ask your web host if they provide a CDN and/or how to enable it.
- Install and configure a Cloudflare or Sucuri CDN yourself.
- Learn more details about CDNs, including speed test results, proxy vs. reverse proxy, and more in our Site Speed White Paper: Section 1.2.

Use a Fast Theme

Everybody loves a brand new WordPress theme, but be careful before you go out and grab the one with all the new shiny features. There are a lot of differences when it comes to free vs. paid themes.

Each element or feature you see in a theme has some impact on the overall speed of your website. And unfortunately, with thousands of themes out in the wild, there are both good ones and bad ones.

Your WordPress has a big impact on site speed and performance. Choose the right one from the start.

So how are you supposed to know which one to choose?
We recommend going with one of the following two options:

- A fast lightweight WordPress theme that is built with only the features you need, nothing more.
- A more feature-rich WordPress theme, that allows disabling features that aren't in use.

Things like fonts, icons, sliders, galleries, video, and parallax scripts, etc. can make your site beautiful, and slow. You probably aren't going to use everything. With a good theme, you should be able to turn off and on each feature. A good theme will also optimize or preload its CSS and fonts, learn more about how this works here.

Search for should start or switch to a WordPress theme that is either lightweight from the beginning or gives you these options. We have plenty of recommendations below in the "Take Action" section.

Warning About Page Builders

Page builders are very popular in the WordPress community. They run on top of your theme and allow you to design your pages with a visual editor, without needing to know how to code at all!

Here are a few things to keep in mind when using a page builder plugin:

- Some page builders might increase load time on your site. This is because they have to load additional CSS and JS to make things work for you without code. That is how the magic happens! We always recommend speed testing your WordPress site before and after installing a page builder.
- You're making a big commitment. Each page you build locks you with that page builder for a long time. Make sure you pick one that is reputable, regularly updated, and has everything you need for the long haul (like a support team).
- Some page builders don't work with some themes. Be sure to research or test on a staging environment.
- Remember, WordPress comes with the Block Editor (also known by its beta name "Gutenberg"). In the last few years, it's become very powerful and easy to use. It won't slow your site down and in many cases, you can use it instead of a paid page builder. Compatible themes can even be edited with the Block Editor using the Full Site Editing feature.

We recommend GeneratePress with GenerateBlocks installed, Elementor, or Beaver Builder page builders. For the most part, they are developed with performance in mind and only add a little bit of overhead. There are also others that are very well made, here is our full list of recommendations.

Take Action

- Consider our top recommended themes; GeneratePress, Astra, or OceanWP. They are more like theme frameworks allowing lots of visual styles. Each theme has free and premium options.
- Check out our extensive list of theme recommendations.
- Learn more about the theme's impact on site speed in our Site Speed White Paper section 2.4.
- Skip to the Conclusion section below to learn about using Application Performance Monitoring Tool to figure out if your current WordPress theme is slowing down your site.

Use Reliable and Reputable Plugins

You may have heard that having lots of plugins on your WordPress site slows it down. This is only partially true, or it's an oversimplification.

You could have 30 or 40 plugins running on your site with no problem... if those plugins are high quality plugins. The more you have on your site, the higher the risk of slowing down your site if those plugins are not written with site speed in mind.

It's not too hard to write your own plugin. And you've probably heard that people are using generative AI, like ChatGPT, to write entire plugins, and they work!

There are many risks with writing your own plugins or using sketchy plugins:

- You have to maintain the code yourself and keep it updated as standards change. These change often. If you are busy, it's better to leave maintaining plugins to the huge community of expert developers who focus on this within the WordPress community.
- A poorly written plugin can introduce a lot of HTTP requests or non-optimized static assets that slow down your site (more on that later).
- The barrier to making a WordPress plugin is fairly low, so many non-expert developers try building them. A plugin may work, at first glance, but that doesn't mean it's fast, secure, or reliable for long-term use.

We recommend only using plugins that are reputable and reliable. There are more than 60,000 free plugins listed on the WordPress.org plugin directory, plus unknown thousands of premium-only plugins made by large and small plugin developer shops. How do you figure out which ones are good? We'll show you in the section below.

Take Action

- Avoid nulled plugins. A nulled plugin is an illegal copy of a paid/ premium plugin that you don't have to pay for. Whoever made this is not being honest with you, and this is not a good starting point. Often a plugin is nulled so it can sneak in malicious code. Always avoid them. Learn more about nulled plugins here.
- Read the reviews on the WordPress Plugin Directory before installing the plugin. Look at how many stars, how many positive reviews, and how often they answer people asking for support (see screenshot below).
- Read reviews sites like G2, or just search around the web and compare multiple reviews. There will be plenty of reviews for any reputable plugin because millions of people use them. If you can't find reviews, that could be a sign the plugin you're considering isn't reputable.
- Strongly consider avoiding the plugins we ban from our Kinsta hosting platform. We do this reluctantly and with good reason. Unless you are confident or have an overwhelming need to use these, we'd recommend avoiding them. Most WordPress hosts have a list of banned plugins.
- Check out our huge list of recommended plugins.

Ratings and support stats on WordPress Plugin Directory

WordPress Plugins and Your Database

One big issue with WordPress plugins is the uninstall process. Whenever you install a WordPress plugin or theme, it stores the data in the database. The problem is that when you delete a plugin using one of the standard methods, it typically leaves behind tables and rows in your database. Over time this can add up to a lot of data and even begin to slow your site down.

Why do plugin developers do this?

1. They want to retain settings for the user. If you delete a WordPress plugin and decide to try it again later, all your settings and data will still be there. While this is super convenient, it's not the most efficient way.

2. They don't care about performance. Some developers might argue that leaving tables behind doesn't impact performance. But imagine a site over the course of ten years, having used dozens or hundreds of plugins, that have generated possibly thousands of rows or tables.

3. They made a mistake. The WordPress plugin handbook even says that "less experienced developers sometimes make the mistake of using the deactivation hook for this purpose."

The good news? There are ways to clean up and get rid of a plugin properly.

Take Action

- Learn how to uninstall a WordPress plugin (the proper way).
- Learn how to manually clean up database tables left behind.
- There is more information about database clean up in our White Paper, see sections 1.4 and 1.4.4.

Use a Data Center Close To Your Visitors

Locating your website in a data center close to your visitors has a huge impact on making your site faster. It will lower latency, TTFB (time to first byte), and network hops.

Use one of the methods listed below to find out where the majority of your visits or customers are coming from, geographically speaking.

If your site is new and you don't have any data on users, place the site in a data center closest to where the majority of your hoped-for target market is located.

Learn how Kinsta helped consultancy Enventys Partners speed up client sites by 50% by locating them closer to their audiences.

Take Action

- Do a ping test to quickly evaluate which region you are closest to. This is useful if you are in the region where the majority of your customers are. Try GCPPing.com to measure Google Cloud Platform, CloudPing for Amazon Web Services, or AzureSpeed Test for Microsoft Azure.
- If you run an ecommerce site, analyze the geographic location of your customers, likely via street address.
- Analyze the geographic location of your site visitors in Google Analytics.
- Ask your web host where your website is located, geographically, and see if migrating to another data center is possible, if that would speed your site up.

Optimize Your Images

According to the HTTP Archive more than 30% of a web page's size is made up of images. This means, if you can optimize your images, you can make your site pages much faster.

Don't think of this as optional; every site should be doing this! Especially when there are many free and easy ways to do it.

Large images slow down your web pages, and in many cases the visitor can't see, visually, the difference between a large and properly optimized image.

Image optimization is the process of making images as small as possible while keeping the visual quality high.

One of the most basic ways to optimize images is to compress images before uploading them to WordPress. Usually, this can be done using the 'Save for web' or 'Export' tools in apps like Adobe Photoshop or Affinity Photo. Or you can use an online tool like TinyPNG or Smoosh. The downside here is this is a manual process. There are ways to automate it with WordPress plugin (see the "Take Action" section below).

File Formats

It's important to choose the right combination of file format and compression type. This allows you to reduce your image size by as much as 5 times while keeping the quality high. You'll have to experiment with each image or file format to see what works best. File formats and compression are complicated topics. Read our in-depth article to learn more, or here is a quick overview of image formats you'll want to use (or not use).

1. **PNG** – Use these for screenshots, product shots, simple images, and illustrations. A PNG of a photograph will be larger than a JPEG.

2. **JPEG** – Use these for photographs and images with lots of colors.

3. **GIF** - These are now considered outdated, use PNG instead for higher quality and lower file size.

4. **Animated-GIF** - Even though we use them for fun memes, this is not the best format anymore. If you are doing animated screenshots or any sort of animation loop, convert your animated-GIF to MP4 video. There are several sites that make this easy like Convertio or the Adobe Express free online GIF to MP4 converter.

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In our testing, we've seen page load times decrease by 73% with automatic image optimization.

Jenna Recktenwald,
DevOps Team Lead at Kinsta

It's important to choose the right combination of file format and learn how our Automatic Image Optimization speeds your site up with just a click.

Take Action

- Install a WordPress image compression plugin to automate the image optimization process. These plugins optimized the images externally (not on your server) to keep your site running fast. Be sure to use a service like this that offers this external/off-server option.
  - Imagify
  - WP Smush
  - Optimole
  - EWWW Image Optimizer
  - ShortPixel
- While you're developing a long-term automatic solution, be sure any images uploaded in the meantime are optimized by using TinyPNG or Smoosh.

Reduce HTTP Requests

Any time a web browser has to load HTML text, an image, CSS, Javascript, or another file or bit of data it makes an HTTP Request to your server (WordPress site). You want to have as few of these as possible for a fast site.

HTTP requests can be reduced, combined, eliminated, or only loaded if needed. Below are the easiest steps you can take to get started.

Run A HTTP Requests Test

First go to gtmextrix.com and run a free test. Click on the Waterfall tab. Here you'll be able to see when and how fast each item loaded on your page. You can sort by HTML, CSS, Fonts, images, and more.

Now you can start to see what is slowing your site down and work to improve your site.
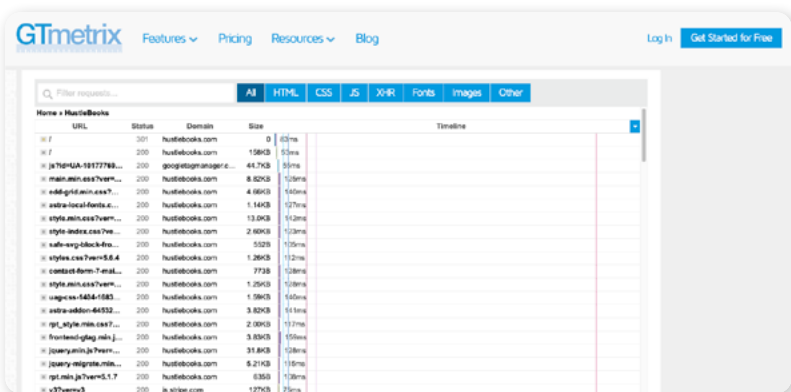
A GTmetrix test showing HTTP requests

Limit Font HTTP Requests

Custom fonts are great for making your site look cool and modern. However, you need to be careful with how you use them because each custom font type that you use adds another HTTP request.

If you're going to use custom fonts, make sure to use as few as possible. Do you really need a different font for your post title and your post body? Do you really need all five font weights? Just call for the two you use. Or see if you can use a system font stack.

The same holds true for icon fonts such as Font Awesome and IcoMoon. Icon fonts can be useful, but you probably don't need to load multiple icon font libraries. It's better to pick just one icon font library and stick with that. And don't forget WordPress has a library called Dash Icons that might suffice.

Eliminate Third Party HTTP Requests

Visitors to your site are also making requests to third party sites. Consider ways to reduce these. For example you could have a clickable thumbnail to a YouTube video instead of loading the video player on your page.

Some common examples of third-party HTTP requests are:
- Embedded YouTube videos – the playable video player embedded on your page makes plenty of HTTP requests to YouTube's servers.
- Google Analytics – the tracking script is hosted on Google's servers, but visitors' browsers still need to download the tracking code.
- Third-party ad services – you'll see tons of third-party requests related to ads if you run them on your site.

Conditionally Load Script HTTP Requests

Some themes and plugins load scripts on every page that are only needed on specific pages.

For example, Contact Form 7 plugin, you probably only need this plugin on a couple of pages (e.g. your "Contact Us" page). However, Contact Form 7 loads its scripts on every single page on your site.

It is possible to conditionally load plugins only where they're needed. If you're not a developer, you can use plugins like Asset CleanUp or Perfmatters. Or, depending on your needs, you can hire a developer to do this type of optimization.

Be Mindful of Plugins HTTP Request Impact

We talked about how plugins can slow down your site in section 6 above. We wanted to make sure that you understand that adding unnecessary HTTP requests can be one of the biggest causes of a slow page.

On the gtmextrix.com test you did at the beginning of this chapter, look again at the **Waterfall** tab. Search the page (**Ctrl + F** on Windows, **CMD + F** on a Mac) for the word "plugins". You can find every HTTP Request on the page from a plugin and evaluate if there is an issue.

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When switching to Kinsta, we immediately noticed faster time to first byte times and much faster load times in general. We estimate that our average TTFB times were reduced by 30-40% after making the switch to Kinsta, which had a similarly positive effect on all of our other performance metrics.

Devesh Sharma,
Founder │ designbombs.com

One type of plugin known for being bad for HTTP requests are social media sharing plugins. Read this article to see more than a dozen of these plugins compared

Take Action

- Learn even more about HTTP requests and ways to eliminate them in our in-depth article.
- Ask your web developer or team how they can reduce HTTP requests in your site's theme and/or plugins.

Minify and Optimize Static Assets

A WordPress site is loading a lot of files. Not only images and HTML, but also JavaScript and CSS. If you can reduce the size and optimize these files you'll have less latency and fewer HTTP requests.

Use Minification on HTML, CSS, and JavaScript

Reduce the amount of data the browser has to download by minifying HTML, CSS, and JavaScript resources. Minification is the process of removing unnecessary characters like comments and whitespace from the source code. It sounds nit-picky and odd, but it works.

These unnecessary characters are useful during development, but they're useless for the browser to render on the live page. You can use a WordPress plugin to do this.

Here is an example of non-minified HTML code.

```
1  <!DOCTYPE html>
2  <html lang="en-US" class="no-js no-svg">
3  <head>
4  <meta charset="UTF-8">
5  <meta name="viewport" content="width=device-width, initial-scale=1">
6  <link rel="profile" href="http://gmpg.org/xfn/11">
7
8  <script>(function(html){html.className = html.className.replace(/\bno-js\b/,'js')})(document.documentElement);</script>
9  <title>editwp &#8211; Just another WordPress site</title>
10 <link rel='dns-prefetch' href='//fonts.googleapis.com' />
```

Here is an example of minified HTML code.

```
1  <!DOCTYPE html><html lang="en-US" class="no-js no-svg"><head><meta charset="UTF-8"><meta name="viewport" content="width=device-width, initial-scale=1"><link rel="profile" href="http://gmpg.org/xfn/11"> <script>(function(html){html.className = html.className.replace(/\bno-js\b/,'js')})(document.documentElement);</script> <link type="text/css" media="all" href="https://mk0editwpn6qbfruw5o9.kinstacdn.com/wp-content/cache/autoptimize/css/autoptimize_499850c34eb7b4e7cbd9d8b41b2a57d6.css" rel="stylesheet" /><style type="text/css" media="print">#wpadminbar{display:none}</style><style type="text/css" media="screen">html{margin-top:32px !important}* html body{margin-
```

Just eliminating all the white space and line breaks really adds up, and removing them can increase your site speed.

We recommend the free Autoptimize plugin or WP Rocket to easily minify your files.

Use Early Hints

If you've already read our Site Speed Cheat Sheet, you may remember we suggested using Early Hints. Early Hints is a newer web standard. You can use it to provide the user's web browser instructions (hints) on files to preload in order to speed up the page load time. Learn more about Early Hints in this article.

Take Action

- There are several more optimizations you can make with how your site loads assets. They are quite a bit more involved than minification. We recommend doing the minification step (above) and then configuring the other nine settings from this ebook first. Then once those are set up, refer to our White Paper sections 3.1, 3.2, 3.3, and 3.4 to go more in depth.

Use Premium DNS

Premium DNS

DNS, short for Domain Name System, is very important and often overlooked. DNS is the main traffic controller on the internet, connecting domain names to actual web servers or websites.

Most people use the free DNS provided by their domain registrar, and never think about it. These free DNS services can be slow or have lots of downtime. Premium DNS can also offer better security and availability, especially when you're under a DDoS (Distributed Denial of Service) attack.

In our tests, we found Amazon Route 53 to be 33% faster than Namecheap.

View Tests

- Free DNS is included with domain registrars like GoDaddy, Namecheap, or Hover.
- Premium DNS providers you can optionally use include Amazon Route 53, Cloudflare, or DNS Made Easy.

Does Downtime Matter That Much with DNS Providers?

The answer to this is really yes and no. DNS is typically cached with ISPs using the time to live value (TTL) on the DNS record. Therefore if a DNS provider goes down for 10 minutes, you're most likely not going to notice anything. Downtime does matter a lot though if the provider consistently has longer and frequent outages, or if your ISP and DNS records both are using really low TTL values.

Take Action

- Run a DNS speed test.
- Compare premium DNS providers to see which one is right for you.
- Read this detailed article on DNS to determine your organization's needs.

Enable GZIP Compression

GZIP is a file format and software application used for file compression and decompression. GZIP compression can be enabled server-side to reduce the size of your HTML, stylesheets, and JavaScript files.

Enabling GZIP can significantly reduce the amount of time to download the page, reduce data used by the visitor, and improve the time to first render your pages. This is pretty standard now across most hosting providers. So much so, you may see warnings and errors in speed testing tools such as Google PageSpeed Insights and GTmetrix without it.

Take Action

- Run a website speed test (see Introduction section above), or look at the test you already ran and see what it says about GZIP Compression.
- Ask your web host if you have GZIP Compression enabled, or ask them to set it up
- Learn more about GZIP Compression in our detailed article.
- Go more in depth with GZIP Compression and see sample code snippets in our Site Speed White Paper section 1.3.

Keep Striving for Speed

Kinsta

You can further explore what's slowing your site down with Application Performance Monitoring (APM). An APM tool captures time-stamped information about your site's PHP performance. You can find bottlenecks and fix them.

Here are two APM services we recommend:

- New Relic
- App Dynamics

Learn more about APM and how it works in our detailed article.

Note: Kinsta-hosted sites include a free powerful APM that you can easily access from your MyKinsta dashboard. MyKinsta also features simple New Relic integration.

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With Kinsta we can now review and analyze each site's metrics at a glance across the board. We're really glad to have gained this functionality.

Mr. Shinji Mochizuki,
Director of the Infrastructure Division | Yappli | Inc |
Read Full Case Study

Performance Audit

Get Help From Our Experts

Want a professional take on your site's speed (or lack of speed)? Our team can find bottlenecks based on our experience over the years.

Request A Free Audit

Try Kinsta Free

Get a White-Glove Risk-Free Migration

Try out Kinsta WordPress hosting risk-free with our 30-day money-back guarantee and a free migration.

Learn About Free Migrations

Explore more resources on enhancing WordPress site speed and performance:

kinsta.com/topic/website-speed