

EBOOK

Simplified Image Optimization

How modern CDN image handling unlocks
big gains for site and application performance

fastly





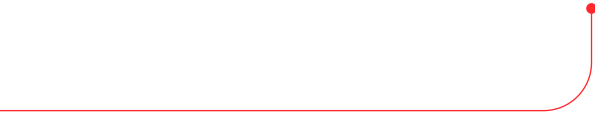
Introduction

Across all industries and verticals, across every business model or business size, and even for non-profits, NGOs, governments and non-business activities site performance is tied directly to success.

Discover the power and freedom you get by letting Fastly handle the effort and cost of image transformation and optimization on the edge – closer to the end user. Image Optimizer is [bundled for free](#) with all of our Network Services packages, so stop paying for bandwidth, and get onto a modern CDN that gets you better performance and more value.

To compete on the internet, speed is critical. Users expect websites to load instantly, and sluggish performance can lead to high bounce rates and lost revenue. But fear not! Fastly is here to help you optimize your images, which make up a huge part of your web page or application's total weight, and deliver lightning-fast experiences to your audience.

Whether your goals are based on better performance, faster load times, cost savings, or productivity improvements for your team, Fastly's Image Optimizer is a fast way to score a big win.



What can affect your performance?

Slow site or app codebase

Plugins, widgets, and third-party tools

Heavy website theme/design

Speed of your host or origin server

Low cache hit ratio

Uncompressed or large file sizes

Images and video content

Lots of page redirects

How Fastly can help

	Superior technology	Bigger caches	Image Optimizer	Edge redirects	Advanced caching	Better compression	Origin shielding	HTTP3/QUIC
Slow site or app codebase	✓		✓		✓	✓	✓	✓
Plugins, widgets, and third-party tools	✓				✓	✓	✓	
Heavy website theme/design	✓	✓	✓		✓	✓	✓	
Speed of your host or origin server	✓	✓			✓		✓	
Low cache hit ratio		✓			✓		✓	✓
Uncompressed or large file sizes		✓	✓			✓	✓	✓
Images and video content		✓	✓				✓	
Lots of page redirects				✓				



Superior POP technology & network architecture

Fastly uses fewer, faster, high-capacity POPs placed strategically around the world to serve more content from cache with lower latency. You save on egress charges, get better SEO, and faster load times.



Serve more content from cache

Our POPs max out their hardware and software to cache more content and keep it in cache longer to reduce trips to the origin server, and improve your site or application's performance.



Image Optimizer

Image Optimizer takes the headache out of managing and transforming images, serving pixel-perfect, bandwidth efficient files. You save one high-res image plus the definitions of how you want to serve it, and we handle the rest. Simple delivery, reduced infrastructure, amazing user experience.



Edge URL redirects

Easily implement your existing redirect dictionaries on the edge and Fastly can resolve the requests closer to the user. Reduce load on your origin and improve latency with an added benefit of cleaning up your logs!



Advanced caching

Cache way more than static content with Fastly, including dynamic and event driven content, frequently changing content, API responses, personalized content, and more. Get even more efficient by invalidating content in milliseconds with Instant Purge.



Static content compression

Reduce file size and gain site speed with Fastly's efficient static compression for every possible part of your site or app (even HTML, JavaScript, and CSS). Combine the benefits of smaller file sizes with a faster cache and enjoy the fastest possible delivery.



Origin shielding

Designate a Fastly POP as a shield for your origin. The shield responds to requests from users and other POPs, and collapses calls to offload the burden from your origin server. Serve more content from cache with even fewer calls to origin.



Modern protocols

We employ the newest and fastest protocols like HTTP/3, QUIC, and TLS 1.3 for optimal performance and availability. We continuously optimize for your benefit so that you can focus on your core responsibilities.

Fastly customers achieve better cache hit ratios (CHRs), resulting in huge improvements in site performance (and cost savings too!)

90% of our requests are cached on the edge



“...We were unable to cache our large audio files, the time to first byte (TTFB) was between 1 and 2 seconds. But with Fastly, 90% of our requests are cached on the edge, and the remaining 10% have a TTFB of 400 or 500 milliseconds, resulting in a significantly better experience for our users.”

— [7digital](#)

10-15% reduction in image size using Fastly’s Image Optimizer



With Fastly, we saw kind of an 18% performance improvement on time to first byte which is pretty impressive. And then I think the other one that we’ve just recently started doing analysis on is AVIF, which is the new image format, we’ve seen 10% to 15% reduction in image size for like all of our core images and vacations are pretty image heavy so it’s really important that we actually continuously reduce that size and then reduce our bandwidth usage.

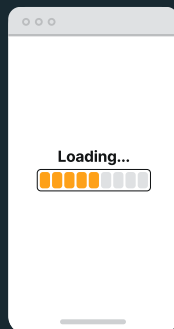
— [David Annez](#)
[Head of Engineering](#)

Small delays cause big problems

40% of users leave a website if it takes more than 3 seconds to load.

88% of online users won’t return to a site after a bad experience.

As page load time goes from:



1s to 3s the probability of bounce **increases 32%**

1s to 5s the probability of bounce **increases 90%**

1s to 6s the probability of bounce **increases 106%**

1s to 10s the probability of bounce **increases 123%**

Source: Google/SOASTA Research, 2017

SEO is more than keywords

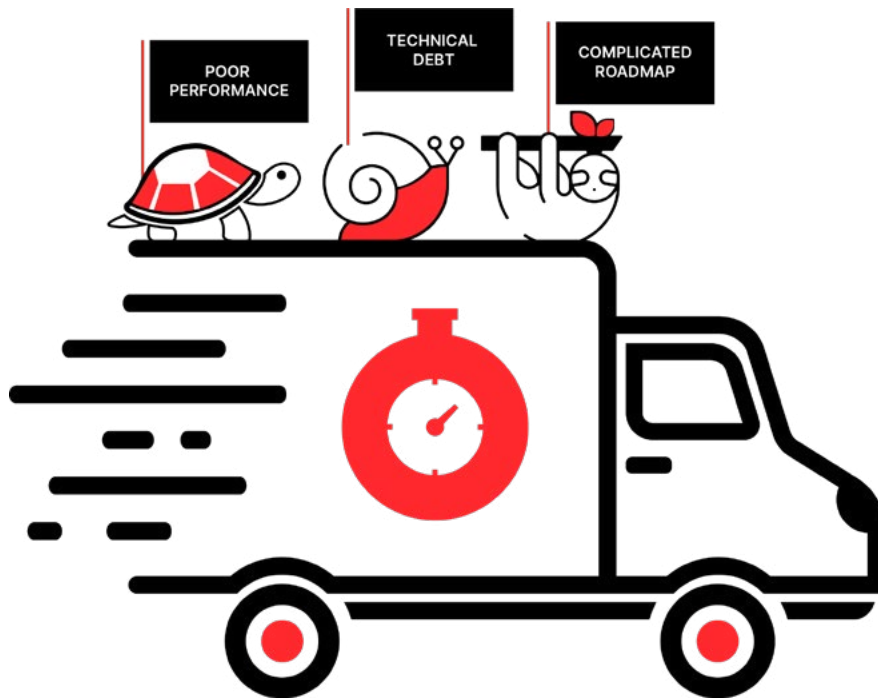
Google's [Core Web Vitals](#) emphasize load times, speed metrics, and your site's performance when deciding how to rank pages, so performance has a direct impact on SEO performance and all of its downstream repercussions like discoverability, organic search performance, and new user acquisition.

If you can't walk faster, make the sidewalk move

Improvement efforts around SEO often live in marketing and web engineering teams where there are often hurdles around resource availability or overcoming technical debt in a site's code or architecture.

If you have business critical dependencies in your code that prevent you from making performance enhancing improvements, then it's like you're trying to run on a sprained ankle. There's no amount of keyword optimization, content creation, or linking strategy that will let you move quickly enough to overcome your negative performance metrics.

Moving your site to a modern distribution platform is like getting onto a moving sidewalk at the airport. While you still can't move that fast, you're getting help from a platform that accelerates your whole site, technical debt and all.



Did you know that DevOps and engineering [choosing the right CDN](#) could have the biggest ROI for improving your SEO scores compared to any other possible action your organization can take? Only 3% of marketers say faster loads are their top priority, so put the whole thing on a platform that gives you that advantage. Give your marketing and SEO activities a boost with an organization-wide performance overhaul.

Just starting with measuring performance?

[Core Web Vitals](#) are a standardized set of metrics that Google has published to help site admins understand what Google cares about when measuring and ranking sites based on their performance. More and more companies are adopting standardized metrics like this for measuring performance because they provide standard quality signals to track over time and measure their progress against site performance goals.

Improving site and application performance through image optimization

Slow load times can be caused by several factors so it can be difficult to pinpoint one thing as an underlying cause. This is why Fastly's offerings across fast delivery, advanced caching, compression, and more are so effective. We can help with all the hardest performance issues, and one of those is image optimization. If you can optimize image handling and serving on your site or application to make every image smaller, with faster load times, and fewer calls to origin it will translate into a huge benefit to your overall performance.

21%

On average, images make up 21% of a web page's total weight. This can go much higher for pages that are image-heavy, like ecommerce sites that need to feature many high quality images for every product page. Additionally, it's going to get worse over time as networks and devices around the world support higher resolution like ultra-high definition and 4k capabilities at higher rates.

Large, unoptimized images can make your website slow, and we already know that site performance is critical for many reasons. But it gets worse — serving unoptimized or poorly optimized images will also cost you more money unnecessarily to pay for the additional bandwidth and egress charges just so you can send an image at a resolution that the receiving device can't even display properly, ruining the experience of your site with a laggy load time.

“

"If breaking news happens and it isn't on our site within seconds, visitors will go elsewhere. With Fastly, updates are reflected on our site pages within milliseconds and we've seen a 20% improvement in time to first byte around the world."

— [Matthew O'Brien,](#)
[Software Architect at The Guardian](#)

Optimized Image handling with and without Fastly

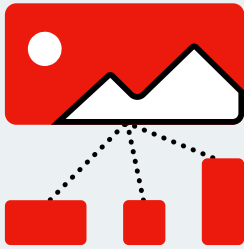
Without Fastly's Image Optimizer, you used to have two equally bad choices

Bad option # 1

Create and manage your own solutions to optimize images internally, and congratulations! Now you own an image handling and optimization process with all its maintenance and technical debt, in addition to your core responsibilities.

Bad option # 2

Avoid the cost of building and maintaining all of the systems and processes necessary for optimized image handling (or applying a ton of hours to do it manually), but you suffer from poor site performance, and higher costs for bandwidth, and egress charges.



Optimized images, edge delivery, and zero headaches with Fastly

When you [pick Fastly](#) you get a lightning-fast, low-latency delivery platform and CDN running on the most advanced and best located Points of Presence (POPs) around the world. You also get a [world class image optimization system](#) at no extra cost, AND moves that work to the edge so it's closer to the end users. Fastly reduces your file sizes and improves delivery speed without reducing image quality.

Your workload without Fastly, handling it on your own

- ✓ Define your image transformation parameters for image specs and format delivery in different cases and devices.
- ✓ Manually crop and resize all images for every channel
- ✓ Or build an internal image transformation and optimization platform that works with the rest of your systems, and maintain it as scopes, tools, and APIs change, plus bug fixes
- ✓ Make sure to include resizing and advanced compression capabilities
- ✓ Are you handling watermarking or blurring, adjustments to image contrast, or image orientation changes or any other image manipulation?
- ✓ DON'T FORGET DEVICE DETECTION!
- ✓ Build and maintain APIs for this product to the rest of your platform
- ✓ KEEP THAT API UPDATED!
- ✓ Metadata management for images

Your workload with Fastly and Image Optimizer

- ✓ Define your image transformation parameters for image specs and format delivery in different cases and devices. (We can help!)
- ✓ Plug that into Fastly



Have a glass of wine or a mocktail!



Get a promotion for doing such a great job and saving time, money, and resources!



Learn to woodwork!

Yikes, that's a lot. You should probably just use Fastly.

5 success stories with image optimization

MEDIA

The logo for imgur, featuring the word "imgur" in a lowercase, bold, sans-serif font. The letter "i" is black with a small green dot above it. The letters "m", "g", "u", and "r" are solid black.

“We use Fastly to serve all of our images — nearly 2 billion images every day, including 1.5 million new images. So there’s a lot of image serving. As a result, requests to the origin have gone down dramatically, which saves us money.”

— [Alan Schaaf,](#)
[Founder and CEO of Imgur](#)

The Challenge

Imgur is the most popular platform for browsing and sharing user-curated images online. With mobile and desktop apps for generating memes and more than 1.5 million images uploaded daily, Imgur has grown into one of the most heavily trafficked websites in the world, boasting more than 130 million global users and 5 billion monthly pageviews.

Because of Imgur’s popularity, they need to quickly serve billions of images without straining their origin servers. They came to Fastly while searching for a content delivery network (CDN) that could integrate with their stack and act as an extension of their application. The Imgur team also uses Varnish, the state-of-the-art web accelerator designed for dynamic content (such as websites, APIs, and mobile applications) on which Fastly was built. They were excited about deploying custom Varnish configurations to the edge of a CDN network.

The Solution

Imgur sought a CDN that could provide the same flexibility and transparency that they have with their own stack. Fastly is currently the only CDN that uses Varnish, which gives customers complete control over their service, including the ability to make and deploy configuration changes instantly without having to go through customer support or professional services.

The ability to self-serve on Fastly is crucial for companies like Imgur that ship new code daily and value speed of innovation. Using either Fastly’s app or API, Imgur can customize their caching logic to match their needs in real time. This allows them to easily integrate Fastly into their team’s development cycle and gives them the control they need to feel confident.

La Redoute



"Fastly helped us focus on our core business — which is not delivering images. We were freed up to focus on delivering our product."

— **Alexandre Marlot**
Web Architect

The Challenge

La Redoute, a French fashion brand had 10 million product images which needed to be replicated and resized across all the channels and devices. This would have been a massive undertaking, robbing the engineering team of approximately six months that they could put to better use.

The Solution

Fastly's Image Optimizer became crucial to their digital transformation. La Redoute was able to offload the massive scope of the project to Fastly, saved them time and resources: instead of a taxing six-month internal project, Fastly optimized the entire image library in roughly one week.

The Challenge

MadeiraMadeira needed to keep up with, and stay ahead of, modern consumer needs. The increase in traffic to its website combined with historical difficulties in providing reliable internet services in Brazil, led MadeiraMadeira to seek out new solutions for scalability.

The Solution

Fastly's CDN gave them the speed and reliability they needed for its online platform. Integrating Fastly's Image Optimizer significantly reduced page load time and increased uptime. Fastly also mitigated the over-traffic coming from DDoS, protecting MadeiraMadeira's infrastructure and improving security.



"We no longer had to worry about a single point of failure or backup systems. And because everything is on the Fastly cloud, it's a Fastly problem. In many ways, we see Fastly as our services platform."

— **Ivan Zamban**
Head of Cloud & Infrastructure

SAAS



The Challenge

RealtyNinja was faced with the task of optimizing real estate images to a variety of end user screen sizes and display types that keeps growing as new devices are released, with hundreds of thousands of jobs running at once, purging the cache every time.

The Solution

Fastly's Image Optimizer offloaded the complexity of that homegrown architecture, moving image transformation to Fastly's edge cloud platform. Optimizing images at the edge reduces latency and simplifies life for the dev team. Now homeowners and buyers get a great experience and top-quality images, on any device they use.



"We choose our tech based on what's the best tool for the job, and what's going to require the least amount of maintenance and technical debt down the road. That's why we chose Fastly. It's a dream to work with."

— **Casimir Loeber**
Co-Founder and
Lead Developer



"Fastly has been a critical part of our ability to scale globally. That's an added value that's been very important to us and our continued growth."

— **Daniel Hultgren**
Chief Operations Officer

ONLINE RETAIL/SAAS

The Challenge

When Litium decided to add a CDN to its customer package, they compared vendors to determine which best fit their needs as a mid-size ecommerce company. The legacy players in the CDN marketplace weren't a good match: they were cumbersome and time-consuming to manage and service.

The Solution

Fastly has allowed them to maintain their backend in Europe but at the same time allow selling in the US and other parts of the world without any degradation in response time. Litium customers report that global response times have improved since putting Fastly in the mix.

Solve even more problems at the edge

- ✓ Ok, so you've chosen Fastly for your content delivery needs and you're taking advantage of Fastly's Image Optimizer.
- ✓ You can easily serve UHD and 4k images to Apple devices that are compatible, while serving lower res images to different or older devices that are not.
- ✓ You are geofencing parts of the world with worse network reliability and bandwidth like areas still dominated by 2G or 3G networks to serve them lower resolution images and improve the user experience, and...
- ✓ Your team is more productive than ever because they have outsourced almost all of this hassle to Fastly.

What else can we do above and beyond image optimization to make our sites perform better, our teams more productive, our costs even lower, and our workdays less stressful?

Image Optimizer + serverless compute at the edge

Compute@Edge is Fastly's serverless compute offering, which offers tons of performance benefits, including that you're running more of your code and your site's operations at the edge, closer to your end user, without multiple time-consuming round trips back and forth to your origin servers.

You can extend your capabilities for image management and optimization to do some amazing things without any sacrifice to response times, speed, or cost-savings. Here are three ways you could further improve performance by moving more to the edge!

1. URL Redirects at the Edge

Handling redirects at the edge reduces calls to origin that can get bogged down with complicated redirect structures, and speeds up load times. It's an easy way to solve for latency created by years of compounding SEO redirect strategies that lets you preserve all the redirects from your site, but serve them faster from the edge.

[Learn more about faster redirects at the edge →](#)

2. Logic at the edge lets you do more with your images

Image optimization is just the beginning of what you can do with Fastly. Our offering includes features like watermarking and blurring, but by adding logic at the edge you can go even further. Check out this example

from one day of a hackathon with The Guardian where they experimented with dynamically adding labels to images. What else would you do with your images?

[See what The Guardian accomplished in one day of hacking →](#)

3. A/B Testing on the edge

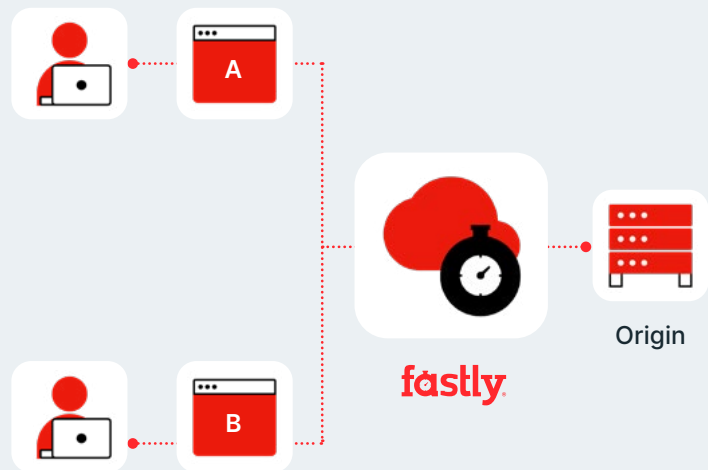
Move application logic to the edge to facilitate A/B testing while still reducing the number of requests to origin. Push new tests out faster and adjust them as needed, improving the experience for your end users.

[Learn more about A/B testing at the edge →](#)

Compute@Edge use case:

A/B Testing

1. End users request a URL from a website that is running A/B testing at the edge
2. Compute@Edge routes the users to two groups and consistently serves them either version A or B of the page. This is served on the edge from the cache, never hitting the origin server.
3. More users are routed to the new page (version B) depending on engagement improvement
4. A/B testing is achieved without adding any latency associated with third-party testing tools.



Contact us

To learn more about Image Optimizer and all the other ways Fastly can make your site faster and more secure. We can't wait to show you what we can do.

[Contact Fastly →](#)

Additional resources

- [Fastly Image Optimizer: Rapid image processing at the edge](#)
- [Blog: It's about time \(to value\) - Announcing self-service Image Optimization](#)
- [Blog: Four reasons you should try Fastly's Image Optimizer](#)
- [Blog: BuzzFeed Optimize Gif-heavy Content with new Fastly Feature](#)
- [Datasheet: Compress, improve processing and deliver high-quality resolution images for your website](#)