

# Akamai Ion



Akamai's industry leading web performance solution makes web experiences fast, reliable, and secure across all end-user situations, while maximizing infrastructure offload and operational agility

End users expect fast, quality web experiences independent of their browser, location, device or network across a wide variety of web experiences — such as consumer websites, mobile sites and apps, business apps, and SaaS apps. Failure to deliver fast, scalable and engaging web experiences can result in lower revenue, lower engagement and higher costs. According to the Aberdeen Group a one-second delay in web page load time can mean 11% fewer page views, a 16% decrease in customer satisfaction and a 7% loss in conversions.<sup>1</sup>

The web has changed in the past few years. The proliferation of connected devices and the rise in application complexity required to deliver fast, secure, quality web experiences demands an intelligent performance optimization solution that will meet the rising expectations of always connected, globally distributed end users.

It's no longer enough to accelerate dynamic web content and deliver web applications in a homogenous way. Intelligence and interoperability are necessary to deliver an effective set of real time, interrelated and layered optimizations that result in an optimal end user experience based on the end user's unique situation and context. Akamai refers to this intelligent, responsive, real-time optimization as "situational performance".

[Akamai Ion](#) is the first and only situational web performance solution – a tightly integrated suite of scale, performance, and intelligence technologies required for real-time web experience optimization based on end users' situations across devices, locations, browsers and networks.

For best-in-class web performance, Ion's intelligent, layered approach to scale, performance and intelligence is tailored to the end user's situation – backed by Akamai's industry leading web performance and availability [Service Level Agreement](#).

“*The implementation of Ion, including the Front End Optimization capabilities, has meant that our internal IT team [members] do not need to become browser optimization experts. Instead, they can concentrate on the site's functional components, safe in the knowledge that Akamai will take care of the performance elements of the site.*

— **Graham Benson**, IT Director, MandM Direct

## Scale

Ion enables organizations to offload expensive web infrastructure, including bandwidth, compute and storage, while providing web and mobile application availability and scalability.

- **Caching:** Ion continuously pulls and caches fresh content onto servers that are closest to end users. Of the world's Internet users, 90% are within a single "network hop" of an Akamai server
- **Advanced Offload:** Ion enables more granular and intelligent caching of dynamic and personalized content based on user segmentation. By conditionally caching these objects, Advanced Offload can improve performance and significantly decrease infrastructure spend
- **Site Failover:** Ion helps web and mobile application availability with comprehensive failover capabilities where Akamai monitors the availability of your origin infrastructure and reroutes requests when the origin is not available

## BENEFITS TO YOUR BUSINESS

### Better business results through fast, secure and scalable web experiences

- Deliver rich, [engaging web experiences](#) that exceed user expectations for speed and availability across devices, networks, browsers and locations
- Increase conversions and engagement while reducing abandonment across mobile and desktop web experiences
- Increase transactions and engagement through uninterrupted availability
- Achieve application scalability and performance under peak traffic conditions

### Reduced complexity of delivery web experiences

- Reduce the cost and complexity of developing, delivering and optimizing rich, engaging experiences to any device, on any network, anywhere
- Gain key insights into how your audiences connect and engage with your brand, across devices, browsers, networks and geographies
- Gain greater agility with self-service configuration and intelligence

### Reduced cost of operations and infrastructure

- Reduce operational cost and maximize network infrastructure offload and web application availability by leveraging the scalability and security of the Akamai Intelligent Platform™
- Focus development efforts on business requirements and competencies, rather than on optimization overhead
- [Deliver quality web experiences](#) across all geographies without infrastructure build-out

<sup>1</sup> <http://www.aberdeen.com/aberdeen-library/5136/RA-performance-Web-application.aspx>

# Akamai Ion

## Performance

Ion offers a fully automated solution for situational [web performance](#) which enables organizations to deliver faster web application responses and anticipate requests in fewer round-trips and bytes, all while improving the performance audiences experience. Ion applies optimizations adaptively based on sophisticated analysis of the web application as well as real-time conditions specific to the end user's environment, such as browser, device, network speed and presence of third-party services. Key capabilities include:

- **Fast DNS:** Akamai Fast DNS leverages a globally distributed and highly scalable Anycast DNS network to act as either Primary or Secondary DNS. Fast DNS support zone apex records thus eliminating costly redirects that reduce page load times.
- **Enhanced Akamai Protocol:** Ion provides significant enhancements to increase efficiencies at the TCP layer when networks are congested. With Enhanced Akamai Protocol, customers can take advantage of the most aggressive mapping and network protocol optimizations Akamai has to offer, helping further improve performance.
- **SureRoute:** Akamai route optimization – known as SureRoute – can identify the fastest, most reliable path to your origin to retrieve and deliver dynamic/interactive content. Inside, the Akamai network proprietary techniques are used to accelerate content delivery and avoid Internet congestion points and unnecessarily long routes.
- **Page Prefetching:** Page Prefetching retrieves the pages most likely to be requested to the Akamai Edge before the user selects them for viewing.
- **Adaptive Image Compression:** Adaptive Image Compression is designed to vary the level of compression for JPEG images based on real-time network conditions, meaning pages load faster and more consistently - even when network conditions are poor.
- **Adaptive Consolidation:** Ion uses Adaptive Consolidation to fetch multiple files with one request but cache each resource separately in the browser, thus avoiding redundant downloads.
- **On-demand Image Loading:** On-demand Image Loading will cause a page to only load the images that are visible within the current browser view, or “viewport”. As the user scrolls down, new images are loaded on demand.
- **Browser-specific Image Optimizations:** New browser-specific image formats, such as Google's WebP, Microsoft's JPEGXR and JPEG2000, allow the same quality of experience to be delivered in a reduced payload size when compared to standard JPEG. Ion dynamically identifies situations where JPEG images can be replaced by browser-specific image formats, resulting in fewer bytes used to deliver a better web experience.
- **EdgeStart:** EdgeStart is a powerful optimization that reduces the time to deliver the first part of the HTML response, which allows the browser to download important resources such as JS, CSS and some images earlier to enhance the user experience
- **Asynchronous JavaScript and CSS:** Asynchronous JavaScript and CSS modifies the way scripts and stylesheets are embedded into the page, making the browser process scripts, style sheets and other resources in parallel
- **File Versioning for Browser Cache Extension:** Many sites only cache content for a few hours due to concerns about old content used from the browser cache when new content is available. This practice all but eliminates the enormous performance benefit of caching for end users returning to a site later – a very common occurrence. Ion uses a technique called File Versioning to solve this problem, by giving each file a unique name. If a resource changes, the old file will be not be referenced anymore, and so all content can be cached in the browser cache indefinitely
- **Domain sharding:** Browsers impose limits on the number of parallel connections per hostnames. Although modern browsers limits tend to be adequately high, older browsers can be restrictive. This leads to artificial dependencies as the browser waits for otherwise independent objects to be fully delivered before proceeding with additional requests. Domain sharding gets around this limit by distributing requests over multiple subdomains, ensuring that the browser does not hit the limit of parallel requests per hostname.
- **Minification:** HTML, JavaScript and CSS files contain comments and whitespace that, while useful to developers, are not needed for the page's operation. Minification is the process of removing such components and reducing the total download size. Ion automatically minifies all page resources, reducing the size of pages without modifying their functionality.
- **Inline small objects:** Inlining is the technique of embedding small external images and scripts directly into the page or resources that reference them. The overall page load time decreases with the reduced HTTP overhead, and the inlined resources are processed faster. Ion automatically embeds resources into pages and CSS files based on their size and other considerations.

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## Intelligence

Ion provides unprecedented insight into the web experiences of your actual customers while empowering the Akamai edge or your origin infrastructure to make decisions based on that intelligence. Key capabilities include

- **Real User Monitoring:** Real User Monitoring (RUM) provides key insight into individual end user experiences by monitoring web pages and collecting performance data from real end users based on various factors such as browser type, geography, OS or protocol (including IPv6). RUM can be used both before and after Ion is activated
- **Mobile Detection and Redirect:** Using a constantly updated user agent database hosted on the Akamai Edge, incoming HTTP requests are evaluated and, optionally, device characteristics are discerned. Redirection responses can then be issued from the Akamai Edge close to the end user, to the appropriate mobile site for smartphones, feature phones, and tablets, dramatically improving response times.

- **Device Characterization:** Device Characterization allows companies to make real-time decisions regarding key capabilities of a particular device requesting a page, in order to make key decisions regarding the specific web experience delivered to a site visitor. Using information derived from the browser's user-agent, the Akamai Intelligent Platform is able to decipher many characteristics of the requesting device – such as screen size, GPS for location-based services, Javascript support, and many more. These characteristics are then made available as part of the HTTP request header, allowing companies to make intelligent decisions regarding how to respond to a particular request.

## The Akamai Ecosystem

Akamai makes the Internet fast, reliable and secure. Our comprehensive solutions are built on the globally distributed Akamai Intelligent Platform, managed through the unified, customizable Luna Control Center for visibility and control, and supported by Professional Services experts who get you up and running easily and inspire innovation as your strategies evolve.



As the global leader in Content Delivery Network (CDN) services, Akamai makes the Internet fast, reliable and secure for its customers. The company's advanced web performance, mobile performance, cloud security and media delivery solutions are revolutionizing how businesses optimize consumer, enterprise and entertainment experiences for any device, anywhere. To learn how Akamai solutions and its team of Internet experts are helping businesses move faster forward, please visit [www.akamai.com](http://www.akamai.com) or [blogs.akamai.com](http://blogs.akamai.com), and follow @Akamai on Twitter.

Akamai is headquartered in Cambridge, Massachusetts in the United States with operations in more than 57 offices around the world. Our services and renowned customer care are designed to enable businesses to provide an unparalleled Internet experience for their customers worldwide. Addresses, phone numbers and contact information for all locations are listed on [www.akamai.com/locations](http://www.akamai.com/locations).