



BEYOND THE MORATORIUM

Scaling for Peak in Times of Unpredictability

E-BOOK

BEYOND THE MORATORIUM

Scaling for Peak in Times of Unpredictability

The moratorium. For decades, it's been the preferred approach to scaling for peak traffic. But for all those years, most traffic surges were predictable. Now, they're not. And in times of unpredictability, many industry leaders are asking the same question, "Is it time to let the moratorium die?"





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http.HandleFunc("/status", func(w http.Respon
thisPollChannel <- reqChan; timeout := time
{ fmt.Fprintf(w, "ACTIVE"); } else { fmt
"TIMEOUT"); }); log.Fatal(http.ListenAnd
"net/http"; "strconv"; "string"; "time
c main() { controlChannel := make(chan
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MORATORIUM

An intentional suspension of changes to IT systems, applications, and infrastructure to avoid the introduction of potential defects that limit the ability to handle peak traffic.

TRAFFIC PEAKS

Surges of both legitimate traffic (customers, visitors, API calls, search bots) and illegitimate traffic (malicious bots and cyberattacks) that can create profound challenges.

More traffic, more revenue ... that's been the mantra of online business ever since there was online business. But just like on the freeway, when traffic builds too quickly, it can lead to crippling gridlock. Sites and applications that fail to scale for these spikes in usage can face dire repercussions.

These surges can overwhelm existing infrastructure, degrade performance, and even cause widespread outages. Customers might encounter longer wait times, error pages, and frustrating glitches. The result? Customers end up taking their business – and their loyalty – elsewhere. ***In fact, research from Google and Deloitte demonstrated that “as page load time goes from 1 second to 3 seconds, there’s a 32% increase in bounce probability, and as page load time goes from 3 seconds to 5 seconds, there’s a 90% increase in bounce probability.”¹***

Typically, peak traffic events are seasonal. For example, online retail sites see the most visitors around holidays. Media sites see increases around concerts and sporting events, and businesses tend to see a rush during product releases. But all of these events have one thing in common: They’re fairly easy to predict, making it easier for businesses to ready themselves.

Not anymore ...

¹Google, SOASTA/Akamai

RETHINKING PEAK

Once, Peak Was **Predictable**.
Now, It's Not.

Due to a convergence of multiple social, technological, environmental, and health trends, we're currently seeing drastic shifts in user behavior and patterns, increasing volume across the board, and most importantly, causing a lack of predictability for when traffic peaks are likely to occur. And frankly, we're all still wrestling with the ramifications of these changes, and working without meaningful predictions or forecasts for the future of traffic.

LIVING IN AN INCREASINGLY DIGITAL-FIRST WORLD:

Global internet traffic, as seen by Akamai, **rose 30%** from the end of February to the end of March 2020, **and stayed stable** at that level through April.



In this new world, peaks in traffic can come at any time, while the seasonal ones we used to plan for might not happen at all – and even if they do, we can’t predict what they will look like. In fact, some sites are experiencing their traditional peak every single day.

Meanwhile, digital properties – often our only replacement for in-person interactions and transactions – are more critical than ever.

Q1 2020 Peak Traffic Was >2x Q1 2019 Peak Traffic

Peak traffic levels on the Akamai Intelligent Edge Platform are up more than 2x from March 2019 to March 2020, at 82 Tbps and 167 Tbps, respectively.

Clean Traffic Growth in March 2020

The secure application access traffic trend seen on Akamai’s Prolexic DDoS platform, versus consumer traffic to public-facing websites, indicates an increase in remote application access.

While the stakes are high, and so much seems to be out of our control, there's opportunity to be had. This is the time to reconsider how we think about peak, and how we prepare for it. It's a chance to build something better – a more resilient, flexible digital site or app. And thus a safer, stronger business and brand.

Here are some critical questions industry leaders are asking:

- What will traditional, seasonal traffic peaks look like going forward?
- For how long will traffic patterns – including surges – continue to change unpredictably?
- What will future regulations look like? How will user behavior change?
- Will my brick-and-mortar stores be closed or open during my next big sales event?
- Will the next large sports tournament or concert still happen?

Modern digital sites and applications are complex. Scaling adds complexity on top of complexity, and therefore must be handled carefully.

Some factors to consider:



PAGE WEIGHT



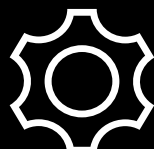
IMAGES



INTERACTIVITY



THIRD-PARTY CONTENT



API CALLS



MOBILE DEVICES



CELLULAR CONGESTION



JAVASCRIPT

As Times Change, So Should Your Scaling Strategy

Once, the moratorium was the gold standard in peak preparation. But even in the best of times, shutting down digital platforms can hinder flexibility, innovation, and adaptability. In these ever-changing times, the same challenges are compounded by the near-impossibility of timing a moratorium for unpredictable traffic surges.

Instead of implementing moratoriums, organizations might explore the possibility of dynamically scaling their digital properties – any time they want. Because despite the complexity of modern web applications, with their many moving parts deployed across heterogeneous environments, it is now possible to scale on demand and only when digital sites or applications truly need it – not just for predictable, seasonal events that allow for months of preparation and system freezes.

KEEP MOVING FORWARD

Prepare for **Any** Peak

Your preparation should begin with analytics, modeling, and insight, so you can formulate a better understanding of exactly what's happening, what could happen, what the consequences of different variables could be, and what to prioritize.



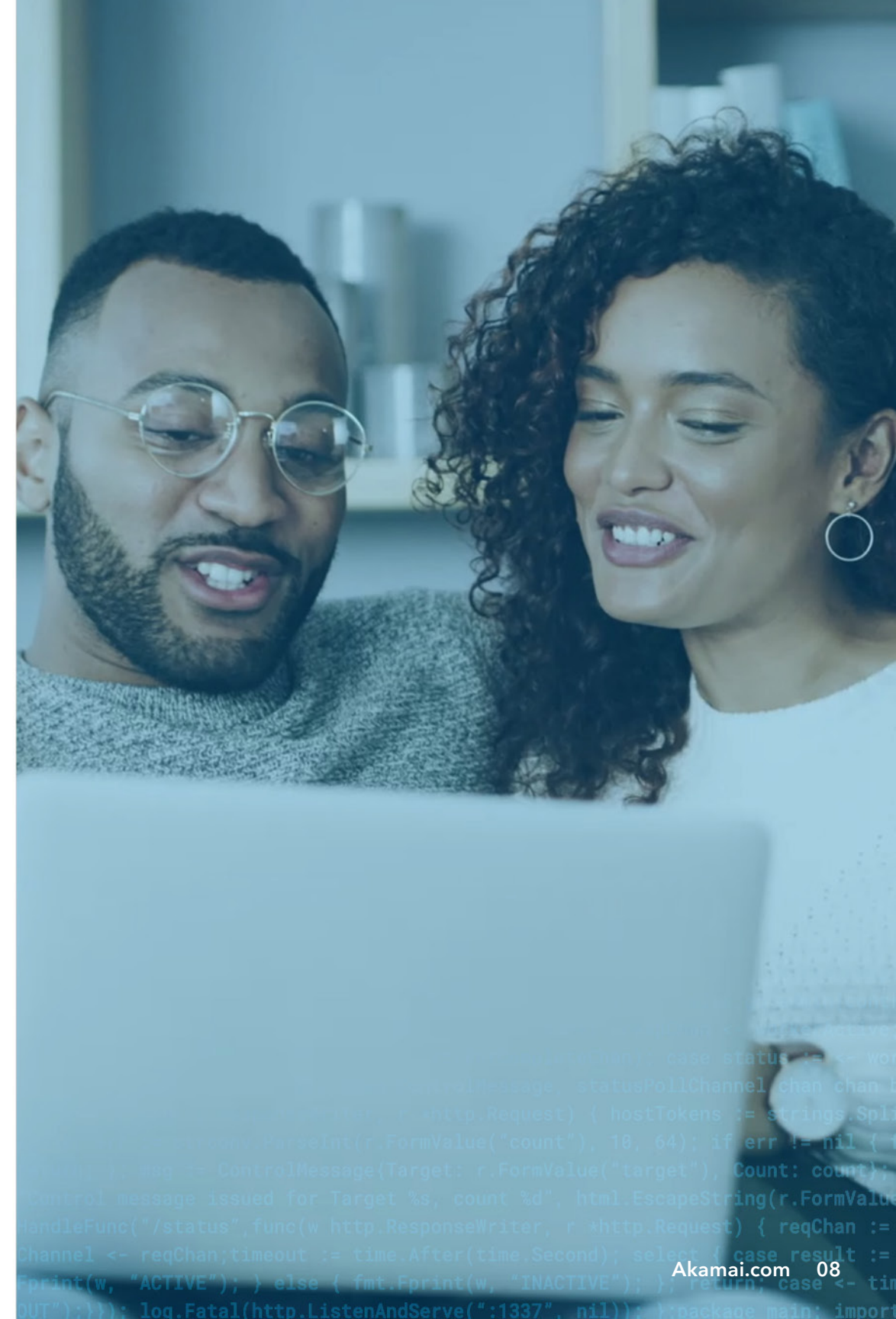
Five Steps for **Getting Ahead** of a Peak

01: Distinguish Your Real Users from Bots and Attack Traffic

Today's applications and sites are already under enough pressure from real user traffic. Bots add tremendous volume on top of that, oftentimes larger than the traffic from human users. While bots do a lot of good things, such as indexing your sites for search engines, malicious bots impose a significant problem. DDoS attacks and other hostile activities on top of the legitimate traffic can turn into a significant threat during a peak. Proactive **bot management** and **DDoS protection** provide the ability to distinguish between good and malicious traffic, ensuring that only desired traffic reaches your systems during a surge, creating real revenue in an optimally performing environment.

02: Monitor and Understand Your Real Users (Not Just Simulated Users)

In order to prioritize which bottlenecks impact business the most, organizations can gather insight into how real users experience their site and what is inhibiting a smooth online customer journey. Equipped with **real user monitoring** (RUM) data, organizations can then prioritize which bottlenecks have real impact on the user experience, customer journey, conversions, and, ultimately, revenue.





03: Load Test Your Application or Site to Attain Insight into Weaknesses

Regardless of what traffic challenges await, few strategies can safeguard web applications as reliably as synthetic **load testing** – in particular if you feed insights from your bot management and real user monitoring (steps 1 and 2 on previous page) into your simulation and play back real-world scenarios previously captured on your site. Load testing gives you: 1) the ability to simulate traffic peaks from millions of clients across multiple devices and browser types, and 2) better visibility into hidden bottlenecks and/or failure points.

04: Optimize Your Performance and Dynamic Scaling Setup

Use the insights from steps 1-3 to specifically address the **performance** bottlenecks that have been identified as having high impact, and extend your dynamic scaling measures accordingly. Dynamic scaling includes smart load balancing, route optimization, instant failover, moving compute tasks and scripts to the network edge (and off your servers), intelligent caching, and dynamic byte reduction of large image and video files. The right combination of these capabilities can drastically increase a site's ability to handle peaks, and reduce or eliminate the need for preparation efforts and moratoriums – which can be expensive and detrimental to efforts aimed at adjusting sites and applications quickly in a fast-changing marketplace.

05: Prepare for the Unpredictable with “What If” Models

No one knows with any certainty what the future of peak traffic will look like. Not for traditional seasonal surges, nor the times in between. **Real user monitoring** (RUM) with “what if” modeling enables organizations to quickly determine what impact a hypothetical change of traffic volume (or other parameters) would have on performance, load times, visitor retention, conversion rates, and other business metrics.

Scaling for Peak with Akamai

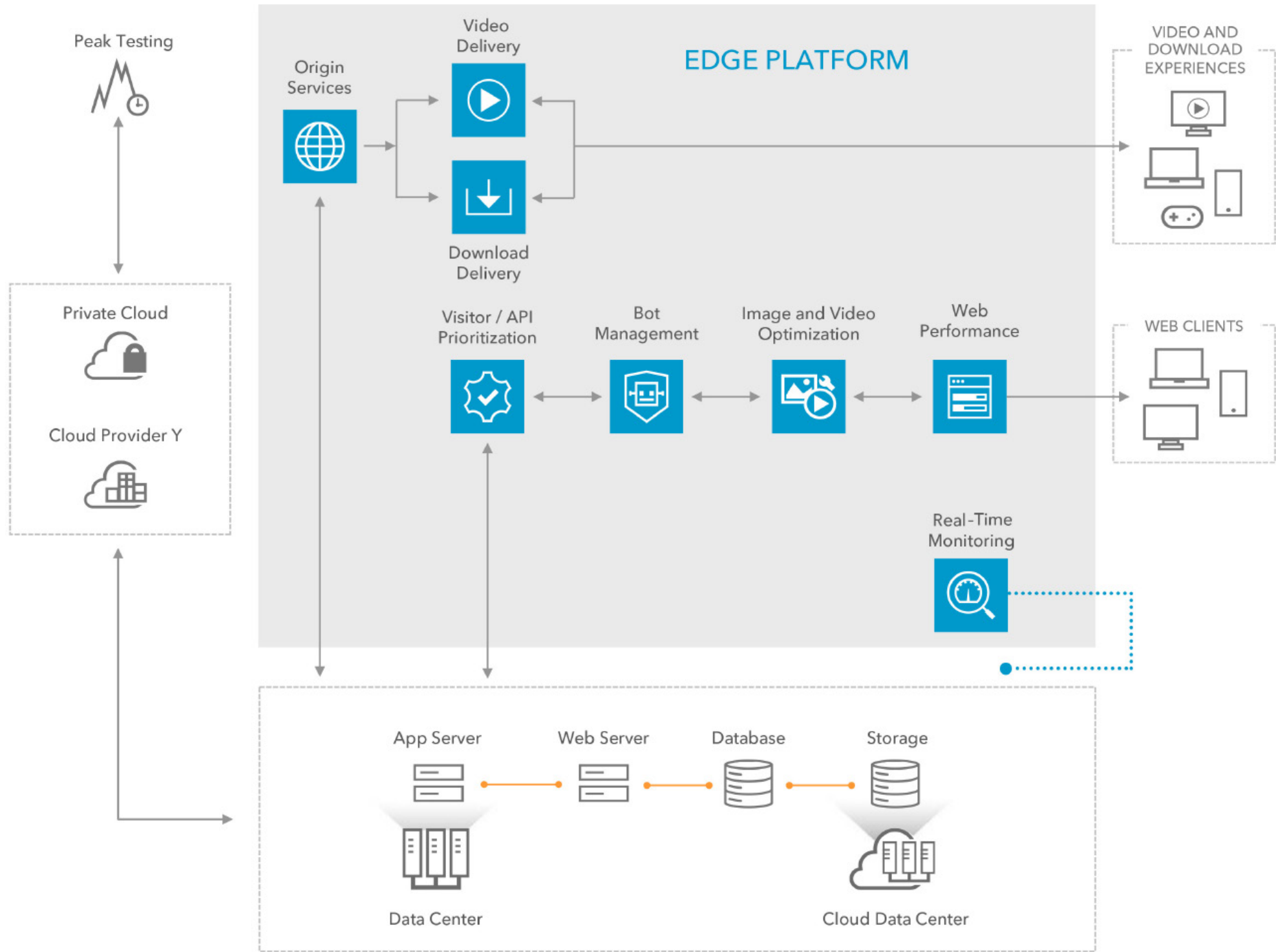
Even in the face of unprecedented demand, the **Akamai Intelligent Edge Platform** can help you prepare for whatever peaks await you, all while providing an unmatched digital experience for users, every time. Give your customers instant and memorable experiences with industry-leading solutions to test for scalability, prioritize bottlenecks, optimize availability and performance, prevent attacks, and predict in real time how sites and apps will respond in a changing landscape.

THE AKAMAI INTELLIGENT EDGE PLATFORM:

With over 300,000 servers in 4,000 locations across 137 countries, it is the only global, massively distributed edge platform with the scale, resiliency, and security that businesses demand. Top brands globally rely on Akamai to help them realize competitive advantage through agile solutions that extend the power of their multi-cloud architectures. Akamai keeps decisions, apps, and experiences closer to users than anyone – and attacks and threats far away. The result? A seamless and instant digital experience for customers – despite unprecedented and unpredictable traffic.

Reference Architecture: Scaling for Peak

With industry-leading solutions for real user monitoring, bot management, load testing, performance, and DDoS protection, the Akamai Intelligent Edge Platform helps you prepare for spikes in demand and optimize resources, offloading when they hit to provide the best experience for your customers.



BOT MANAGEMENT AND DDoS PROTECTION

Bot Manager

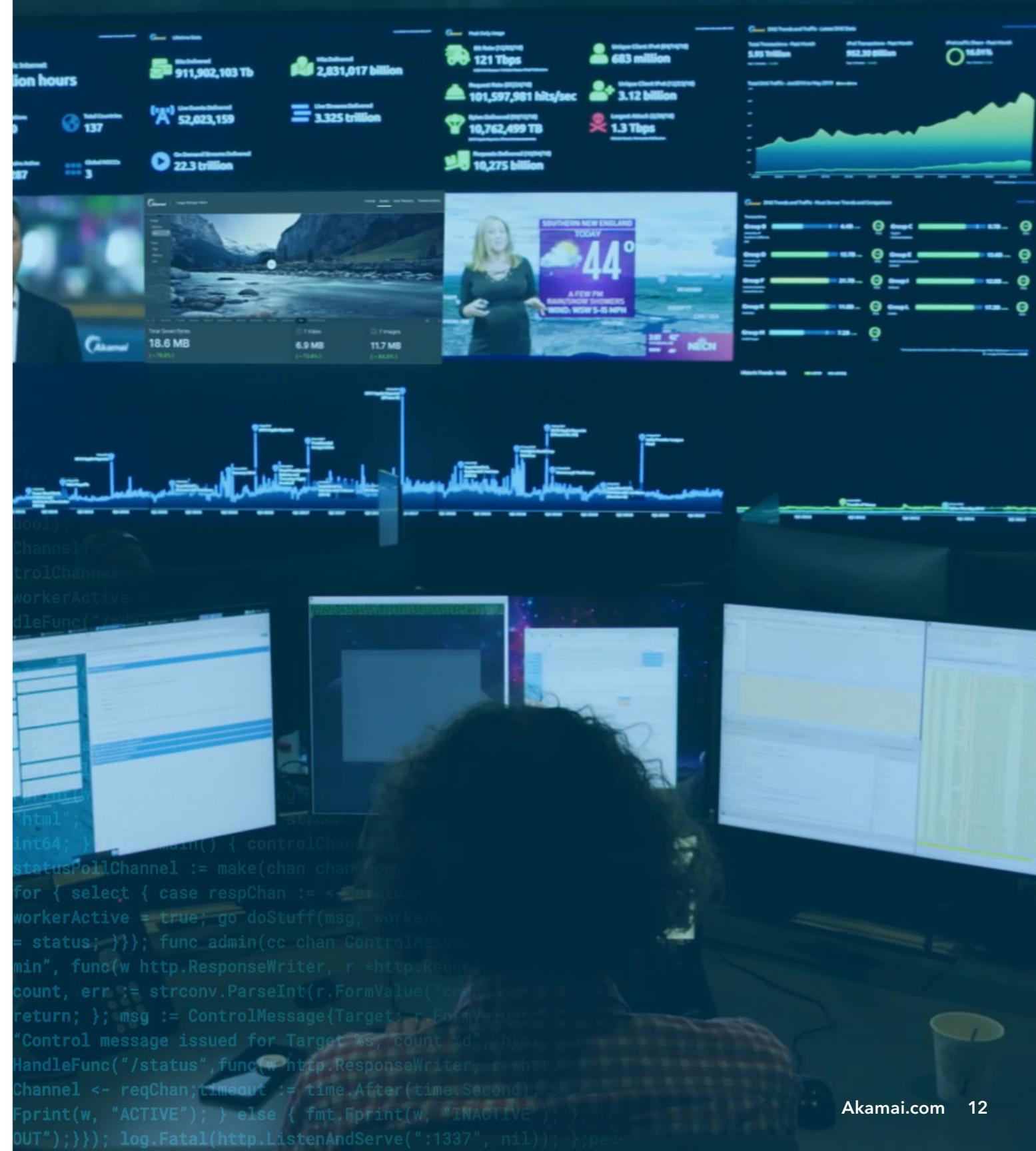
Akamai's [Bot Manager](#) delivers advanced bot detection to spot and avert the most evasive threats. Bot Manager detects, identifies, and manages bots at the edge – before they get to your applications or data centers. It also integrates with other Akamai security solutions, including distributed denial-of-service (DDoS) protection and web application firewall (WAF), for comprehensive application security.

Web Application Protector

If you have limited security expertise, [Web Application Protector](#) provides automated WAF and DDoS defense, specifically designed to offload the complexity associated with a traditional WAF. Easy to deploy and manage, Web Application Protector is backed by the scale and reliability of the Akamai Intelligent Edge Platform – so you worry less about threats and focus more on growing your business.

Kona Site Defender

[Kona Site Defender](#) is designed to protect critical websites, web applications, and APIs against even the largest DDoS attacks, stopping network-layer attacks instantly and automatically mitigating application-layer attacks within seconds. This allows businesses to reply to the latest threats and prevent attack traffic from bringing their sites down or impacting performance, during peak times and at any time. Kona Site Defender's accurate detection capabilities are architected to deny malicious attacks without impacting legitimate users.





Akamai is the world's leading edge and CDN provider. There is no way we could have delivered some of the huge-scale sporting events that we have had. We've had the Australian Open. We've had the Commonwealth Games, Melbourne Cup, PyeongChang Winter Olympics. Without Akamai as a partner, we would not have been able to actually do that.

– Darren Kerry, Director Product & Technology, Seven West Media



REAL USER MONITORING

mPulse

Akamai's real user monitoring (RUM) solution enables companies to monitor, find, and fix website and application performance issues. Even more importantly, [mPulse](#) lets them not just identify bottlenecks, but understand which of these have actual impact on real users and on business metrics, such as conversion and signup rates, page views, visitor retention, page abandonment, and, ultimately, revenue. mPulse anomaly detection identifies unusual behavior and triggers alerts in real time, and integration with Akamai's Bot Manager provides the ability to segment data by visitor type (human vs. bot), and monitor business and performance metrics associated with bots.

LOAD TESTING

CloudTest

Stress-test your environment and ensure that your site or application is ready for any sudden spikes in traffic. [CloudTest](#) helps you design your evaluations at any scale or stage of production and interpret the results. You'll see what the problems are and where they originate, so you can fix them before they affect your customers – and your business.

PERFORMANCE

Ion

[Ion](#), Akamai's flagship performance solution, is a suite of intelligent performance optimizations and controls that helps deliver superior web, iOS, and Android application experiences. Built on the SLA-backed availability of the globally distributed Akamai Intelligent Edge Platform, Ion continuously monitors real user behavior – applying best-practice performance optimizations automatically – and adapting in real time to content, user behavior, and connectivity changes.

EdgeWorkers

[EdgeWorkers](#) lets developers run JavaScript code serverless at the edge. Instead of using browser clients or origin servers for these tasks, the edge provides another option to run critical web application logic. Teams can quickly create functions and deploy them across the entire globally distributed Akamai Intelligent Edge Platform, offering robust scalability and performance while also accelerating development and deployment times.

Global Traffic Management

[Global Traffic Management](#) optimizes the availability and performance of web applications and APIs with instant failover and rerouting. This helps to reduce the strain of increased bandwidth consumption through flexible and intelligent route optimization based on a combination of policy rules and real-time monitoring of internet and data center health.

Image & Video Manager

[Image & Video Manager](#) is a software as a service (SaaS) solution that intelligently and automatically optimizes and enhances images and videos for every user on the fly. It provides each user the ideal combination of quality, format, and size that is best suited for that user's device, browser, and network connection at the very moment they access a website or mobile app.

Cloudlets

- [Application Load Balancer Cloudlet](#) efficiently scales your cloud and physical infrastructure, while customizing routing rules and control session behavior for your web application traffic – maximizing application performance and availability with fast, flexible, and reliable load balancing.
- [Visitor Prioritization Cloudlet](#) provides your customers with a user-friendly waiting room to maximize brand and business continuity if you encounter back-end overload during peak traffic.
- [Edge Redirector Cloudlet](#) easily manages and offloads high volumes of URL redirects to the Akamai edge for operational simplicity and enhanced website performance.

THE ROI OF PERFORMANCE IMPROVEMENTS:

“With Akamai, we can pinpoint performance degradations and substantiate the value of performance improvements to optimize the customer experience and, in turn, our revenues.”

– Stuart Gray, Senior Platform Engineer, Shop Direct



Despite significant increases in traffic, Akamai saw customer website page load times – on desktops and mobile browsers – improve globally when comparing Q1 2019 to Q1 2020. This highlights that platform and product improvements have overcome peak traffic challenges and concurrent user bottlenecks.

Because peaks have become so unpredictable, it's essential to work with a platform designed to ensure you are ready for any surge in traffic, expected or not. The Akamai Intelligent Edge Platform allows businesses to scale on demand and only when digital sites or applications truly need it. With Akamai, you can provide your customers with a superior and consistent digital experience at any level of demand.

Contact Us to **Prepare** Your Business for Any Level of Demand

[Learn more](#)

Akamai secures and delivers digital experiences for the world's largest companies. Akamai's intelligent edge platform surrounds everything, from the enterprise to the cloud, so customers and their businesses can be fast, smart, and secure. Top brands globally rely on Akamai to help them realize competitive advantage through agile solutions that extend the power of their multi-cloud architectures. Akamai keeps decisions, apps, and experiences closer to users than anyone – and attacks and threats far away. Akamai's portfolio of edge security, web and mobile performance, enterprise access, and video delivery solutions is supported by unmatched customer service, analytics, and 24/7/365 monitoring. To learn why the world's top brands trust Akamai, visit www.akamai.com, blogs.akamai.com, or [@Akamai](https://twitter.com/Akamai) on Twitter. You can find our global contact information at www.akamai.com/locations. Published 12/20.