5 ONLINE DELIVERY CHALLENGES SOLVED

LESSONS FROM THE REAL WORLD: HOW LEADING COMPANIES SOLVE TOUGH CONTENT DELIVERY CHALLENGES

Why do so many companies turn to a Content Delivery Network (CDN) to deliver their online videos, websites, and downloads? It’s simple: The core benefits of a CDN directly improve customer experiences. End-users get the content they want quickly and reliably with better quality, wherever they are located. More satisfied customers help the organization increase revenue and customer loyalty.

CDN adoption is all about wanting to ensure quantity and quality. The quantity of online content delivery is growing rapidly. Internet traffic will increase threefold and mobile data traffic will increase sevenfold between 2017 and 2022. At the same time, expectations of quality are higher than ever. Nearly two-thirds of people will abandon a video that rebuffers twice, with similar abandon rates for other types of content.

To deliver rising traffic volumes and satisfy higher user expectations, companies are increasingly using CDNs. By 2022, 72% of all global internet traffic will cross a content delivery network, up from 56% in 2017.

As a leading global CDN, Limelight Networks has extensive expertise in helping organizations across industries, workflows and company sizes improve their online performance. We have a deep understanding of the complexities of providing the best possible online experiences to a global audience and have dramatically improved performance for customers in the face of a range of tough challenges.

We have built one of the largest, highest-capacity, most innovative CDNs in the world. The five most common content delivery challenges include:

1. Growth and scale
2. Performance
3. Delivery to any device
4. Geographical capacity
5. Internal resource constraints

We’ll explore these in more details, using real-world case studies, how organizations are successfully addressing each one.
CHALLENGE #1: GROWTH AND SCALE

Many companies struggle to manage through various stages of growth, and the stakes are high. According to Limelight’s State of The User Experience report\(^4\), nearly half of visitors will leave a website that takes more than five seconds to load, and 43 percent of people will leave a website and purchase a product elsewhere if they feel the site is too slow.

In early stages when audiences are small, basic web or video hosting may be sufficient. But, as companies expand and their audience grows, they reach a point where basic hosting fails to deliver the required performance and scalability. Increasing traffic puts more stress on key components like web and video servers and the access links to those devices. Response time can become slower and slower for all users. Throughput can decrease. Above a maximum threshold, new sessions will simply fail. As these issues compound, user experience suffers. Symptoms vary depending on the application and can include slow web page loading, stalled or poor-quality video, high latency on live video, and file downloads that take too long or fail altogether and need to be restarted.

HOW A CDN HELPS

To sustain growth and momentum, companies often engage a content delivery network. A well-managed CDN dramatically improves the capacity for growth and scale. Instead of overwhelming one origin source, a CDN replicates popular content in many locations near the edges of the network. In modern CDNs, these locations, called Points of Presence (PoPs), are data centers with high-performance servers that can cache content. When a user requests a piece of content, the CDN looks for the content in cache in a nearby PoP, retrieves it and forwards it to the user’s last-mile provider for delivery. A modern CDN has the capacity to serve large numbers of users worldwide, each from the best PoP for that user’s needs.

TECHNICAL CHALLENGES

- Inability to support capacity, performance, and features as the business grows
- Oversubscribed infrastructure or services such as origin servers and access links

BUSINESS CHALLENGES

- Risk of stalling growth and missing business objectives
- Risk of customer churn

The Limelight Solution

Limelight operates one of the world’s fastest, highest-capacity global CDNs. Best-of-breed cache hit performance coupled with a private backbone means greater origin offload, better performance and lower bandwidth costs for Limelight customers.

TOPPR

Deliver eLearning videos to a large growing audience

CHALLENGE

Toppr is an e-learning company based in Mumbai that offers a comprehensive after-school learning app for K12 students. As Toppr’s business grew to 2.5 million students and 8,000 videos, it needed a solution to improve the user experience and deliver videos of lessons as fast as possible.

SOLUTION

Toppr decided to implement a Content Delivery Network (CDN) to improve video performance and ensure high availability. Toppr tested 200 videos through four CDNs. Limelight had the best performance and was selected as the CDN to support Toppr’s fast-growing business. The solution includes Limelight Origin Storage, featuring automated regional replication that distributes content geographically and retrieves from the closest location.

“To improve our go-to learning app, we conducted extensive testing with multiple CDNs and chose Limelight because it had the lowest buffer rate by far.”

Vice President of Knowledge, Toppr

Read the Toppr case study.
CHALLENGE #2: PERFORMANCE

Providing high quality of experience to end users is critical to businesses. The meaning of quality of experience varies depending on the application. In streaming video, high quality generally means a fast start of video playback, consistently high image quality and frame rate, and no rebuffers. A satisfying web experience includes fast page loads, responsive interactions, and smooth playback of any embedded videos and animations. File downloads need to start quickly and proceed at a sustained high rate without interruption. Today’s audience expects these quality attributes regardless of file size and where they are located.

HOW A CDN HELPS

Performance of the delivery network is one of the most important factors that determine the quality of experience. How is quality of experience impacted by delivery performance? Again, that depends on the application.

For high-quality video, the CDN must start playback as quickly as possible, sustain sufficient throughput for high-quality video, and be architected end-to-end to minimize rebuffers. A satisfying web experience requires fast delivery of static content like images, text, and video as well as dynamic content that changes with each user. File download should start in milliseconds and sustain high throughput regardless of file size and where users are located.

There are a number of CDN attributes that contribute to a fast online experience. Modern CDN architectures connect their PoPs with high-speed private fiber to bypass internet congestion and ensure quality delivery. Peering agreements with all of the major ISPs and last-mile providers ensure the fastest performance to the largest number of end users. Origin shielding can improve performance; reduce the load on origin servers, and lower bandwidth costs by intelligently accessing cached content in multiple PoPs. Origin storage performance also becomes a critical factor in quality, with multi-region replication dramatically improving quality across geographies.

With an effective CDN, web pages respond and load more quickly. Videos start playing sooner, rarely if ever rebuffer, and sustain higher quality. File downloads are much faster and more reliable.

TECHNICAL CHALLENGES

- Ensuring highest core performance (connectivity and cache efficiency)
- Optimizing performance on cache miss (origin solutions)
- Maximizing performance in the last mile (ISP peering)

BUSINESS CHALLENGES

- Risk of audience churn due to poor user experience

The Limelight Solution

Limelight’s private backbone and dense architecture ensures quality with the fastest connectivity and highest cache efficiency. Limelight Origin Storage is tightly integrated with the delivery infrastructure and offers multi-region replication for fast retrieval and transit to users worldwide. Origin shield protects the origin while enhancing performance. To sustain quality globally in the last mile, Limelight has peering agreements with over 900 ISPs worldwide.

CEBU PACIFIC
Ensure a flawless website-booking experience

CHALLENGE

Cebu Pacific is the largest low-cost airline in the Philippines. With 60 to 80 percent of its passengers booking tickets online, CEB needed a fast, secure and reliable online booking experience while keeping up with increased traffic as the business grows globally. Since the vast majority of customers book their tickets online, any problem with accessibility of the booking site would affect customer experience.

SOLUTION

Cebu Pacific implemented Limelight CDN to improve customer experience and reliability. Website performance has improved 30 percent in East Asia and 17 percent globally. Customers can easily book and manage flights on the go, on any device. Online booking is faster and more reliable, which significantly reduced customer complaints.

“CEB aims to provide an innovative service and high-quality travel experience to our passengers. Hence, we are continuously looking for ways to increase our website performance, and we can achieve this by partnering with Limelight Networks.”

Vice President for Corporate Affairs of Cebu Pacific

Read the Cebu Pacific case study.
CHALLENGE #3: DELIVERY TO ANY DEVICE

55% of people say they expect equally fast load times regardless of the internet connected device they use. However, different devices require different formats, and access bandwidth can limit content bitrate. To reach the largest possible audience, you need to make your content available on every device.

Video is a great example. Suppose two consumers are watching the same video, one on a smart TV connected via high-speed internet access, the other on a smartphone connected to a wireless network. The network must deliver two different formats based on screen size, supported formats, and available access bandwidth. Since this optimization needs to be transparent to the user, the network must first detect the device and bandwidth, choose the best format, then retrieve or create that format and deliver it—all automatically.

HOW A CDN HELPS

There are multiple ways a CDN can help deliver content to any device on a user-by-user, session-by-session basis. The first step is to detect the type of device and the network access speed of the session. Once this information is known, the CDN can optimize the media format and data rate for the user.

TECHNICAL CHALLENGES

- For each session, detect device type, network access speed, language settings and other attributes
- For each session, optimize content format, data rate, language and other attributes on the fly
- Ensure sufficient capacity to perform at scale

BUSINESS CHALLENGES

- Making content available on any device a consumer is using
- Providing the optimal user experience regardless of the device being used
- Ensuring customer satisfaction for a range of user devices and access speeds

The Limelight Solution

Limelight provides end-user device identification with configurable actions to optimize content for the device. Customize web content or video format by device on the fly to deliver the optimal experience.

ARSENAL FOOTBALL CLUB

Handle traffic spikes from a range of devices

CHALLENGE

Arsenal.com receives millions of page views per day from among 100 million fans, with spikes of up to 250,000 unique visitors within a small window of time, often without warning. They were challenged with how to improve performance and quality of experience through any internet-connected device for its large and growing fan base.

SOLUTION

Mobile devices are the biggest source of traffic to Arsenal.com, especially in markets outside of the UK and the rest of Europe. By moving to Limelight’s CDN, Arsenal.com is now highly scalable and able to meet rapid spikes in global traffic with a robust mobile solution that can support its mobile users, wherever they are and on any device. Limelight is uniquely capable of delivering a high-quality experience any time fans request to view streaming video, read static content, or look up game results. In addition, early on Limelight’s knowledgeable technical implementation team participated in weekly calls directly with the Arsenal team to build a comprehensive plan that resulted in a painless transition.

“When the decision was made to move from our previous CDN partner of 9 years to Limelight, it went so smoothly that we experienced not even a ripple. If the switch hadn’t gone as smoothly as it did, I probably wouldn’t have the level of trust I have today within the club.”

Operations Manager for Arsenal Football Club

Read the Arsenal Football Club case study.
CHALLENGE #4: GEOGRAPHICAL REACH

In terms of geography, different companies’ market areas can vary widely. A company that serves a local region has different requirements than one that needs to reach markets across a continent or globally.

The wider the market reach, the larger the challenges. Quality of experience declines with the distance the content must travel. If parts of your audience are halfway around the world from your content, they may have an unsatisfactory experience. Network conditions and the need to traverse multiple networks can also wreak havoc, even if the distances are moderate.

Regulatory issues can also complicate global reach. China, for example, can offer vast opportunities, but additional licenses are required to deliver content from within the country.

HOW A CDN HELPS

A global CDN that has invested in worldwide infrastructure has multiple avenues to solve these geographical challenges. High-performance PoPs within the target region are critical to sustaining high-quality content egress during peak demand. High-speed connectivity between PoPs, especially dedicated fiber that bypasses public internet congestion, ensures high-quality delivery over longer distances. Direct peering access to last-mile ISPs in the targeted regions speeds up the last-mile delivery. Origin storage replicated within major regions accelerates delivery on cache miss in every region. In addition, a CDN that has partnerships in China can help you pursue new growth opportunities.

TECHNICAL CHALLENGES

- Adequate delivery capacity in regions close to website visitors
- High-performance inter-region connectivity
- Integration with last-mile providers in all targeted regions
- Acceptable performance on cache miss (origin solutions)

BUSINESS CHALLENGES

- Securing high-performance digital delivery access to all targeted geographies
- Meeting regulatory requirements that vary by country

The Limelight Solution

Limelight’s densely architected global infrastructure features data centers clustered around major metropolitan areas worldwide, interconnected by a high-speed private network, and directly connected with major ISPs and last-mile networks worldwide.

NAPSTER

Scale globally to expand and meet increasing customer demand

CHALLENGE

As Napster increases its subscriber base and expands into more regions around the world, they need to ensure a high-quality listening experience everywhere. Achieving the twin goals of expanding while ensuring quality presents unique challenges.

SOLUTION

Through the Limelight Orchestrate Content Delivery and Origin Storage services, Napster is able to consistently deliver millions of songs to customers in milliseconds across a wide variety of connected devices anywhere in the world. By utilizing both Orchestrate Content Delivery and Origin Storage Services, Napster can place its vast library of more than 40 million songs closer to the end-user, resulting in improved speed of delivery globally and a high-quality listening experience.

“The team at Limelight has genuine interest in helping Napster enhance its service, and is willing to work with us on innovative solutions. They are easy to work with and very responsive.”

Senior Director, Vendor Relationship Management, Napster

Read the Napster case study.
CHALLENGE #5: INTERNAL RESOURCE CONSTRAINTS

Access to talent is one of the top issues standing in the way of CIOs achieving their objectives. There simply never seem to be enough person-hours or people with the right skills, and the backlog always seems to be growing. Meanwhile, high-priority projects can’t wait.

Successfully managing this terrain is often a matter of focusing in-house talent to deliver the highest-value results and partnering for the rest.

For some organizations with expertise in digital delivery, it may make sense to deploy in-house talent to develop and customize CDN services. Most CDNs offer APIs for developing customized solutions. However, the learning curve can be long, and testing and maintenance of in-house solutions create ongoing demands on internal resources. When problems arise, debugging and maintaining the solution consumes even more time. The burdens become larger over time as configurations and deployments become more complex and scale increases. Finally, the opportunity cost is a factor to consider; the resources invested in CDN deployment and maintenance cannot be utilized on other projects that may have a higher return on investment for the organization.

HOW A CDN HELPS

For most organizations, utilizing the services of an established content delivery platform can provide much faster time-to-market. With the benefit of the vendor’s experience and resources dedicated to supporting and further developing the CDN platform, the solution is more likely to be trouble-free. Professional Services resources from the CDN vendor can help customize a solution to better address a customer’s specific needs. A full-service CDN can provide origin storage, security, video platform and other services to flesh out the solution and free up in-house resources for higher priority projects.

TECHNICAL CHALLENGES

• Skills required to architect, develop, integrate, test, and deploy internally developed systems
• Incident resolution
• Ongoing maintenance and support of internally-developed systems

BUSINESS CHALLENGES

• Project prioritization
• Skills assessment and resourcing
• Opportunity cost

The Limelight Solution

Limelight has experts available to act as an extension of your team. Solutions and Service Architects and engineers can support activation, configuration, data migration, workflow consultation, event support and training. In addition, if issues arise, skilled support is available 24/7/365 for prompt resolution.

CHALLENGE

After being a featured app in the Apple App Store, CoachGuitar traffic rose sharply and quickly exceeded 3 million downloads. Their typical traffic of 2,000-3,000 downloads per day surpassed 40,000 downloads per day. They needed to be able to scale to meet this demand without customers experiencing a delay in the video lessons.

SOLUTION

CoachGuitar deployed Limelight Content Delivery Services and Origin Storage to provide the scale, global reach, and high performance needed to enter new markets and gain new customers. Beyond just helping them meet their immediate goals, CoachGuitar was looking for a company that could support them in the long term as they expand their offerings. As a growing company, they wanted an established partner who is open to exchanging ideas and offering advice.

“We are happy to position Limelight as a valued partner when speaking with our customers. Limelight takes the worry out of delivering the best experience possible to our audience. We have more customers and happier customers because of Limelight.”

Chief Product Officer at CoachGuitar
EXPLORE FURTHER

We hope this article has given you some ideas for how to improve your connection for your online audience. At Limelight, we are here to help you strengthen those connections and grow your business. We invite you to get in touch!

- Visit the Content Delivery Services web page
- Visit the Resources library
- Visit the Limelight website
- Chat with Limelight
- Request a free trial

ABOUT THE ORCHESTRATE PLATFORM

The Limelight Orchestrate Platform is built upon a global, private backbone network with the speed, capacity, and availability to deliver the experiences today’s audiences demand. This industry-leading Platform includes integrated content delivery, web acceleration, origin storage, video management, cloud security, and support services. The unique combination of global private infrastructure, advanced software, and expert services surpasses other CDNs, to enable today’s and tomorrow’s workflows and put audience experience first.

ABOUT LIMELIGHT NETWORKS

Limelight Networks (NASDAQ: LLNW), a global leader in digital content delivery, empowers customers to better engage online audiences by enabling them to securely manage and globally deliver digital content, on virtually any device. For more information visit our website at https://www.limelight.com.

1 Cisco Visual Network Index, 2018
2 The State of Online Video 2018, Limelight Networks
3 Cisco Visual Network Index, 2018
4 The State of the User Experience 2017, Limelight Networks
5 The State of the User Experience 2017, Limelight Networks