Lumen Solutions for Media & Entertainment

Technology leaders: rise above a crowded content space with a comprehensive, flexible and scalable approach to media distribution.

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Getting an edge in global media distribution

The media landscape looks vastly different than it did only five years ago. "Media" is no longer solely the realm of production studios and television stations. Social networks, gaming sites, and user-generated content platforms are media companies. Internet service providers and technology giants are also foraying into the music and video space. E-learning services, faith groups, local newspapers and even fitness companies now use video more than ever to reach wider audiences.

At the same time, consumers' idea of media has drastically changed. In a recent Lumen survey, nearly 90% of European consumers considered "television" as any video they watched on their devices. 65% of them already subscribed to two or more streaming services.

As video and technology merge, the face of media is changing; development teams are agile, software and cloud computing have replaced hardware-based workflows, and black-box technologies have fallen out of favor. Media companies need solutions that are adapted to new challenges and new ways of working.

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The Lumen approach

Lumen can help to meet the scale, flexibility and reliability imperatives of a new generation of media companies. Our multifaceted solutions are focused on bringing media businesses optimal performance from the network core out to the farthest edge.

With one of the largest wholly owned fibre IP networks in the world, Lumen is well positioned to provide the capacity needed to support the massive growth of online video. Consistently ranked the best-connected global network, Lumen possesses great advantages in helping to manage and deliver our customers' content.

In addition to the strength and scale of our global network, Lumen brings innovative capabilities that help businesses deliver better user experiences and gain an edge in a crowded content space. Network is no longer about moving bits from point A to point B. Modern content distribution must combine a global network footprint with cutting-edge software capabilities.

Lumen aims to deliver these advantages in a customer success approach that measures the outcomes that matter most – end user experiences. Our customer success teams operate as an extension of our customers' DevOps and site reliability engineering (SRE) teams, using data to identify opportunities for improvement and helping to enable our customers to exceed performance objectives.

Lumen has over 30 years of experience in broadcast media and serves nine of the world's 10 largest media companies. Our solutions span the entire media workflow, from video acquisition, to transformation, enrichment, origin, caching, security, and optimisation. Discover the Lumen offerings that have helped broadcasters delight audiences in-region and worldwide.

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Acquisition

The Lumen Vyvx® line of fibre, IP atrconnection solutions

Full-time television distribution services were traditionally dominated by satellite, which were prone to compression, latency and operational overhead, along with limited scalability. Multichannel video distributors seek to reduce costs, and over-the-top video providers have created a new market for the delivery of 24/7 channels. These businesses require scalable solutions that minimise infrastructure investment and operational complexity as IP workflows increasingly become the norm.

Managed Fibre

For broadcasters that need to transform camera footage to digital assets for OTT distribution, Vyvx® Broadcast Solutions offer a comprehensive portfolio of managed transport services, including content acquisition, contribution, and distribution across our dedicated global fibre network.

Lumen consistently ranks as the best-connected network in the world, with over 300 Tbps of global egress capacity and 8,500 unique Autonomous System (AS) interconnects. Lumen provides connectivity in over 60 countries with 450,000+ route miles globally and extensive off-net access solutions across North America, Europe, Latin America and Asia Pacific. With the global coverage provided by our points of presence and on-net marketplace, high-quality SDI, MPLS and satellite feeds can be reliably and securely replicated and delivered to multiple end points across our network.

From over-the-top (OTT) to channel distribution, Lumen brings 30+ years of video experience, connecting hundreds of professional and college sports venues, multiple broadcaster and studio locations, and the major cloud platforms. Vyvx has supported thousands of major sporting and entertainment events, including the Super Bowl, Academy Awards, and the World Cup.

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Interconnectivity

Lumen Vyvx® Cloud Connect leverages our tier-1 backbone and managed service provider relationships to provide direct, secure fibre connectivity into major cloud providers including Google Cloud, AWS, and Microsoft Azure. Bring your video feeds directly and cost effectively from the Vyvx network into your cloud environment and on to your chosen transformation and origin solutions.

Internet Transport

For companies that prefer to transport certain video content over the public internet instead of leveraging managed fibre, Lumen is aiming to expand the Vyvx® product line to include media transport over IP. Targeted towards late 2021, the expanded product offering is scheduled to include support for point-to-point video delivery, as well as the ability to view service health and status of active transmissions including packet loss, recovered packets, round-trip time, retransmits, and signal presence.

- Over 300 Tbps of global egress capacity from an extensive fibre backbone, strong peering relationships and a global server infrastructure
- 450,000 miles of route fibre across the globe
- 1.6 billion dedicated broadcast service minutes in 2019
- More than 12,138 live sports reservations annually

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Transformation

Lumen Media Transformation for content encoding and enrichment*

As online video workflows become increasingly complex, gaps between vendors along the value chain have grown. Consolidating video transformation and enrichment into a single, lightweight component can present a significant advantage when it comes to time, resources and operating expenses.

Lumen Media Transformation brings a rich set of encoding, transcoding, and enrichment capabilities for the delivery of live, linear, and on-demand content over the internet. In addition to output in all major ABR streaming codecs and formats, content enrichment capabilities include dynamic ad insertion, closed-captioning, digital rights management, time shifting, geo-filtering and loudness control.

This cloud-based solution has been designed for flexibility. Broadcasters seeking a fully managed service can use the various Lumen Vyvx and CDN solutions together for a turnkey solution able to transform broadcast signals into ready-to-serve content. Those looking to pick and choose technologies may integrate Lumen Media Transformation directly into their existing workflow, turning the service on and off as need be.

- Encoding to all major OTT streaming formats, alongside DRM, advertising and closed captioning

- Time-to-market gains with flexible cloud infrastructure, an easy-to-use interface and flexible provisioning

- Streamlined operating expenses with a fully IP- and cloud-based workflow

- Direct links with the Vyvx® acquisition solutions and the Lumen Content Delivery network, for an end-to-end managed workflow

*Coming H2 2021.

Origin

Lumen Cloud Object Storage

Lumen's object storage platform combines the advantages of an object-based architecture with in-region storage for lightning-fast time to first byte as well as direct connectivity to the CenturyLink IP network for high-speed egress to the Lumen content delivery network. Redundancy across three storage arrays helps ensure content availability, while user token authorisation and encryption also help to ensure that your data is secure whether at rest or in motion.

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Delivery

Lumen Content Delivery network

Modern consumers are more spoiled than ever for choice, making quality content delivery the cornerstone of a successful audience experience. As both a CDN and tier-1 provider, Lumen is positioned to leverage its global physical network for direct connectivity into other ISPs and cloud providers.

Lumen's global Content Delivery Network features a massive 170 Tbps of worldwide server capacity through points of presence located in over 40 countries and 90 major metropolitan areas. Servers have been strategically deployed to leverage peering relationships and minimise operational complexity. As our CDN is architected directly into the company's IP backbone, Lumen can help reduce complexity in serving paths and reliance on third-party infrastructure for higher performance and lower latency.

The Lumen CDN features software-defined networking capabilities, automated network healing, and optimisation of how data is routed through the core. Tailored solutions for companies with strategic market plans are also available.

Lumen has a track record of rapidly expanding its network in strategic locations as we anticipate the growth ambitions of our customers. Our delivery capacity doubled over the last year, while traffic in critical markets like APAC and LATAM grew more than 300%.

- Massive global scale architected directly into the Lumen tier-one IP backbone

- 170 Tbps of total CDN server capacity from POPs strategically placed in 94 major metropolitan areas in 42 countries

- 40% growth in peak traffic year on year, with 55 Tbps delivered on peak in 2020

- Two-thirds of POPs outside North America, a truly global network

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Delivery Optimisation

CDN Mesh Delivery

Flexibility is critical for broadcasters operating in an increasingly unpredictable delivery environment. To help enable elastic scale whenever and wherever they need it, Lumen offers peer-to-peer distribution technology as a natural extension of its global CDN network.
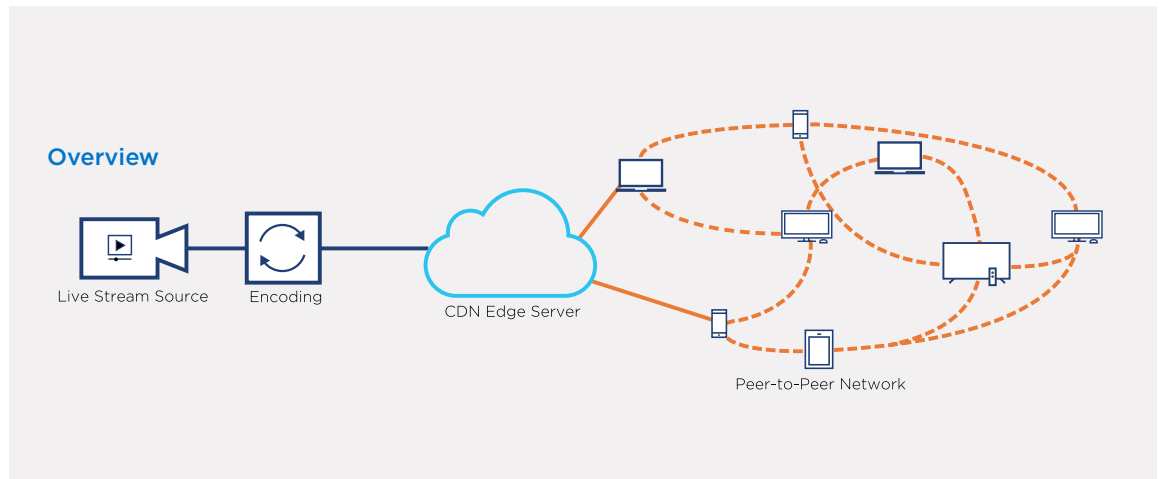
CDN Mesh Delivery intelligently routes traffic from a virtualised mesh network of client sources as well as CDNs. Optimising the distribution of video content all the way to the device, live and on-demand video broadcasters can leverage this technology to improve performance, enhance reliability, and expand their reach beyond a server-based architecture.

- **Manage peak traffic and unexpected spikes:** CDN Mesh Delivery offers elastic scale, growing as more users tune in. This elasticity helps manage spikes – even unplanned – and minimises the need to precisely predict traffic volumes to adequately provision capacity.
- **Access underserved markets without increasing infrastructure:** Mesh architectures keep content far out at the edge of the network. Since CDN Mesh Delivery leverages the devices watching the content in addition to the CDN, proximity to the server is less critical to round-trip time. Keeping traffic within individual ISPs reduces reliance on both the CDN and ISP peering.
- **Improve end-user experiences:** CDN Mesh Delivery customises video delivery to each viewer, leveraging device telemetry to dynamically decide the best source for the next video segment. The technology makes more segments available closer to the edge of the network, helping to reduce rebuffering and promote higher average bitrates for users.

- Up to 15x the delivery capacity instantly for faster time to market

- 60 to 75% of video traffic managed by CDN Mesh Delivery

- Up to 30% less rebuffering compared to traffic delivered via CDN only

- 1.4 billion video sessions delivered by CDN Mesh Delivery in the first half of 2020

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How it works

CDN Mesh Delivery:

Overview

Live Stream Source Encoding CDN Edge Server Peer-to-Peer Network

SPOTLIGHT:
Where do Lumen's mesh capabilities come from?

Lumen strives to make the transport of data as efficient as possible, and network-aware peer-to-peer technology furthers our goal of optimising performance for end users. With the acquisition of Streamroot in 2019, Lumen armed itself with a leading peer-to-peer video delivery provider, the foundation for our global CDN Mesh Delivery platform.

Streamroot solutions are trusted by major international media companies. Its mesh architecture has been used for professional tennis, soccer, cycling and rugby championships. In 2020, CDN Mesh Delivery delivered breaking news and announcements from world leaders on a number of major European network television stations, instantly providing the scale necessary to manage unprecedented pandemic-related demand with virtually no lead time.

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Traffic Management

Lumen CDN Orchestrator, performance-based load balancing

With a multitude of options to choose from, audiences demand superior user experiences. To provide consistently high quality under nearly any condition, multi-CDN has become a best practice. Online video platforms frequently deploy several CDNs to improve overall performance, take advantage of discrepancies between providers, streamline costs, and help ensure precious redundancy.

Lumen champions multi-CDN strategies as a critical component of a modern video workflow and proactively works with other CDN providers to simplify the implementation of multi-CDN architectures.

For broadcasters that demand the highest quality for their audiences at all times, Lumen offers a state-of-the-art device-side CDN switching technology, CDN Orchestrator. Integrated directly into your video player, CDN Orchestrator uses real-time feedback from the device to choose CDNs on a segment-by-segment basis. At each segment request, CDN Orchestrator assesses whether the current CDN provides sufficient quality to the user based on the inputs of your choice. If the player experiences errors or increased latency from one CDN, it can seamlessly redirect the next segment request to a better performing CDN in real time without the user having to refresh the page.

As a CDN-agnostic solution, CDN Orchestrator can be used with any number of content delivery providers on the market. It even has the ability to offer midstream optimisation to save a video session if a CDN fails mid-session.

- Seamless midstream switching without page refresh

- Decisions based on individual user device feedback

- Entirely CDN-agnostic

- No single point of failure

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Security

DDoS mitigation

To keep up with the increasing size and sophistication of distributed denial of service (DDoS) attacks, media businesses need access to advanced detection and mitigation capabilities. Lumen DDoS Mitigation Service provides network and application layer protection across multi-vector and mixed application layer attacks to help minimise downtime and maintain performance. Our DDoS solutions are scalable, carrier-agnostic and facilitated by our massive and deeply-peered IP backbone to support end-to-end Layer 3/4 and Layer 7 protection.

An ecosystem approach to application layer security

In addition to DDoS mitigation, Lumen offers a wide-ranging ecosystem of application-layer security solutions including web application firewalls, bot managers and API protection. Available as modules that can be deployed at the edge, these security solutions offer broadcasters the flexibility to choose among best-of-breed security solutions and change as their needs evolve, all while streamlining security under a single provider.

- 140 DDoS attacks mitigated per day

- Over 75% improvement in meantime-to-detect (MTTD) and meantime-to-respond (MTTR) to DDoS attacks with Lumen solutions[3]

- +5 leading options for WAF, bot management and API protection for maximum flexibility

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Footnote
3. Forrester, The Total Economic Impact Study of Lumen DDoS Mitigation Service, April 2020.

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Application Acceleration

CDN Edge Compute

Alongside delivering high-quality and secure streams, video providers must offer rich experiences to keep viewers engaged.

Lumen CDN Edge Compute offers a flexible and controllable edge platform to help design, deploy, and optimise application performance. With full DevOps workflow integration and an extensive ecosystem of proprietary and third-party edge modules, Lumen CDN Edge Compute can allow developers to move logic closer to viewers to enhance performance, increase security, or test new configurations.
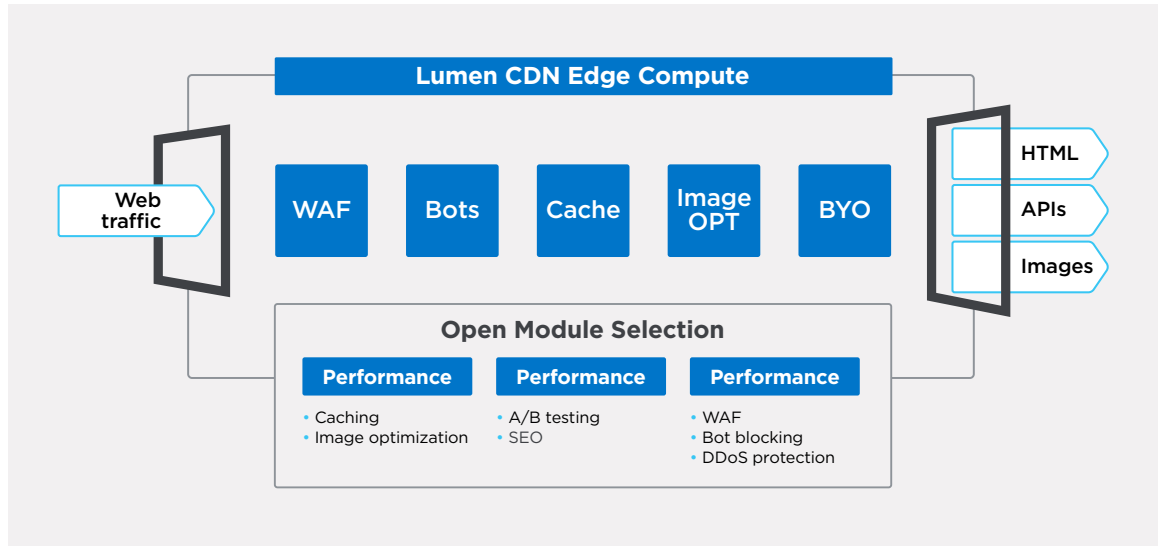
In addition to application security, common uses of edge computing in the media & entertainment space include secure login and paywall, as well as recommendation engines, content management systems, and A/B testing of features. Image optimisation and dynamic content / API caching are also available through CDN Edge Compute.

Extensible APIs help engineering teams speed up deployment cycles and automate workflows, helping them to quickly move to production at reduced risk. Engineers gain complete code-level control over edge workload configuration, testing, and global deployment.

- Industry-leading application layer security ecosystem offering web application firewalls, bot management, and API protection

- Dev/Ops native environment, CD/CI integration, Git-backed workflows

- Custom containerised workloads: supports execution of customer applications running directly on the edge platform

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How it works

Application Acceleration:

Conclusion

Media has never seen so much competitive pressure alongside so much opportunity. As video continues to dominate our use of the internet, the technologies supporting it must continue to innovate and expand to help media companies get an edge in the global content delivery space.

From content acquisition to encoding, distribution and security, Lumen's end-to-end solutions for media companies can help you deliver secure and lightning-fast experiences to your audiences, all from a single provider. Benefiting from more than 30 years of experience building technology for some of the largest global enterprises, Lumen today serves nine of the world's ten largest media companies. The company was named a Leader in the IDC MarketScape Worldwide Commercial CDN 2019 Vendor Assessment for both the scope and scale of its deeply peered global network, but also for its technology innovation.

For more information and to try our solutions on your platform, contact us at:

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