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Breaking the Bottleneck: How the Open Edge is Redefining Streaming Quality

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As the demand for live-streamed events continues to surge, most notably across the sports arena, many consumers have experienced significant quality issues. A 2024 Hub Entertainment Research US market report, What's the Score: The Evolution of Sports Media, highlights 37 percent of viewers regularly have some kind of problem (e.g., lag, buffering, crashes) when streaming sports.

Looking internationally, as recently as January 2023, sports streaming platform DAZN was called to a government meeting in Italy to explain its ongoing stream quality problems while delivering its Serie A football coverage. This resulted in DAZN offering refunds to some subscribers. Although this is an example of live streaming at a national level, these quality of experience (QoE) issues are further exacerbated when expanded to a global audience. These cause significant frustration for many viewers, providing a variable QoE that many find unacceptable, not least because of the prices they are paying.

This isn't only about primary screen viewing; far from it, in fact. Digital marketing agency Adtaxi released the results of its Super Bowl viewing survey in January 2025. It reveals "almost half of all Americans choose streaming and connected TV over cable and broadcast options and almost 70 percent of the total audience will utilize secondary media to engage with Super Bowl-related content." It adds, "The findings were clear: the Super Bowl has become a multi-platform experience, with almost 70 percent of Americans utilizing an average of 2+ additional media platforms to engage in related content."

These content delivery issues aren't only a problem for streaming platforms; they directly impact internet service providers (ISPs) whose networks become overwhelmed, unable to cope with the volatility created by huge demand spikes and therefore degrading the experience for users. With sports streaming rights increasingly moving to online platforms, the urgency to fix these bottlenecks has never been greater.

But this is the tip of the iceberg. Future demands, from the growth in AI and the required real-time compute power, to 5G content delivery and the demands of the smart cities of the future, cannot be satisfied by the internet of today.

The Evolution of Internet Infrastructure

The internet was originally designed for simple data exchange, far removed from today's high-bandwidth, real-time streaming. In its infancy, information was transmitted via centralized servers, requiring significant distances for data to travel. As the web evolved, traditional content delivery networks (CDNs) emerged to cache and distribute data closer to users. These CDNs improved efficiency but were still structured around centralised data centers, which presented scaling limitations as internet traffic grew exponentially.

CDNs have played a crucial role in enabling digital services. They reduced latency for static content such as web pages and software downloads. However, the landscape changed with the rise of streaming. Unlike cached, on-demand content, live streaming demands real-time responsiveness, making traditional CDN architecture increasingly inadequate. Taking mobile video traffic as an example, according to Ericsson's November 2024 Mobility Report, at the end of last year, video traffic was anticipated to account for 74 percent of all mobile data traffic. It is part illustration of how the existing internet structure — built around centralized nodes — has become a severe bottleneck.

Why a Centralized Model Cannot Meet Today's Streaming Needs

This structure means most content still flows through a small number of peering points before reaching end-users. This approach is ill-equipped to handle live events that require simultaneous distribution to millions — sometimes tens of millions — of viewers worldwide. Current CDNs, while effective in some use cases, are still dependent on a handful of regional hubs, leading to congestion during peak events. From a business perspective, the traditional CDN is unsustainable. Centralized infrastructure cannot scale efficiently, leading to congestion, rising operational costs and inconsistent service delivery. The time has come for ISPs and content providers to collaborate on optimizing network resources to create a long-term viable model.

This shift is already underway, which we can see through the cascade of CDN market consolidation in recent years. Major players like StackPath and Lumen exited the CDN market, Edgio has been shut down altogether, others have been acquired, and even Akamai has pivoted towards higher-margin security services to counter declining CDN profitability. These moves highlight that the legacy CDN model is unable to keep pace with modern internet demands.

The Rise of Open Caching and Industry Standardization

Developed by the Streaming Video Technology Alliance (SVTA), an organization composed of media companies, ISPs, and CDN providers, the Open Caching industry standard has been built in recognition of these challenges and designed to bring content closer to consumers. Instead of relying solely on centralized CDNs, Open Caching enables ISPs to host and distribute content from within their own networks.

The SVTA has proven pivotal in defining and refining Open Caching standards. Its core goal is to create a federated caching system that allows seamless collaboration between content publishers and ISPs. By embedding caching capabilities deeper inside networks, Open Caching minimizes congestion, reduces reliance on upstream internet exchanges, and delivers superior quality for end-users. But there's still more to come.

The NCTC and the Benefits of Open Caching for Rural ISPs

Open Caching is not just for major national networks: it's proving essential for smaller ISPs as well. The National Content & Technology Cooperative (NCTC), representing over 700 members serving more than 30 million US households, has embraced Open Caching to enhance streaming efficiency and network capacity. Many NCTC operators serve rural areas with limited backbone connectivity, making it crucial to bring content closer to subscribers.

NCTC members have significantly improved QoE, reducing backhaul strain as content is delivered from caches within their networks. This, in turn, provides huge benefits to end users, removing video quality concerns. This has drawn interest from major sports brands looking to stream directly from these local caches. For example, a viewer in rural Nebraska once relied on streams backhauled from hundreds of miles away — now, content is delivered instantly from a local cache, improving speed, reducing latency, and ensuring seamless access to major live events.

The Open Edge: Defining the Future of the Internet

The Open Edge is a groundbreaking content delivery model that transforms ISP networks into distributed content delivery platforms. Unlike traditional CDNs, which operate independently of ISPs, the Open Edge embeds caching and compute infrastructure directly inside ISP last-mile networks, enabling hyper-local content delivery.

Here's how the Open Edge model works:

1. Embedded Edge Nodes – Software-driven caches are deployed deep within ISP networks, rather than at distant exchange points.
2. Dynamic Scaling – The system intelligently adapts to traffic demand, ensuring that content is delivered efficiently and without congestion.
3. Ultra-Low Latency – By serving video and applications from the nearest edge node, buffering is virtually eliminated, creating a seamless viewing experience.

For the end user, this means instant streaming startup, no buffering, and pristine video quality, even during major live events. By decentralizing content delivery, the Open Edge drastically reduces backbone traffic and empowers ISPs to deliver broadcast-quality streaming at scale.

The Future of Open Edge: AI, 5G, and More

While the Open Edge is solving today's streaming challenges, its potential extends far beyond video. The same edge infrastructure is poised to support emerging applications such as AI-driven services, 5G-powered smart cities, and real-time analytics.

AI applications, for instance, require rapid data processing at the network edge. By utilizing this distributed architecture, AI inference models can operate with near-instantaneous response times, reducing the burden on centralized cloud systems. Similarly, 5G networks depend on ultra-low-latency data transmission, which Open Edge enables by placing compute and storage resources closer to the user.

Applications such as AR/VR, autonomous vehicles, and cloud gaming will all benefit from an Open Edge infrastructure, making it a critical component of the internet's future.

A New Era for Streaming and Beyond

The Open Edge represents a fundamental transformation in content delivery. By decentralizing streaming infrastructure and embedding caching capabilities directly within ISP networks, this model overcomes the limitations of traditional CDNs and ensures that consumers receive the best possible digital experience.

As streaming continues to dominate internet traffic, and as new technologies such as AI and 5G redefine connectivity, the Open Edge will serve as the foundation for a faster, more scalable, and more efficient internet. With major ISPs already on board and Open Caching setting the industry standard, the future of digital content delivery has never looked brighter.