



OTT AT SCALE

Why Large OTT Operators Need Private CDNs

The Demand for OTT content continues to stretch the capabilities of public CDN architectures. OTT Operators see ever-increasing costs for CDN services that are still built on the traditional per-GB-of-output model. Private CDNs, used by large-scale streaming video operators, resolve these two issues to create an economically scalable platform for the long-term future of today's growing OTT Operators.

For over two decades, Vecima has built private CDNs for the largest streaming video operators. Vecima, formerly known as Concurrent, pioneered CDN and VOD solutions in the early 2000s, and continues to set the standard for CDN solutions.



Today's media landscape has many fast-growing OTT Operators. The largest, including Netflix, Amazon, YouTube and Facebook have used a Private CDN model for many years for obvious business reasons:

- **Improved Quality of Experience (QoE)**
Assuring revenue through close partnerships with the internet service providers (ISPs) who transport the content to consumers
- **Service Consistency and Data control**
Assuring revenue and controlling cost by closely managing their own CDN and avoiding public CDN congestion issues
- **Economies of Scale**
Cost reduction and cost predictability by building capacity, rather than renting it, for consistently high-throughput OTT services

National Broadcasters are becoming At-Scale OTT Operators

The next wave of large OTT Operators includes a different breed: the household-name national broadcasters and fast-growing sports-focused media businesses streaming direct to consumer. These businesses have reached the scale where their needs match the largest OTT Operators.

For national broadcasters specifically, the growth of OTT has three drivers. Audiences are migrating to OTT for convenience and a preferred viewing experience. Governments are re-licensing broadcast frequency for new national security and networking requirements. And over-the-air networks are increasing in cost relative to their audience value. The writing is on the wall – OTT is the future.

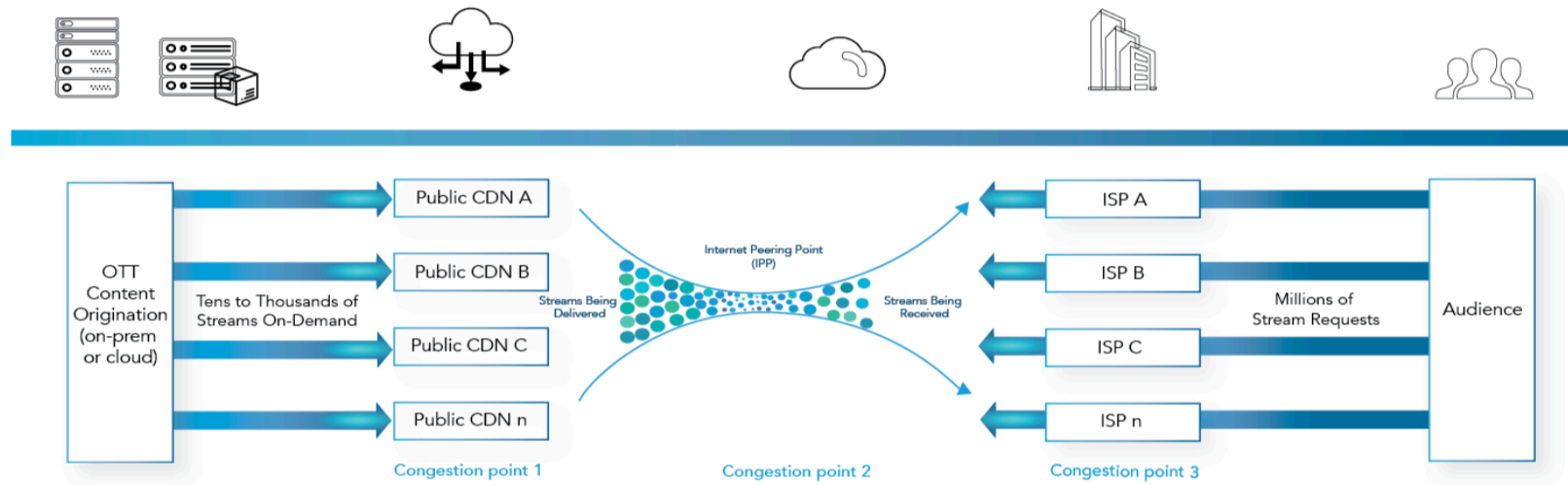
Private CDNs provide an economically scalable platform for the long-term future of large and growing OTT Operators.

What The Biggest OTT Operators Do

It's a fact that networks get congested. How to avoid network bottlenecks has been a key business topic for decades across all industries, especially those relying on transportation. The transport of video data is one of those industries.

The internet is a complex transportation network. Content Delivery Networks (CDNs) provide a managed path for content through this complex web. But today's public CDNs hit bottlenecks because of how the internet and managed broadband networks are built and interconnect. As OTT video traffic has grown exponentially, OTT Operators have found themselves caught by this problem.

CDNs - What's the Problem?



1 Congestion Point 1 Shared servers in the public CDN infrastructure process streaming video, website downloads, online games, and software updates. They can become overloaded by unexpected demand which forces content to queue or be reduced in quality.

2 Congestion Point 2 Internet Peering Points (IPP) serve a many-to-many function between content originators and content distributors. IPP capacity has to accommodate OTT demand, with investment by all parties - mainly CDN Service Providers and ISPs.

3 Congestion Point 3 The Internet Service Providers (ISP) core networks are flooded with unmanaged content. If it is not cached in the ISP then content requests continue to pass through the IPP for new unicast streams from the public CDN.

Traditional CDN economics can be improved for At-Scale OTT Operators

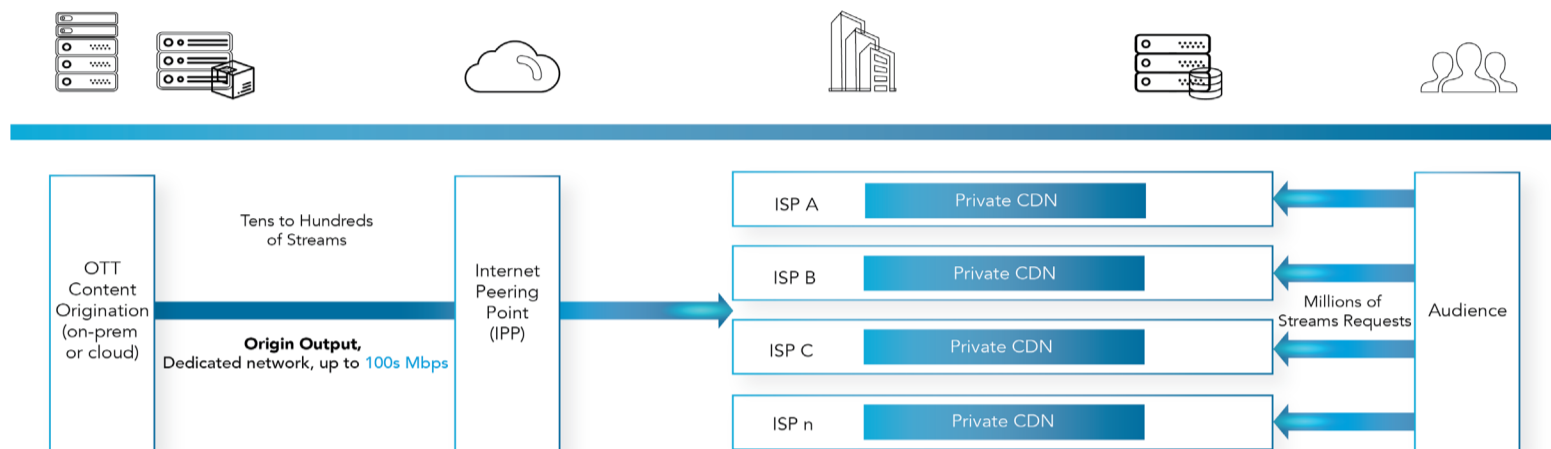
Content delivered by the CDN to the IPP is normally billed on a Per-GB-Delivered basis. This makes sense when audiences are infrequent and the OTT business model is developing.

As audiences become more frequent and the traffic becomes more predictable, the business case for a Private CDN makes more sense. Deploying CDN streaming capacity, defined in "Gbps of Streaming Capacity" means that it can be used every time without incurring incremental "GBs delivered" costs.

With a Private CDN, not only can CDN pricing be improved but so can the commercial relationship between the OTT Operator and their ISP partners. A Private CDN can be deployed inside ISP Networks for a win-win relationship. It's why the largest OTT Operators have done it already.

The Largest OTT Operators decided it was in their interest to architect their CDNs differently. They removed bottlenecks, gained more control and built key B2B relationships all at the same time.

The Future of OTT delivery - the Private CDN



The audience, Origin, and IPP are doing the same as before and the same ISPs are involved in transporting content to their consumer customers. But now there is a Private CDN in each ISP's network.

The Private CDN is essentially a set of load-balanced edge caches, connected to the Origin/IPP and the audience's devices, that ingests individual live streams and files and proliferates them onwards to thousands of end devices.

The proliferation of the unicast streams by the edge caches produces a similar result to multicasting - it reduces upstream data requests and subsequent network load by serving a request for content from a nearby location. Using this unicast proliferation model has multiple advantages over multicasting unmanaged OTT traffic over an entire ISP network - primarily, it is simpler to deploy and manage and more cost-effective.

The business benefit of consistent CDN deployment

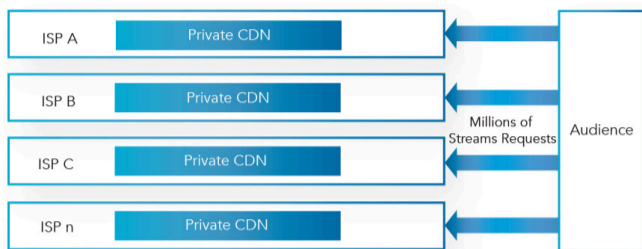
Private CDNs introduce another business benefit: simplification (i.e. cost reduction) from consistent technology deployment with unified pricing. OTT ecosystems already contain significant and effectively uncontrollable complexity from the myriad of different consumer device types and different ISP transport networks.

OTT Operators that deploy standard CDN technology across their ISP partners remove an unnecessary variable from their delivery platforms, deliver consistent service experiences to their audience, and achieve procurement economies of scale.

The largest OTT Operators achieve business differentiation through their CDN platforms. This differentiation is at the heart of their revenue assurance and cost control.

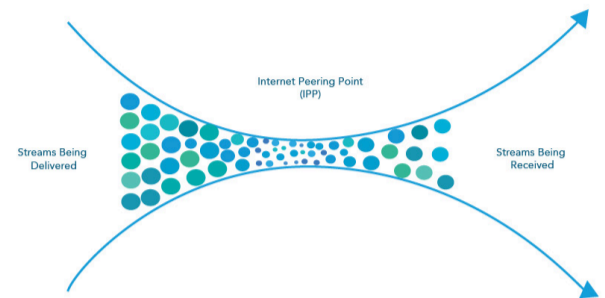
Improved Quality Of Experience (QoE)

QoE is a critical differentiator in a competitive OTT market. QoE requires world-class management of the video transport. Private CDNs are world-class platforms that literally provide an edge over the competition.



Private CDN

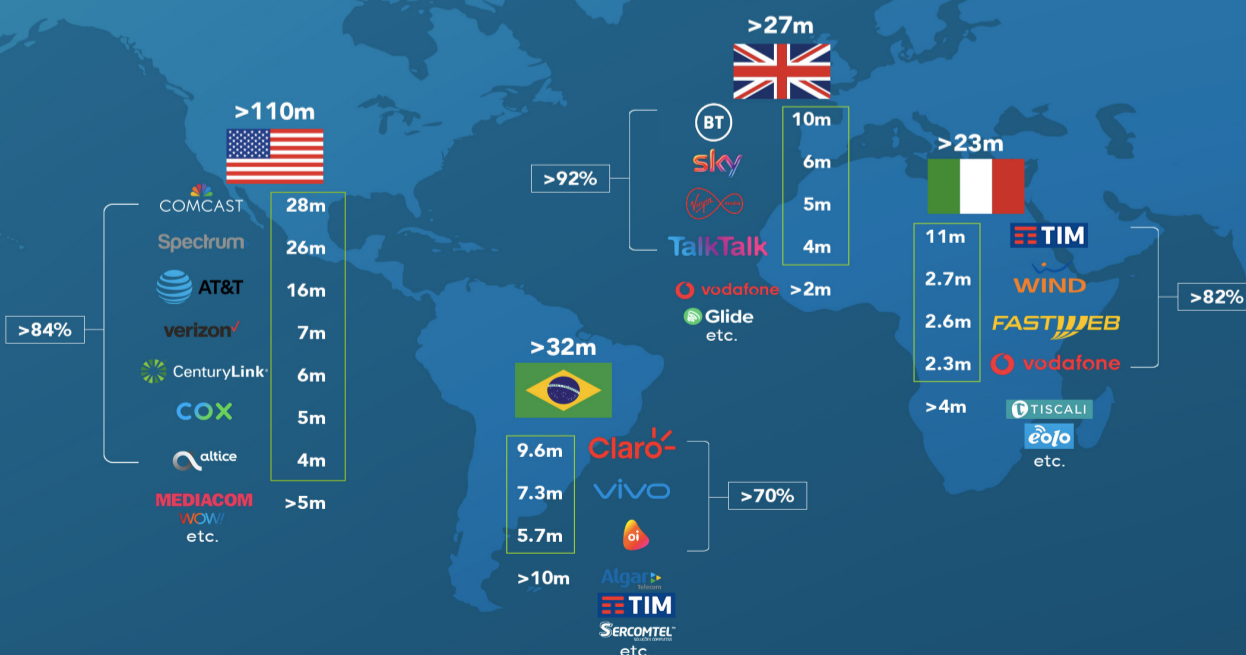
The Private CDN serves all end consumer requests for content. So after the first request is served, the Private CDN inside the ISP will serve the second, third and all subsequent requests to consumers on the same ISP network. For Live content where latency matters, this avoids the latency-inducing journey to fetch content through the IPP to the public CDN and Origin. For VOD content, this avoids the extra time and cost required to stream the same file through the IPP.



Internet Peering Point

In the Private CDN model, for major live events the IPP is no longer a performance bottleneck as the stream size reduces from Terabits per second to a low number of Gigabits per second. This passes easily through the IPP, without congestion or a dependency on the IPP operator to expand bandwidth. The real consumer-facing workload passes on to the new Private CDN layer. This 1000x reduction in IPP load also creates an important opportunity for the ISP to reduce their IPP capacity and associated cost while maintaining performance.

Most countries have between 3-6 ISPs that reach over 80% of consumers.



A Private CDN model makes the relationship with this small group of ISPs a deeper partnership, rather than the OTT Operator just being one of many content originators streaming their content through the IPP. This partnership is essential to the large OTT Operators, whose viewers are shared with the ISPs' subscribers.

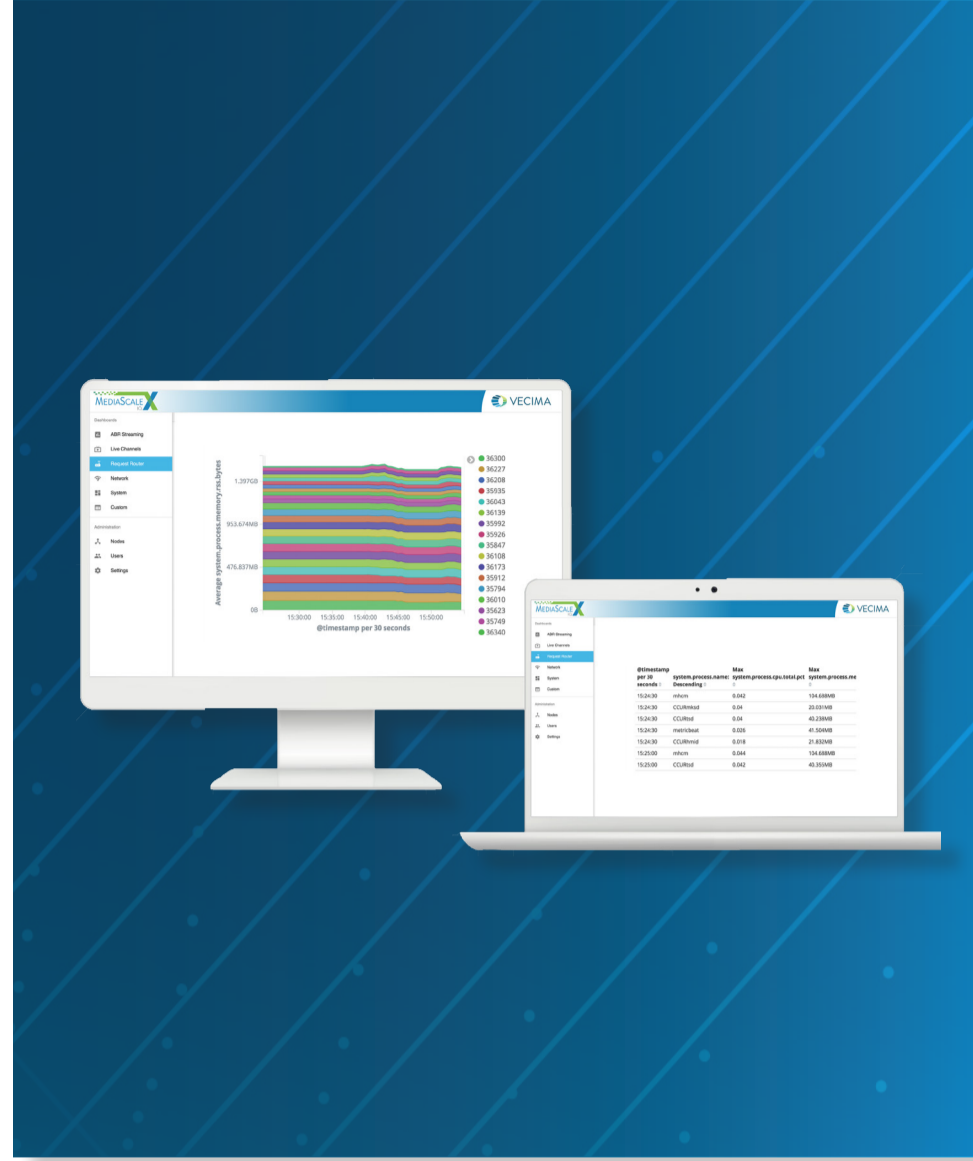
With smaller ISPs that collectively serve less than 20% of the market, unless the OTT Operator can justify a Private CDN inside the ISP's network, then a good option is to deploy a Private CDN on the Origin side of the IPP to achieve at least some of the performance benefits from using a private, dedicated platform.

Service Consistency and Data Control

OTT revenue assurance relies on both quality of content and quality of experience (QoE).

A Private CDN enables a higher level of service consistency, a foundation-stone of QoE. It also provides deep insight to the CDN ecosystem, enabling in-depth quality of service data analytics and proactive service management.

Consistency and control are delivered in three specific ways:



The Private CDN, by definition, is not shared with other OTT Operators. The processors and storage in the Private CDN can be optimally utilized only for the individual OTT Operator. This avoids being surprised by unexpected traffic from other large OTT Operators.

A standard Private CDN deployed across multiple ISPs creates the simplest, most consistently performing platform. This makes a difference for live events, where the integration between Origin, CDN and Players/Clients is essential. A large OTT Operator, delivering live events to large audiences on a carrier-grade Private CDN platform deployed throughout multiple ISPs will deliver the best possible service to its viewing customers.

Performance data from the Private CDN are only for the OTT Operator. This enables extremely deep and valuable Quality of Experience analytics. It also enables proactive monitoring and preventative action on the CDN platform itself. Correlating this in-depth CDN data with device-side data allows an OTT Operator to understand exactly how their content is being delivered and how their end customers are experiencing their content.

PRIVATE CDN

Netflix, Amazon, and others built Private CDNs to give them a fundamental business advantage through consistent service to their customers and direct control of their data.

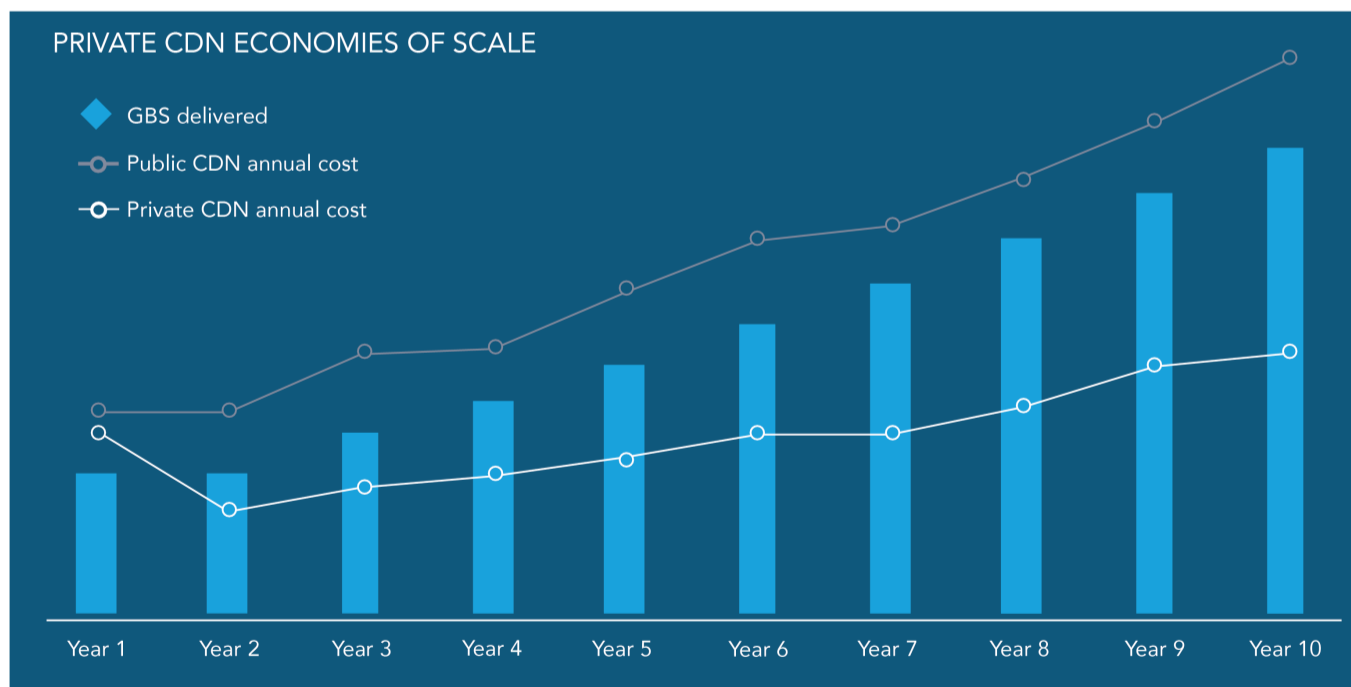
A Private CDN is attractive for its performance and revenue assurance benefits. But the largest OTT Operators know they must deliver significant economies of scale as audiences, video traffic and the competition all grow.

Economic Flexibility and Scale

The Private CDN model is oriented towards paying for throughput (i.e. Gbps of streaming capacity) rather than paying for output (i.e. GBs of content delivered). This fundamental difference changes CDN economics for OTT Operators. In a pay-per-GB model, the audience watching for 2 hours instead of 1 hour doubles the cost. This doesn't affect the cost in a pay-per-Gbps model because the capacity is already in place for the OTT Operator.


Because a Private CDN is deployed as private capacity, it can either be a customer owned-and-operated platform or it can be run as a private managed service. This creates the option for capex and opex models, which appeal in different ways to different businesses. Managed Private CDNs are most popular at the moment for many OTT Operators who are making the move away from public CDNs, while the largest OTT Operators who have built the largest regular audiences on their platforms can capitalize their investment for maximum leverage over the long term.


The general comparison between a Private CDN priced on Gbps of capacity vs. a Public CDN priced on GBs of output is shown in the chart. Economies of scale for large, frequently used OTT services are achieved with the Private CDN platform.




The Private CDN Financial Analysis can be calculated quickly. It starts with modelling the OTT Operator's traffic patterns, leading to sizing the CDN capacity needed for delivering VOD and Live content. This shows how efficient the Private CDN model can be and is usually a real eye-opener for customers!



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