

Synamedia

Why next-generation
video experiences
start with your video
network



Contents

The backbone of Infinite Entertainment	3
Bringing immersive experiences to every screen	5
Last mile scalability for live content	8
Cloud and virtualization	11
Security	13

The backbone of Infinite Entertainment

Video is in flux for everybody. Digital disruption is creating new risks and opportunities at every turn.

On one side, viewers are less loyal and more transient:

Audiences around the world are variously cutting the Pay TV cord, hopping between a hyper-abundance of new OTT subscriptions or turning to video games, social media and YouTube for entertainment.

On the other, their appetite for spectacular video experiences is stronger than ever:

3.5 billion people watched the 2018 FIFA World Cup and the world's biggest companies are spending billions of dollars bringing cinema-quality programming to the living room.

The market isn't in freefall—it's in free ascent. There's a huge opportunity for broadcasters, service providers, content owners (and everyone in between) to innovate, differentiate and bring incredible experiences to new audiences anywhere in the world.

But here's the really important part...

There's more to incredible experiences than content

You need that content to look and sound great on every device.

You need to wrap it in a seamless, personalized experience.

You need to support it with a scalable, efficient, secure and future-proof technology foundation.

And you need to optimize all your video network functions to help control costs, simplify management and drive business agility everywhere.

In the world of Infinite Entertainment, your video network is the foundation of your competitive advantage.

It dictates your operational reality—the way your people work, the services you provide and your ability to make decisions and seize opportunities.

This guide is an overview of the transformation opportunities available for video networks everywhere. We'll cover some of the most exciting ways you can get your content, budget and people working as effectively as possible—so every ounce of input translates into great customer outcomes.

Let's dive in.

The backbone of Infinite Entertainment

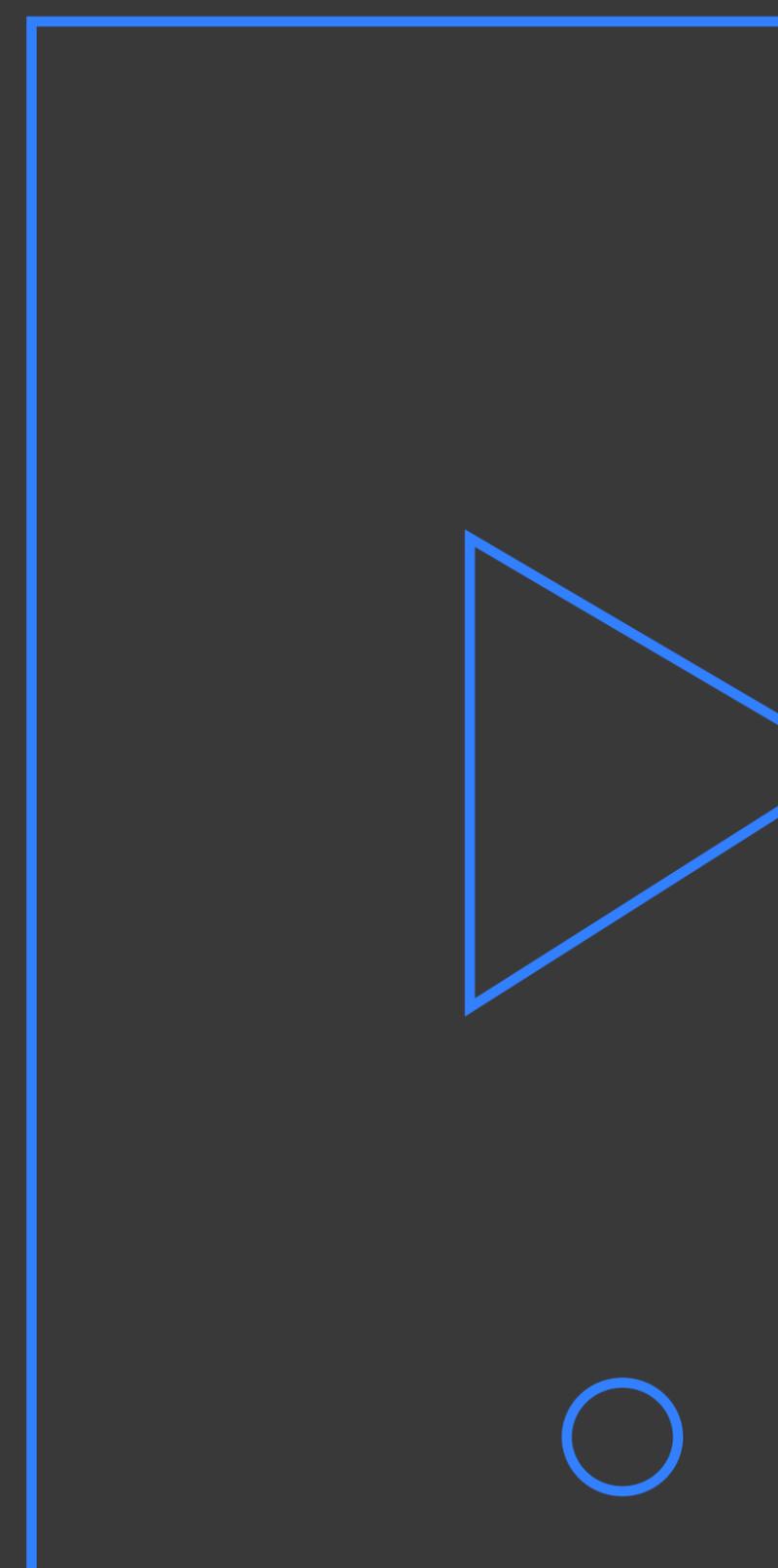


Bringing immersive experiences to every screen

The rapidly escalating quality and availability of video content across consumer devices is pushing traditional video network infrastructure to the limit.

Frontiers like live sports and big budget premium VOD are bringing truly cinematic experiences to living rooms, bedrooms and commuter trains (plus anywhere else audiences choose).

But to accommodate the new normal (of world-class, on-demand content that looks and sounds spectacular on every screen) video networks need to evolve in some crucial ways.



Picture quality

Skyrocketing picture quality is the most immediate stressor of video networks. Pushing more frames and pixels to more devices naturally demands more from the networks that carry them.

As consumers increasingly adopt 4K-ready devices (like TVs, phones, tablets, laptops and soon, VR headsets) and new broadcasting standards like ATSC 3.0 support 4K (and eventually 8K) streams over-the-air, video providers need to prepare their networks to increase capacity as efficiently as possible.

Picture quality in numbers

4K

Streams need 4X more bandwidth as 1080p (20-25Mbps)

8K

Streams have 4X the pixels of 4K, and up to 2X the frame-rate, so bandwidth leaps to 80-100Mbps.

Crucially, picture quality isn't just about more pixels, but *better* pixels. High Dynamic Range content means deeper blacks, more vivid colors, and importantly for providers, more bandwidth.

Picture quality isn't improving in isolation. There's also more content, on more channels, across more IP-connected devices than ever. Delivering heightened experiences at scale brings obvious performance requirements at a time where every cent needs to work as hard as possible.

So it's not just a matter of scaling up reach—it's also about leading on efficiency. **How can video networks reliably deliver better experiences on a bigger scale—without inflating costs or complexity?**

Bandwidth efficiency

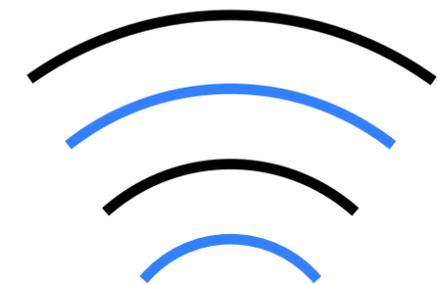
To improve quality without driving up costs, video providers need to store and transport streams as efficiently as possible—reducing overprovisioning without compromising on fidelity.

That means two things: staying up to date with the latest compression technologies and codec optimizations, and increasing bit-rate utilization, to ensure that every bit moving through your network translates to a great viewing experience.

The challenge today is that **traditional adaptive bit rate (ABR) deployments protect the viewer experience by overprovisioning.** Stream profiles are configured with a Constant Bit Rate fixed at the ceiling of what the stream demands (i.e. the most complex scenes).

That means a stream encoded with a fixed CBR of 4Mbps will fill that capacity with stuffing data throughout less complex scenes to leave headroom for the scenes that require it. But every scene is different—and most scenes require much less than the cap.

The answer is to decouple the bit rate cap from actual usage through something like Smart Rate Control—so streams can use *less* than the cap where possible. It means every bit transmitted translates to quality video on the screen. Providers see bandwidth and storage savings, and users see an *increase* in quality because bit-rate usage can burst up and down as required.



Last mile scalability for live content

Live content is the largest remaining bastion of appointment viewing. It's emotive, high-stakes viewing that viewers have a lot invested in—content quality matters most of all here.

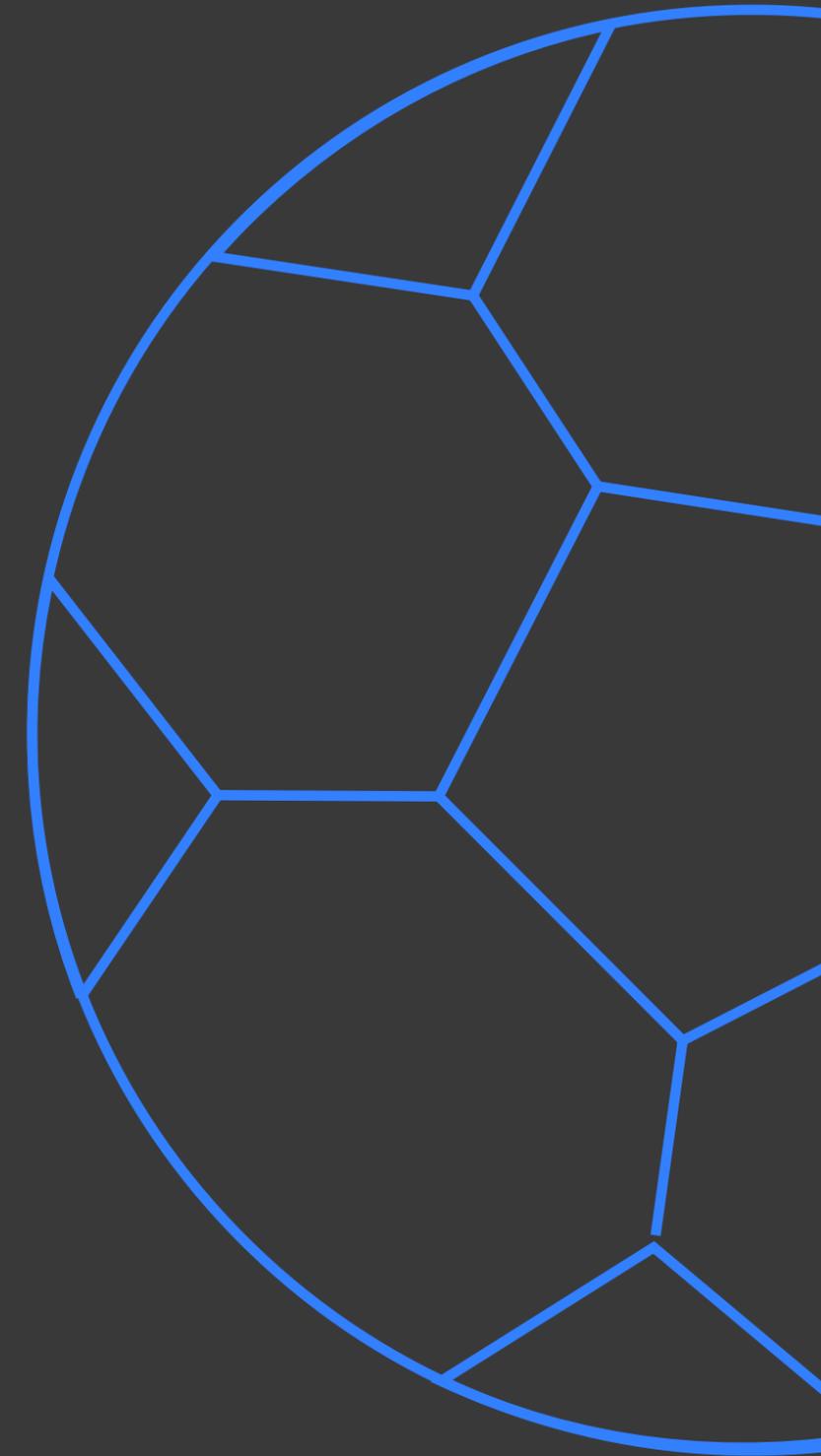
But it's challenging for OTT video networks to match (and enhance) the reliable quality that traditional broadcast networks have been providing for years—for a number of reasons.

One is balancing video quality with bandwidth efficiency—that can be resolved by encoding for *constant quality* instead of *bit-rate* as described in the previous section.

One is managing latency over the open internet—fans on the edge of their seat have minimal tolerance for delays or stutters (or sudden drops in picture quality from network congestion and packet loss).

One is scalability—streaming rights are an expensive investment, and video providers need to maximize their returns with a network that can distribute the same content to millions of concurrent viewers.

Let's take a look at two key ways video providers can improve their video network to ease latency and scalability challenges for live OTT content



Latency

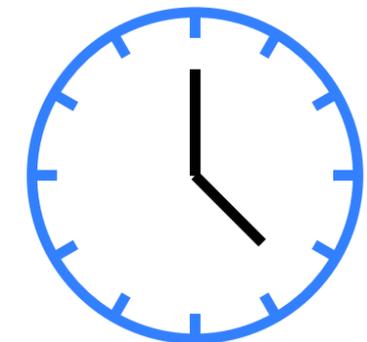
Content Delivery Network (CDN) latency is the most common downfall of OTT live events. If viewers see the winning goal reported on social media before they see it on the stream, their excitement evaporates.

The trouble is that the traditional ABR streaming protocols used for OTT delivery of live content were never intended to compete with broadcast. Most traditional ABR clients try to segment and buffer multiple chunks of content before they're displayed, so streams regularly experience 45-60 delays.

New live streaming protocols segment content into much smaller chunks—say, 200ms versus 6 seconds—so it's much faster and more efficient to get great-looking live content from the source to the screen (glass to glass).

Crucially though, every component in the pipeline needs to support the new protocols to realize the low-latency gains.

Video players exploring live OTT content should work with providers that offer end-to-end low-latency pipelines.



Scalability

Traditional broadcast delivery of live video uses a one-to-all transfer method: video content can be distributed once and consumed by multiple clients.

Traditional OTT delivery uses unicast transfer to deliver dedicated content from a CDN to individual subscribers via ABR clients.

But unicast delivery doesn't scale effectively enough for live content. The access networks - say, from a cable provider - that sit between CDNs and subscribers can't scale to handle millions of identical streams for each subscriber.

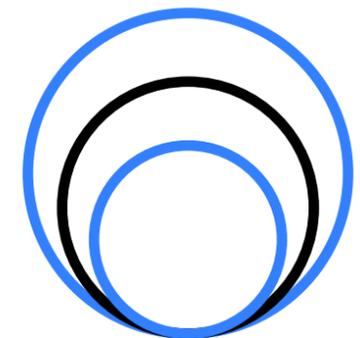
And even if they could, increasing the capacity of CDNs to meet peak demand would be prohibitively expensive for most providers.

One answer can be a multicast ABR solution. **With multicast ABR, one video stream can be segmented and sent to multiple subscribers simultaneously using a multicast sender.**

This shifts some of the processing to a multicast receiver or gateway within subscriber's homes—which then unicast to individual screens. As a result, traffic is now proportional to the number of linear channels and no longer to the number of individual devices consuming it.

This significantly improves the Quality of Service on all home devices without simply increasing the peak capacity of the CDN at great expense.

To learn how to deliver a stunning low latency live streaming experience and scale like never before, [read our white paper](#).



Cloud and virtualization

For most providers, the move towards all-IP, software-defined video processing is inevitable, for a few reasons.

For one, it doesn't make sense to own and operate physical video infrastructure anymore. There's too much efficiency, flexibility and agility to be gained by shifting production and distribution workflows onto scalable, elastic (public or on-prem) cloud infrastructure.

But the cloud also makes new kinds of experiences possible. This isn't just about rebroadcasting great-looking linear TV experiences to IP-connected devices. It's about continually developing and launching new services and experiences that delight and attract viewers.

Smooth, seamless, personalized content, intelligent discovery and recommendations, flexible pricing and subscription options, advanced pausing and time-shift capabilities, interactive live content, and so on. Cloud-based video networks introduce a world of new opportunities for high-value change.

Here are just three of them...

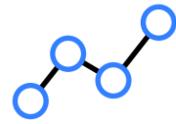


Scale with agility

Capturing, managing, transporting and archiving content are all expensive, intensive and highly interdependent processes. And that makes them ideal candidates for migration to elastic cloud infrastructure.

A software-defined, cloud-hosted video processing environment means you can provision more resources as demand dictates—scaling up for events like breaking news, season premieres and finales and live programming, and scaling back down during quiet periods.

You can also develop and deploy new services faster—launching new channels in minutes rather than weeks. And viewers benefit from more reliable and performant networks than most video providers could afford independently.

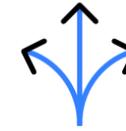


Manage more efficiently

Software-defined video networks also make it significantly easier to manage multiple services.

As traditional broadcasters develop new offerings that blend broadcast and broadband services—across different content streams, delivery mechanisms and user-devices—they can consolidate multiple functions into a single point of management through a converged headend.

Being able to manage everything centrally will provide huge economies of scale for providers looking to experiment, grow efficiently and drive integration between multiple services.



Operate more flexibly

Cloud-based operations offer simplified, centralized management of all technology processes. Everything from service status, to development progress to reporting is live, accurate and visible—so teams can spend less time tracking progress in spreadsheets and more time on creative work.

The combined benefit of live updates and short lead times means your teams can react and adapt to changes in near real-time. This agility benefits everyone: your customers, your advertising partnerships and your shareholders.

If you're looking for an end-to-end cloud solution that helps you deliver a multi-screen experience on any device, read Synamedia's [Cloud DVR At-A-Glance brochure](#).

Security

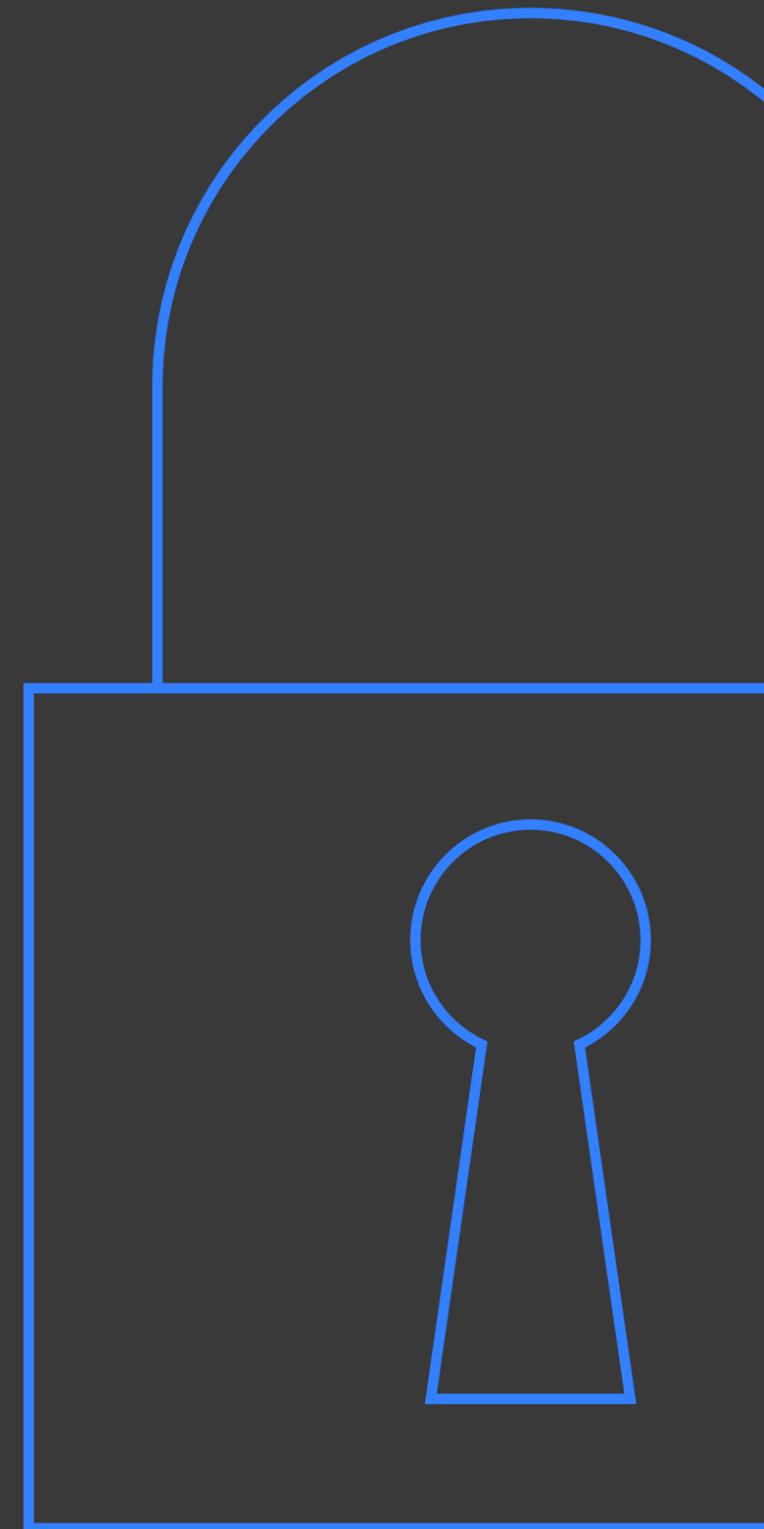
Security is a critical piece of the new video network puzzle.

Piracy is evolving just as fast as the rest of the rest of the video landscape, and as your video network transforms to seize new opportunities, you need to secure every part of it in order to protect the returns on your investments.

Most players need a proactive and multi-layered approach—to not only protect their content wherever its playing, but to detect and disrupt new pirate operations running as commercial ventures.

Because, just like every cent you spend on your network, every cent you spend on content needs to work as hard as possible for you.

If you're looking to detect and disrupt piracy leaks across your broadcast and OTT services, read Synamedia's [Streaming Piracy Disruption At-A-Glance brochure](#).



Conclusion

To win in the age of Infinite Entertainment you need a video network optimized for flexibility, scale and agility.

That's going to mean something different for everybody—depending on your legacy infrastructure, your available resources and your strategic ambitions.

What's true for everybody is that as the world's video networks shift towards the all-IP future, the playing field has been levelled for everybody.

New, cloud-native OTT players have an opportunity to build quickly, fail fast, and make targeted moves towards previously inaccessible audiences.

More traditional broadcasters can amend their established services with innovative new viewing experiences, presenting an integrated offering to consumers already drowning in choice.

Ultimately, it's customers that'll decide who wins. And the good news is that while viewer behavior is changing, their appetite for great video experiences is still growing and diversifying.

There's room for a huge variety of blended offerings—viewers aren't simply abandoning linear TV for on-demand, or broadcast services for broadband offerings. Instead, they're consuming more of everything—watching D2C OTT services on their phone, live TV on their laptop and Youtube on their TV.

Building a video network that can accommodate that range is the key challenge here—to grow your audience, you need content that looks and sounds incredible, on every screen, anywhere.

Get in touch to find out more—we'd love to help.

[Get in touch](#)