

## WHITE PAPER

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# Broadband and Pay TV Operators Adopt CDN Strategies to Manage Changes in Consumer Video Behavior

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## IDC OPINION

Rapid adoption of new networked devices such as smartphones, tablets, and smart TVs is having a profound effect on the consumer market. This device adoption, coupled with the growing user base of online or over-the-top (OTT) video services such as Netflix, creates challenges as well as opportunities for network operators that offer broadband and multichannel pay TV. How these operators respond to evolving consumer behaviors and new competitive threats will impact how well positioned these operators are to grow market share and revenue in the years to come. One facet of this response is the emergence of operator content delivery network (CDN) strategies. As detailed in this White Paper, operator CDNs form an essential foundation for advanced services and improved consumer experiences. Key themes discussed in this paper include:

- ☒ How operator CDNs support the rollout of multiscreen video services known as TV Everywhere (TVE) in which traditional pay TV services extend beyond the set-top box (STB) to various networked devices in and out of the home
- ☒ How operator CDNs provide the necessary infrastructure for network capacity management and support operator initiatives to migrate to an all-IP video distribution platform
- ☒ How operator CDNs serve to help maintain and grow the existing video subscriber base and how improved video experiences can drive revenue opportunities
- ☒ How operator CDNs can improve video experiences, reduce customer complaints, and drive demand for higher-priced broadband services

## METHODOLOGY

This White Paper draws on IDC's ongoing research into the consumer video and broadband markets. This includes existing research on the evolution and consumer adoption of video and broadband services, the proliferation of networked devices, and the operator competitive environment. To draw connections between key market trends and the importance of operator CDN strategies, IDC conducted a series of discussions with leading communications service providers in the United States. These discussions addressed how operator CDNs support new service rollouts, revenue growth, customer care, and network management. This paper does not highlight specific operators. Instead, this paper aggregates themes, objectives, and initiatives addressed during discussions with operators in conjunction with IDC primary research to assess the value proposition of operator CDNs. This research also draws on IDC's 2013 *Consumer Multiplay Survey* in which U.S. consumers were asked about attitudes toward, usage of, and expectations around telecommunications services including multiscreen pay TV.

## IN THIS WHITE PAPER

This IDC White Paper examines the evolution of the consumer market with respect to advanced video services and other opportunities enabled by operator CDNs.

## SITUATION OVERVIEW

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### Introduction

Changes in the consumer market, specifically around video consumption and the adoption of networked devices such as smartphones, tablets, smart TVs, and connected game consoles, are having a profound effect on operator networks and strategies. The use of various networked devices for video consumption puts growing pressure on broadband networks that strain under the weight of increased video traffic. OTT video services represent not only a challenge to broadband network capacity but also a threat to traditional multichannel pay TV services. Operators need solutions to help improve consumer experiences, manage traffic on their broadband networks, and increase competitiveness with respect to video and broadband services. The stakes are high, and failure to act not only reduces opportunities for revenue growth but weakens an operator's ability to compete in a fiercely competitive market.

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### Market Situation

#### *The Evolving Consumer Market*

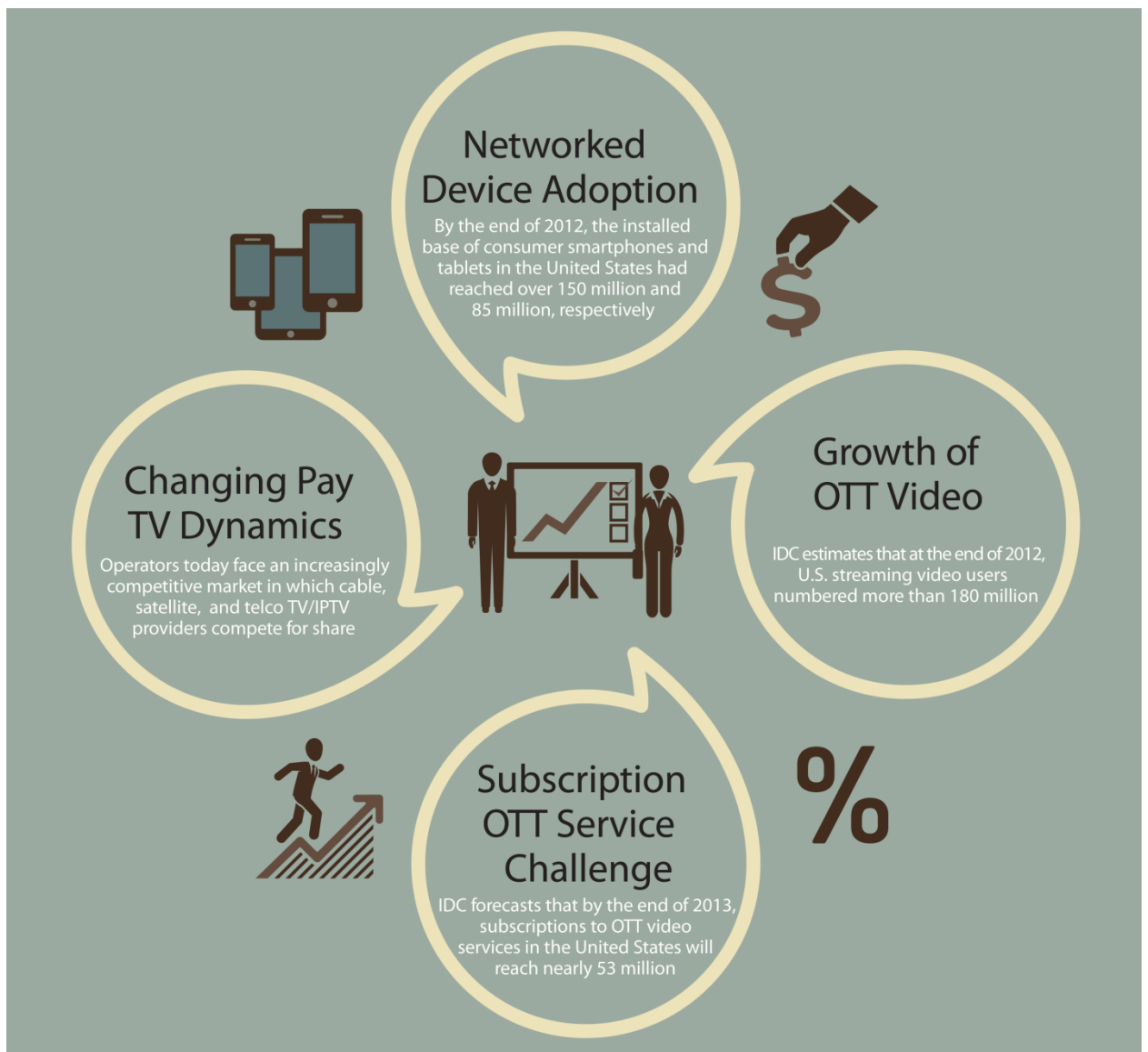
Four key market trends are converging to create challenges, opportunities, and uncertainties for operators serving the consumer video and broadband markets (see Figure 1). These four trends are:

- ☒ **Networked device adoption.** By the end of 2012, the installed base of consumer smartphones and tablets in the United States had reached over 150 million and 85 million, respectively, with significant growth ongoing. U.S. shipments of connected TVs surpassed 22 million in 2012 as the base of households in the United States actively using a connected device to stream video to the television topped 20 million in early 2013.
- ☒ **Growth of OTT video.** Online video use continues to grow, driven not just by the proliferation of devices that make content accessible nearly anywhere but by a user base that continues to expand. IDC estimates that at the end of 2012, U.S. streaming video users numbered more than 180 million, up from fewer than 85 million at the end of 2009. While YouTube may dominate the market in terms of users and video views, OTT video consumption has moved well beyond clips and user-generated content as HD-quality video is now the norm from sites offering TV shows and movies.
- ☒ **Subscription OTT service challenge.** IDC forecasts that by the end of 2013, subscriptions to OTT video services in the United States will reach nearly 53 million, with just under 40 million U.S. households subscribing to one or more OTT video services. This level of penetration fuels competitive threats as consumers have access to high-quality content outside the context of traditional multichannel pay TV. The challenge posed by OTT video growth goes beyond the obvious competitive pressure. Increased consumption of HD-quality long form OTT video puts considerable strain on broadband networks.

☒ **Changing pay TV dynamics.** In addition to competition from OTT providers, operators today face an increasingly competitive market in which cable, satellite, and telco TV/IPTV providers compete for share. Telco TV providers have carved out a 10% share of the U.S. multichannel pay TV market, while cable's share has declined. The satellite segment has maintained its share even as quarterly subscriber fluctuation takes place. Competitive positioning bolstered by innovation, advanced services, and improved consumer experiences is an important element for all pay TV providers in the battle to manage churn and maintain and grow market position.

**FIGURE 1**

Consumer Market Evolution



Source: IDC, 2013

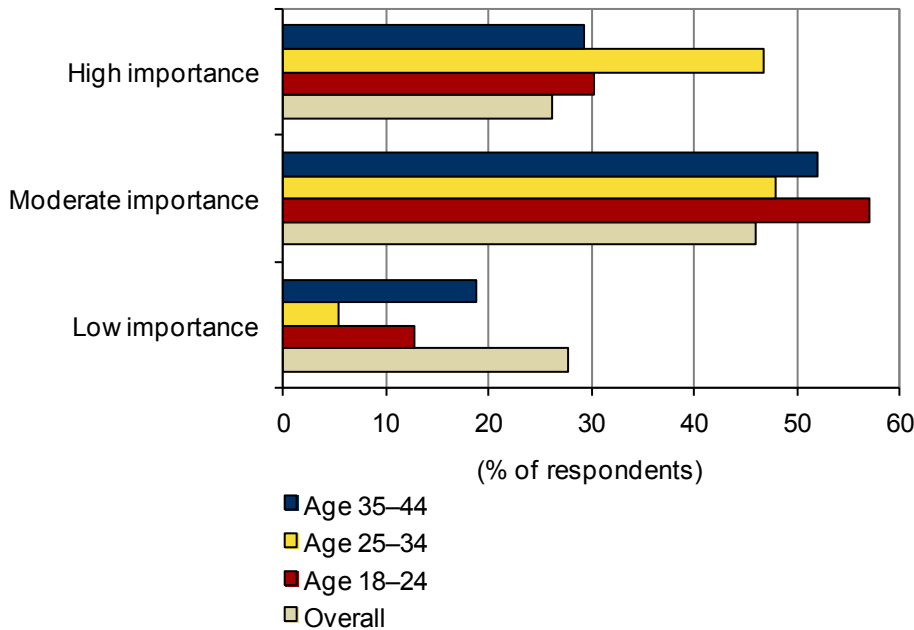
These trends factor into consumer decision making with respect to broadband and video services. While many consumers still make service selection decisions based on price, frequent users of online video are more likely to subscribe to faster broadband services and view speed — arguably a surrogate for quality of experience — as more important than price.

As a result of these trends, operators must work to strengthen their market position across both broadband and pay TV services. In addition to managing traffic on broadband networks, operators need to respond to competitive threats with new services. One facet of these new services is the rise of TV Everywhere in which on-demand and live/linear pay TV services are made available across networked devices. Today, many operators are still in the early stages of rolling out TVE services, and as shown in Figure 2, IDC survey data indicates that over 70% of all subscribers — and an even higher percentage of 18- to 34-year-old viewers — consider TVE a highly or moderately important offering.

**FIGURE 2**

**Importance of Multiscreen Video in the Home by Age Group**

*Q. On a scale of 1 to 10 where "1" is "not at all important" and "10" is "extremely important," how important do you think it is that your pay TV provider make live and on-demand programming that you subscribe to available to watch in your home on devices such as tablets, smartphones, game consoles, and smart TVs?*



n = 877 respondents who subscribe to multichannel pay TV service

Note: On a scale of 1–10, high importance = 8–10, moderate importance = 4–7, and low importance = 1–3.

Source: IDC, 2013

Strengthening market position with advanced services that have broad subscriber appeal can have a meaningful impact on operator revenue. With approximately \$80 in average monthly video revenue per subscriber, reducing churn and increasing market share translate to millions in potential revenue. Every 50,000 subscribers gained per year (or for every reduction in subscriber losses by 50,000 per year) represents nearly \$50 million in gained or saved annual video revenue. Broadband, voice, and other service revenue derived from these same subscribers raises the stakes even higher.

### ***Video Delivery and Consumer Experiences***

Managing network traffic and offering new services such as TVE are just two of the many challenges facing operators. When operators drill into the details of these and other challenges, other items of concern emerge.

TVE is simply one facet of a much broader focus on IP delivery of video. For cable providers, migration to IP delivery has been a common theme for a number of years, but recent attention on TVE and the need to counter competitive threats from OTT providers have made it a more heightened priority. Operators need solutions to enable IP delivery of video both in and out of the home. This includes the efficient movement of video within the network, from central datacenters to the edge, as well as out to consumers wherever they might be and to whatever devices they may use. A focus simply on TVE distribution as a distinct service does not necessarily enable a full integration of video distribution into a single converged service for consumers across all devices. Therefore, TVE, cloud digital video recorder (DVR), and IP distribution of on-demand and live/linear content represent components of a complex all-IP network strategy.

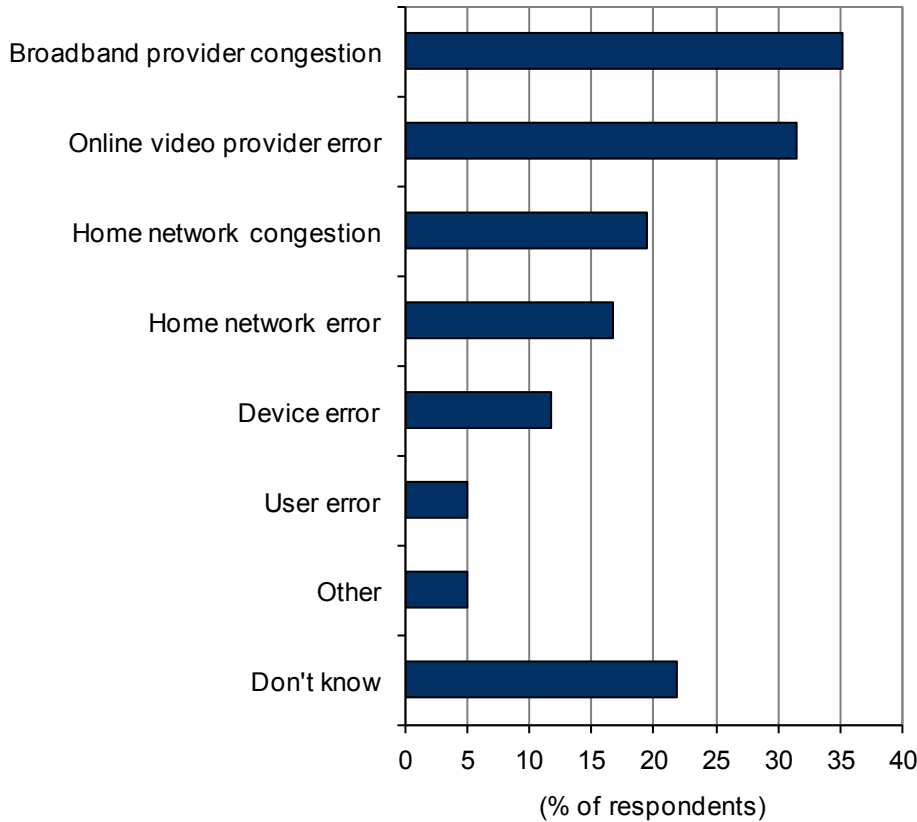
Much like during the early days of video on demand (VOD) deployments, business models to support these efforts are still uncertain. Arguably, there are opportunities to charge more for multiscreen services and thereby monetize the investment in supporting infrastructure and enabling solutions. However, there are other means by which service providers can monetize their investments ranging from subscriber acquisitions, churn reduction, and cost management. In terms of cost management, with the growth of OTT video, operators have an opportunity to host OTT content in their network and manage distribution for content owners and OTT providers.

Such initiatives have benefits beyond network capacity management. Smart solutions for managing video distribution and improving user experiences — whether for TVE or OTT — can pay dividends for operators in terms of increased customer satisfaction and decreased customer complaints. As shown in Figure 3, when OTT video streaming is not working right, viewers most commonly place the blame with the operator. In fact, poor experiences are blamed more on the broadband provider than on the OTT provider. Consequently, poor video experiences impact both subscriber satisfaction and operator profitability; call centers and truck rolls are expensive, and improved customer experiences can reduce demands placed on operator support services. Solving the customer perception problem requires improving the overall OTT video experience.

**FIGURE 3**

**Blaming the Operator for Video Streaming Problems**

Q. *When something goes wrong with the streaming of TV shows, movies, or videos from the Internet to your television, what are the most common sources of the problem? Select up to three.*



n = 298 respondents who do networked video

Source: IDC, 2013

**FUTURE OUTLOOK**

**Operator CDN Is Part of the Solution**

***Why Adopt Operator CDN Solutions?***

CDNs have long been a core facet of the Internet. A CDN's distributed network of content servers provides a wide range of benefits for both content providers and end users, including improved scalability and performance, increased availability, traffic management, and load balancing. Moreover, CDNs have been instrumental in aiding the rapid development of OTT video distribution. As OTT video traffic consumes an increasing share of network bandwidth, and as operators seek to distribute their own video services across multiple IP-enabled screens, the CDN market is evolving from

one typically characterized by third-party CDNs (that is, operated by neither the content provider nor the operator) to one in which operators are increasingly taking steps to deploy their own CDN solutions within their networks. In this evolution, operators join third-party CDN providers as important stakeholders in the content delivery ecosystem.

Many operators, particularly those that are medium sized to large, are already in the process of implementing a CDN strategy, with many other operators still considering next steps. As discussed in conversations with operators, CDN initiatives are a key part of a strategy to address the market challenges, opportunities, and uncertainties. The role of an operator CDN spans a broad range of services and revenue opportunities, but the focus of operators is in many ways on the big picture and the future of video delivery to consumers.

That big picture includes how to best serve customers, how to roll out services that will enable a high degree of competitiveness, and how to best lay the foundation for future opportunities. This means that to a large degree, a broad decision to implement an operator CDN rests not on a single service or specific incremental revenue opportunity but on the overarching need to put in place technology that promotes the use of services and allows those services to be the engine for attracting and retaining subscribers. In the face of a fierce competitive environment, such a strategy is a necessity to bring benefits to both the subscriber and the operator.

### ***Subscriber Benefits***

Operators that have rolled out, or are in the process of rolling out, a CDN are quick to note the subscriber benefits associated with the strategy:

- ☒ **Multiscreen.** First and foremost, operator CDNs are about enabling content consumption on more screens. Video must be accessible beyond the set-top box, and as several operators noted in discussions, changing consumer behaviors and expectations cannot be ignored and the CDN is a critical enabler of multiscreen delivery.
- ☒ **Control.** Beyond multiscreen consumption, consumers are demanding more control of their content experiences. As part of the broader move to time and place shifting of content, operators consider their CDNs to be a key facet of their efforts to give more control to the viewer through VOD, TVE, and cloud-based digital video recorders.
- ☒ **Improved experiences.** New services need to be coupled with improved experiences, and operators view the CDN as a means to improve both OTT and TVE experiences. Faster delivery of content hosted in the network and an interest in increasing video quality are part of this effort.
- ☒ **More content.** Offering viewers a vast library of content is a means to address both competitive threats and a highly fragmented user base. Operators note that CDNs enable them to offer broader content libraries and scale services such as VOD and TVE through central processing of content and optimized positioning of content within the network.

## ***Operator Benefits***

Beyond benefits associated with improved consumer experiences, operators view their CDN initiatives as a foundation for service enablement and revenue opportunities:

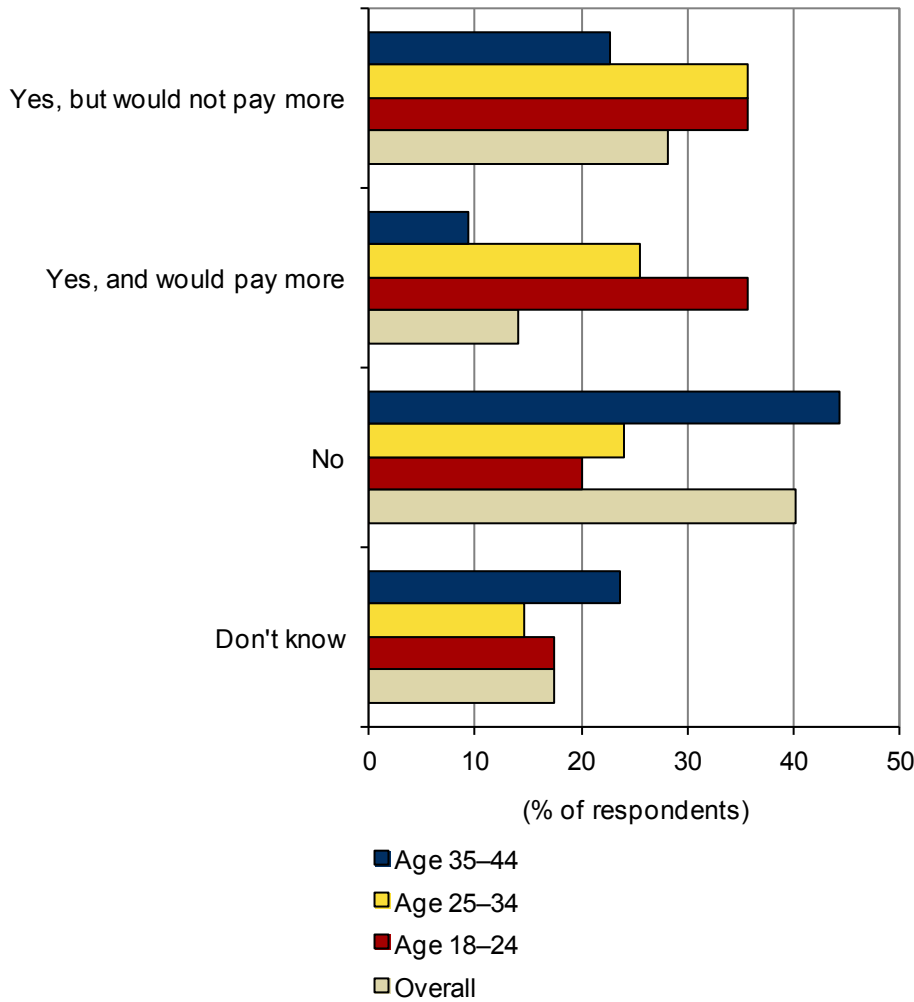
- ☒ **CDNs essential for TVE.** Operators note the need for CDNs to support TVE initiatives. In terms of the competitive environment, these operators believe TVE is not an option but a requirement. Without a multiscreen video strategy, these operators believe their ability to compete will be curtailed and therefore the CDN is a critical element in maintaining and growing the subscriber base and supporting the adoption of premium video services. The revenue driven by these services amounts to more than just an incremental gain; operators note the revenue opportunity is tied to the full value of the subscriber and the average monthly video revenue of nearly \$80.
- ☒ **CDN infrastructure supporting a full migration to IP.** This notion is a critical facet of how some operators view their CDN investments. These operators note that the CDN is the foundation of next-generation IP delivery both on and off their network and to both managed and unmanaged devices. That is, in addition to supporting IP video delivery to subscribers within the existing network footprint, the promise of TVE demands accessibility beyond the network footprint as well. Moreover, IP distribution must extend beyond the managed set-top box to unmanaged devices owned by the consumer. Operators see their CDN investments as a means to support their customers wherever they are, irrespective of consumption device.
- ☒ **Network transformation.** While initial CDN deployments enable IP delivery to run in parallel with existing infrastructure, the intent of some operators is to migrate from an IP overlay scenario to a unified CDN-based video delivery platform. This transformation of operator distribution networks puts the CDN at the core of next-generation IP video delivery. The benefits extend from near-term reduced dependency on and longer-term replacement for a legacy delivery infrastructure that is not suited to meet the needs of the user paradigm of multiscreen consumption.
- ☒ **Network traffic and cost management benefits.** Given the rapid growth of online video traffic, operators are faced with demand for bandwidth that requires ongoing investments in network buildout. While managing costs or offering other revenue-generating services is less important for some operators than supporting the core video offering with higher-quality services, operators see value in CDNs that help reduce network costs by hosting content within the network and ease traffic and network capacity concerns by pre-positioning content within the network. The savings can extend across backbone, transit, and peering bandwidth.
- ☒ **CDN supporting services that can reduce churn.** Operators firmly believe that advanced video services increase subscriber loyalty and drive service stickiness. Operators that have deployed video services across devices beyond the STB note that the overall subscriber engagement with video services increases. IDC believes that operator CDNs support services that will help translate subscriber loyalty and service stickiness into churn reduction. Figure 4 details the churn risks associated with not offering TVE services, with millennials highly likely to consider switching to another provider.



**FIGURE 4**

**Churn Risks Associated with Not Offering TVE by Age Group**

*Q. If your pay TV provider did NOT offer a service that delivered live and on-demand television programming to PCs, tablets, smartphones, game consoles, and other connected devices, but another pay TV provider did, would you switch to the other provider?*



n = 611 respondents who would use a multiscreen if available

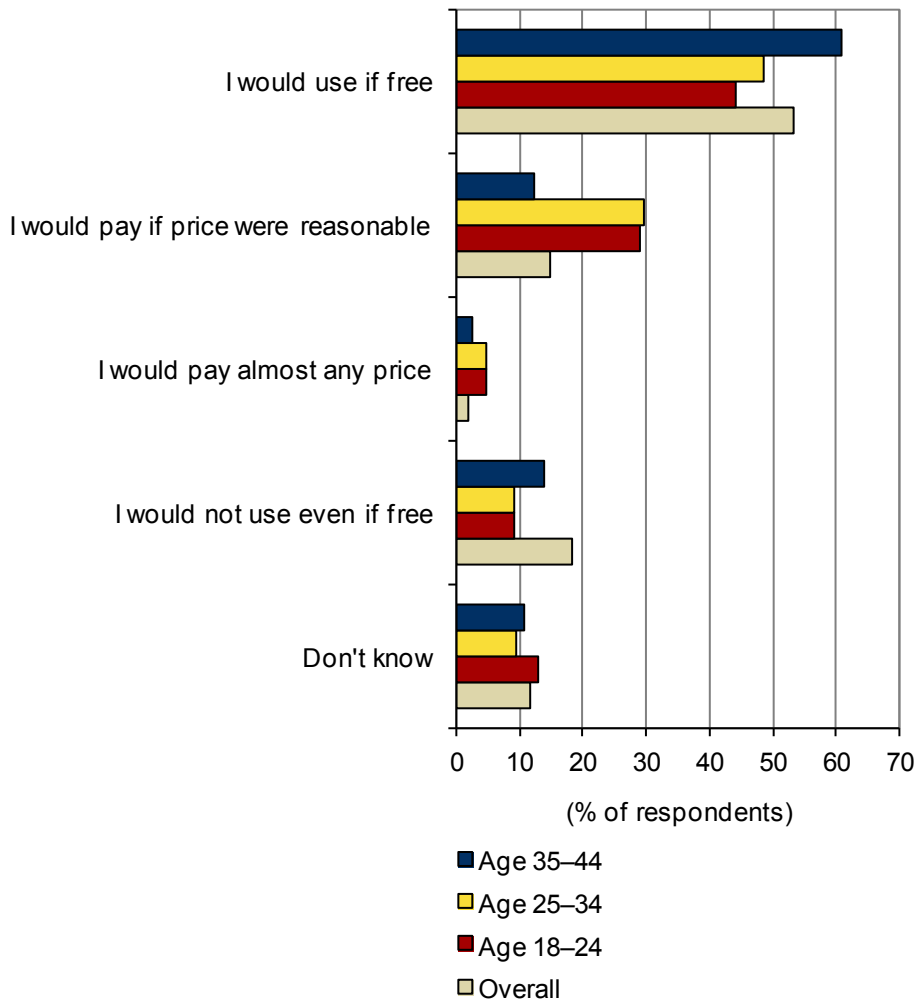
Source, IDC, 2013

☒ **Broadband sales opportunities.** Improved TVE and OTT experiences can do more than drive overall subscriber revenue from customer retention and increased loyalty. While it may seem counterintuitive, given the strain OTT video puts on broadband networks, our findings suggest that operators also hope to leverage CDN investments as a means to encourage more OTT consumption, which will drive demand for faster, and higher-priced, broadband services. Beyond driving demand for more broadband, as shown in Figure 5, improved OTT viewing experiences resonate with consumers and can provide important competitive differentiation. Even for subscribers who indicate improved OTT experiences are not worth paying extra for, they can still support competitive positioning of higher-tiered broadband services.

**FIGURE 5**

**Interest in Service That Provides Higher-Quality Online Video by Age Group**

Q. If your pay TV or Internet provider offered a service that provided higher-quality access (e.g., better picture, better sound, less buffering) to popular online video services that you may already use and possibly pay for, such as Netflix, Hulu, Amazon, which of the following statements would you agree with?



n = 877 respondents who subscribe to multichannel pay TV service

Source, IDC, 2013

**B2B opportunities.** Operators see a variety of revenue opportunities associated with their CDN investments. These extend beyond video applications as many hope to host enterprise services within their networks. For video, however, operators hope to monetize their investments by getting paid to host content in their networks and provide OTT providers and subscribers an improved video experience. These services, however, are a ways off for some operators, while others are already hosting content but doing so without revenue benefits other than some cost savings.

# AKAMAI OPERATOR CDN SOLUTIONS

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## **Overview**

Among the vendors offering solutions for the operator CDN market is Akamai Technologies. Akamai's solutions for operators are rooted in the company's strong position in the Internet video market and bolstered by the company's 2012 acquisition of operator CDN specialist Verivue. The company has had success offering licensed products and CDN services to operators, and customers include leading operators in the United States and international markets. As a third-party CDN as well as a provider of operator CDN solutions, Akamai is differentiated relative to traditional network equipment vendors and has a rich history of delivering Internet content, including video at scale. Akamai's existing concentration on video delivery allows the company to stay focused on innovation and support for the latest devices, protocols, and content protection standards that are essential facets of the fast-evolving multiscreen video market.

Akamai offers two primary solutions for the operator CDN market. One is a turnkey media CDN, and the other is a fully licensed CDN software solution. These solutions are supplemented by optional integration with Akamai's broader global CDN infrastructure.

### ***Aura Spectra***

Aura Spectra is a turnkey CDN solution for operators that is based on a software-as-a-service model. With Aura Spectra, operators achieve the benefits of having a CDN with dedicated capacity to support multiscreen video and commercial CDN services without the need for up-front capital expenditure (capex) investments. This solution reduces the complexities of CDN deployment and management and is ideal for operators that are not now, or perhaps never will be, ready for a wholly operator owned and managed CDN. With an Aura Spectra implementation, the operator maintains control over important business decisions, such as capacity, network locations, content provisioning, reporting, and billing, while leveraging Akamai's expertise and scale as Akamai maintains and monitors the CDN infrastructure.

### ***Aura Lumen***

For an operator that wants to build and operate a highly scalable CDN to support multiscreen video delivery as well as commercial CDN services, Aura Lumen is a licensed software offering that runs on commercial off-the-shelf (COTS) hardware and virtual machine (VM) environments. Because Aura Lumen runs on commodity hardware, operators are able to build CDN and multiscreen video delivery infrastructure without being tied to proprietary hardware platforms. With Aura Lumen, the CDN is fully owned and managed by the operator. The Aura Lumen architecture features HyperCache, Request Router, Object Store, Intercept Service, and Control System software components designed to support scalable and efficient content hosting, transport, and delivery within the operator network.

## ***Akamai Federation***

An important facet of multiscreen delivery of an operator's managed video service is that ideal implementations will extend beyond an operator's physical network footprint. Both Aura Spectra and Aura Lumen are able to fully integrate with the Akamai Intelligent Platform, Akamai's global CDN infrastructure. This interconnection, or federation, allows operators to take advantage of Akamai's global scale to optimize off-network content delivery and to support overflow needs in which redundancy and additional capacity may be required on a planned or even unplanned basis.

## **OPPORTUNITIES/CHALLENGES**

CDN solutions are offered by a range of vendors in addition to Akamai, notably the large equipment providers already serving the operator market. Different implementation models exist, with some operators interested in having a vendor help build and maintain the CDN in advance of passing control to the operator. Operators note that there can be a learning curve associated with CDN implementations, and some operators see value in the "build, maintain, transfer" model.

What is clear from operators is that solutions must be scalable. All agree that TVE is still in its infancy, and while OTT video consumption is growing, the opportunities for content hosting within the network are still emerging. As such, operators express the requirement for solutions to expand as capacity needs increase. Operators also understand the rapidly changing IP video technology landscape in which new devices and codecs must be supported. This drives the need for CDN solutions that are both upgradable and able to be maintained in a modular fashion so that maintenance and upgrades do not interfere with operations.

The emergence and mainstreaming of operator CDNs are not without challenges. Implementing new solutions is not easy, and new architecture decisions must account for a wide range of network considerations. Also, operators are in various stages of embracing TVE and other advanced consumer services.

Many of the challenges facing the market extend beyond the CDN itself. For the potential of TVE and the capabilities of the CDN to be fully leveraged, customer education is required in order to foster demand. At the same time, usage of TVE is hindered by complex content licensing requirements that render TVE content offerings inconsistent across operators and not in parity with what viewers can access within the traditional STB-based environment. This is further exacerbated by the fragmentation of the consumer device market, which tends to require custom applications to be built for each device platform — a problem that means slow rollout of services across the range of popular devices. Within the B2B segment, many operators are cautious with respect to realizing opportunities in the near term as priorities centered on video services are coupled with an understanding of the challenges associated with growing new businesses tempered by expectations of immediate incremental revenue growth.

Operators are also in the process of evaluating and in some cases adopting and deploying technologies that can compete with some elements of the operator CDN value proposition. New gateway STBs are capable of managing IP distribution in the

home, reducing the near-term need for robust network-based delivery solutions. Also, managed multiscreen services are available from a number of vendors. These solutions (in some cases proprietary and in other cases a mix of point solutions) provide cloud-based content transformation, hosting, and delivery services for operator TVE services. These managed multiscreen services can certainly work in conjunction with an operator CDN but are often integrated with third-party CDNs for content delivery. The solutions speak to the complexity of and wide range of solutions available for multiscreen video delivery.

Challenges notwithstanding, operators need to formulate solid content delivery strategies in order to implement services that meet evolving consumer demands. The strategic importance of offering advanced video services and improved consumer experiences goes hand in hand with maintaining and growing broadband and pay TV services revenue.

## **CONCLUSION**

Operator CDNs are an important part of the video delivery landscape, and many leading operators recognize the value of investing in CDN solutions. Driving these investments are changes in consumer device adoption and content consumption that increase the need for new solutions that support multiscreen video distribution and other emerging business opportunities. Operators that are engaged in CDN strategies aim to leverage these investments to offer services that improve consumer experiences, increase service stickiness, drive new revenue streams, and reduce customer churn. Moreover, operator CDNs are viewed as a key piece of a broader network transformation.

IDC believes that for operators, doing nothing is not an option. With the competitive environment changing and consumer demands evolving, new services and associated enabling technologies are the foundation for new market opportunities and improved competitive positioning.

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