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Summer 2017

Crowning a New Content King

Arrived—OTT content emerges from the shadows



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Delivering World-Class Video

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You're Doing it Wrong

Programming Rights in an OTT World

A How-to Guide

Installing Apps on OTT Devices

Executive Q&A Series



Barbara Ford Grant
HBO



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Content is (Sort of) Still King of OTT

By: Brian Mahony

My son Jack came into my office with a beaming smile. He was watching the NBA play-offs on his iPhone, but I noticed a big pop-up box blocking most of the center of the screen: “You must be a subscriber to watch this content.”

“Mom said I couldn’t watch TV because I didn’t finish my homework,” he said.

I raised my eyebrows.

“Really Jack? Not only are you defying your Mom’s intent, but you’re going to watch that crappy content with only audio and some obstructed video,” I admonished.

“It’s fine Dad,” he rebutted. “I can hear everything going on, can see the score, and catch some of the plays at the edges of the screen.”

He was too gleeful and proud of his handiwork for me to squash his creativity, so I just shrugged my shoulders and walked into the family room. There I found my daughter Casey watching *Blue Bloods* re-runs on Netflix.

“I’ve seen this episode like 50 times,” she said. “I think I’ll just go to bed early.” It was 10:30 on a Friday night. As she exited Netflix the screen reverted to Comcast cable TV and, lo and behold,

there playing was the most recent linear episode of *Blue Bloods*.

“Oh no! I missed it! A new one was on and I missed it!” she shrieked. “It’s already half over.” With a big frown on her face, she turned off the TV, dropped the remote control indignantly on the couch, and rose to leave the room.

“Wait, aren’t you going to watch your favorite show?” I asked.

“Nope, I’ll wait ‘til it comes out on Netflix.” And with that she sauntered off.

Meanwhile, my lovely wife Kirsten entered the room. I remembered that I had promised to cuddle in front of a movie for “date night.” I forgot but I acted like that was my plan all along.

“Ready for date night?” I asked, laying down the charm.

“Sure, can we watch *Manchester-by-the-Sea*?” she inquired.

Of course, I really wanted to watch *Hacksaw Ridge* but I knew that wasn’t in the cards.

After searching around a bit to no avail on several different devices and screens, I finally put down the remote and picked up my iPhone to search Google. I discovered we could rent it from Amazon for \$10, but we’d have to go downstairs



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in my man-cave to watch it (there is no Amazon app on my Samsung Smart TV and I haven’t figured out how to add it). My man-cave is decidedly dark and sports-oriented, with a pool table, dart board, Xbox, and drink rail— definitely not conducive to cuddling.

“Oh, that’s OK. I’m tired and don’t really want to watch in the basement,” she pondered. “I think I’ll just go to bed.” With a yawn, she crawled from the couch and walked upstairs.

I flopped on the couch— defeated. Just then Jack popped in. “Dad, the Celtics just had this crazy play to take the lead!” he exclaimed excitedly.

“How can you tell with that box blocking your view?” I asked. “Go to bed Jack, the Celtics are going to get crushed... just watch.”

As I sat there alone with my scotch, I wondered how we got here. My son is watching obstructed, low-quality content on his phone and loving it. My daughter missed a new episode of her favorite show because she was busy scanning re-runs. And my wife, while all set to watch the “chick flick” she had picked out, declined due to the venue (hopefully not the company).

Welcome to the new world of OTT, where content is still king. Sort of. □



Upside down: consumer’s content choices are confused by discovery and device options—and even venue

✓ Best Practices

Leveraging the Latest OTT Technology to Deliver the Greatest OTT Content

By: Jason Friedlander

Broadcasters, studios and other content publishers are beginning to realize the full potential of OTT content delivery, thanks to the ongoing maturation of video streaming platforms and services. Working with streaming and distribution technology partners, they can deliver programming and advertising that look, feel and act like traditional broadcast TV, but with a unique degree of personalization and the flexibility of anywhere, anytime viewing.

An end-to-end platform for video streaming can give content publishers the tools needed to encode, package and deliver content to each viewer. Keep an eye on the full delivery infrastructure, even the “last mile”, and leverage this knowledge in real time to offer the best possible and most personalized experience to all viewers. The aggregation and intelligent application of data on viewer habits and preferences allows publishers to go one step further and serve up timely, relevant content that’s likely to satisfy the individual viewer and extend his or her viewing sessions.

At the same time, today’s sophisticated end-to-end video streaming platforms are becoming increasingly effective and agile in supporting demanding applications and new use cases. Despite many obstacles to success, live streaming at scale has become relatively straightforward— and the result ever more like the live broadcast

TV experience that media consumers expect.

Unprecedented personalization, smooth live streaming at scale and support for new formats are examples of the power of OTT services to transform the viewing experience. The evolution of the technologies and platforms supporting OTT delivery is also changing the very nature of content creation workflows and the publishing business itself.

Although TV Everywhere and OTT providers are finding ever-greater success in monetizing their multiplatform media streaming services, many still lack the data needed to determine if a piece of content they produced or licensed is making money. Understanding that this knowledge is essential to maximizing revenue generation, providers of advanced streaming platforms are using new technologies and workflow models to offer better business insights and, in turn, raise the efficiency and profitability of OTT content delivery, all while lowering the overall risk of creating or acquiring new content.

By incorporating a cloud-based content intelligence system into the overall online video production and distribution pipeline, today’s streaming platforms are able to automate key processes across this pipeline and provide the timely and accurate cost, performance and revenue insights, into each piece of



Jason Friedlander is the director, marketing communications for Verizon Digital Media Services, where his primary objective is to raise the visibility of the company in the industry. Prior to his current role, Friedlander was the director, solutions engineering, media & entertainment, where he managed a global team of solutions engineers. Friedlander co-founded upLynk, an OVP specializing in simplifying broadcaster workflows during their transition to OTT. Verizon Digital Media Services acquired upLynk in 2013.

content, essential to building a profitable OTT service.

By orchestrating and streamlining the movement of metadata and digital media assets through production, approval, distribution, monetization and eventual consumption by viewers on connected devices, today’s leading-edge OTT streaming and distribution platforms not only enable users to optimize the end-to-end pipeline but also empower them to be agile in offering content and services that are well-aligned with viewer demand.

Working with such a platform, content creators and publishers are positioned to capitalize on the latest technical innovations, workflow efficiencies, and business strategies; which, together allow for smarter, more profitable, and more engaging offerings and services. □



OTT content delivery is moving to the cloud.

✓ Best Practices

Boxing Strategically: The Future of the Set-Top Box

By: Anthony Smith-Chaigneau

Over the years I have seen the rise of multiscreen viewing, subscription video-on-demand (SVOD) and over the top (OTT) services fundamentally change the television watching experience. One of the biggest questions I hear from pay-TV operators is whether the set-top box (STB) needs to evolve to adapt to this new reality. These are early days and there is of course no definitive answer. However, a division has emerged between those operators considering other platforms and those that believe the best pay-TV experience can still be obtained through the STB.

During the first decade of the century, European pay-TV providers had more time to focus on developing their STBs. Shuja Khan, VP of Revenue Growth Transformation, Liberty Global, explains how expectations have changed. “[Customers] are now used to almost continuous app updates compared to the 3-5 year refresh cycles we used to have... It feels like we’ve gone from a jog to a sprint triathlon!”

As a result, a number of pay-TV operators are moving towards more flexible software platforms such as

browser-based HTML5 apps. These apps enable operators to move toward a “constant evolution” model in which they can update their STBs on a daily basis and deliver new service features more quickly. However, with increased speed comes a reduction in reliability. Just as mobile apps are frequently affected by bugs, pay-TV operators adopting an app-based approach are at risk from some of the same reliability issues.

Thinking outside the box

The emergence of STB software-as-a-service has led certain pay-TV providers to outsource their STB software. In this scenario, operators pay to license the STB software rather than own it. Although eliminating the STB helps lower subscriber acquisition costs, there are downsides. Firstly, the lack of ownership means that operators may not be able to address specific development issues as quickly as they would like. Also, by maintaining only a skeleton software development team, operators may not save enormous amounts as they will still need to pay large license fees to the companies providing the software.



Anthony Smith-Chaigneau serves as NAGRA's Senior Director Product Marketing for NAGRA User Experience solutions and set-top boxes. A leading evangelist for interactive television, he is recognized as a major contributor to the world's interactive TV business, having held several senior management roles since 1999, including Advanced Digital Broadcast, Osmosys and Alticast as well as at the DVB Consortium where he was responsible for the market implementation of DVB Specifications. Anthony Smith-Chaigneau spent 15 Years in the Royal Air Force where he educated in Telecommunications, Electronics and Avionics, and is a seasoned speaker and spokesperson in the pay-TV space.



Operators need to think outside the box—the set-top-box—when designing TV platforms

Moreover, operators must accept appearing on customer devices alongside competitor services – not always an attractive proposition even for the largest providers.

Today, many operators want the best of both worlds and are looking for ways to both enter the OTT market and retain users on their pay-TV platforms. Sky Q, for example, gives Sky ownership of the primary input and ensures brand visibility on the STB; while the company's Now TV OTT video service enables it to give up some of that control and visibility in exchange for a presence on popular devices such as Apple TV and Roku. This offers Sky, and other operators that choose to go down the same route, the opportunity to connect with a market segment that has until now

proved resistant to the appeal of “full-fat” pay-TV.

But for many operators, giving up control of their STB to third parties is still not desirable. The primary reason is the consequent loss of control, not only over their brand and image, but over the increasingly important viewing data that can help operators understand users’ television habits and improve the experience for their customers. And not having an STB in the home means that disconnecting the service becomes much easier. This can result in higher churn - decreasing ARPU while increasing operations costs. A reliance on broadband can also lead to a rise in video quality problems, such as buffering issues. And while an all-software solution may increase flexibility, and therefore improve an operator’s NPS, an increase in video quality problems will do the opposite.

The future of the STB

For some operators, following customers onto connected devices is more important than retaining control over how they watch TV, even if it means an increased risk of churn. The willingness of some operators

to outsource the development and maintenance of STB software points to a growing adoption of the software-as-a-service model. And with capable platforms such as NAGRA’s intuiTV, operators have the opportunity to license the necessary STB software to run a modern pay-TV business.

Yet the reality is that most operators using STBs are, for good reason, reluctant to cede control of the pay-TV environment. By owning the software,



What will the future STB look like?

development and maintenance of the STB, operators can develop new hardware/software combinations, differentiate their service, and retain control of input one on the television set. And, for the majority of consumers today, TV remains *the dominant way* they enjoy content. This means that, for operators, providing an excellent experience through the STB remains an essential part of the business. □



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Migration of OTT Monitoring and Analysis to the Cloud

By: Ted Korte

The combination of digital media, internet and connected devices has created an irreversible one-to-one relationship between the consumer and content. It has changed the way that people watch TV, perhaps more than any other technical development since the dawn of the medium.

As an extension of this seachange, the amount of media produced and consumed today is far greater than at any time in television history. Unlike traditional TV platforms, OTT offers a medium for all of this content, both short-form and long-form. While Netflix and Hulu hold closer to the traditional long-form model of TV content, the aforementioned one-to-one relationship really centers around shorter form content viewed on mobile devices.

With OTT, there's an entire new universe for broadcasters to explore – and an inviting outlet for content producers that are new to the game.

However, with the production and delivery of all this content comes an important responsibility and even an expectation for professionals to deliver high-quality content. The very high-density, geographically-dispersed OTT landscape means staying on top of a significantly larger number of signals and locations than what terrestrial, cable and satellite systems typically deliver.

How does the OTT service provider effectively monitor, analyze and troubleshoot all of these streams from headend to the delivery point – with the understanding of the greater challenge that comes with quality assurance out to the last mile?

Laying the Foundation

The legacy approach to quality-of-service (QoS, for the service provider's infrastructure) and quality of experience (QoE, as in what the consumer receives) is beginning to fade. In the world of

digital TV, the multitude of streams – and amount of data that comes with them – makes point-based monitoring with purpose-built components a costly, time-consuming and highly complex endeavor. This is amplified in the OTT space, where such an endeavor would be near impossible to undertake given the high-density and geographically dispersed 1-1 nature of the beast.

Cloud-based monitoring aims to solve these problems, and has quickly evolved over the past 24 months as more suppliers bring viable solutions to market. Setting up, and later scaling an architecture, is as simple as understanding the components, where to deploy, and how to deploy – and tying this into the existing IT backbone. The general pieces of a Qligent Vision system, for example, require the following:

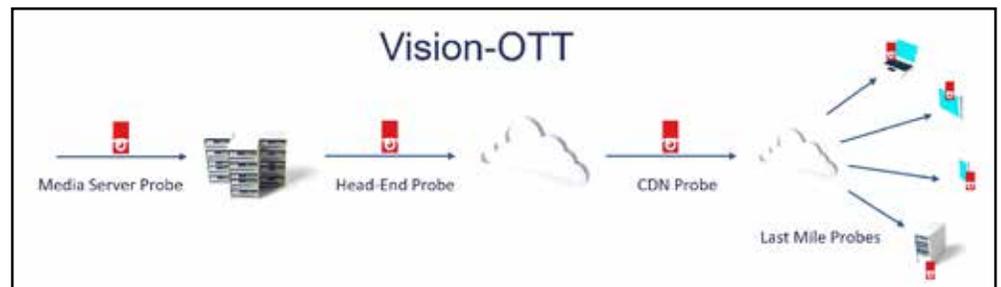
- A robust network with a minimum of 64kb/s of bandwidth
- The cloud, common, off-the-shelf servers, VM's, or similar platforms for content aggregation
- Networked and/or virtualized probes (or IoT-enabled end devices) that are remotely software-definable, and globally deployable – all communicating performance data to the central server(s)
- Browser-based devices for operators and engineers to view and analyze all



Ted Korte is the Chief Operating Officer of Qligent Inc. He has over 23 years' experience in the Broadcast industry delivering hardware and software solutions in Terrestrial TV and Radio, Audio Studios, Contribution and Distribution, Master Control Automation, Asset Management, Video Servers, Non Linear Editing, Quality of Service monitoring and Delivery Analytics. Ted has a passion for aligning market and technology trends. Ted's goal for Qligent is to help Networks, Broadcasters, MVPDs, and infrastructure service providers integrate Quality of Service and modern Delivery Analytic workflows into their organizations more efficiently and cost effectively.

performance data populated through a software program

Most OTT service providers have to date integrated monitoring capabilities with a partnering CDN. While effective to a degree, this approach does not provide the broader scope of delivery nor the feedback loop around QoS and, more



End-to-end OTT Monitoring Architecture: From the core to the edge.

important with OTT, QoE. The intimacy that comes with this burgeoning one-to-one relationship we see between consumers and their mobile devices—service providers get one shot at first impressions, and they have plenty of competition.

Without monitoring and analytics in the delivery and viewer domain, these service providers have little-to-no real insight into the consumer's QoE – and therefore, have no way to ascertain if they are losing viewers, and how to reverse such trends if so. If the service provider fails to deliver on the quality, viewers will turn to a competing service.

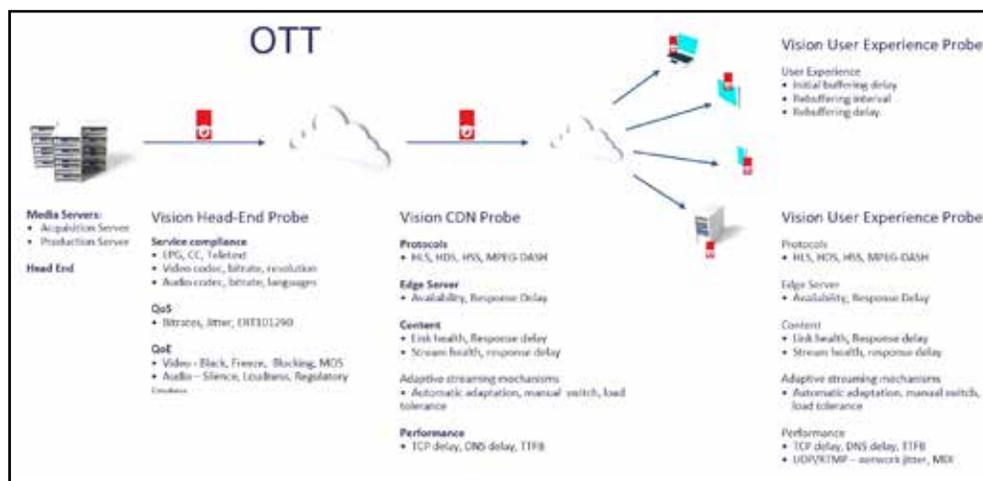
Monitoring and analysis in the cloud, whether handled on-premises or outsourced to a managed service layer focused strictly on those tasks, is the most effective way to minimize churn – and earn repeat viewers.

The Pain Points

By moving to a cloud monitoring and analysis system, OTT service providers can locate and connect probes that monitor all elements of OTT streaming performance. These remote deployed devices measure how well the monitored streams are being received across the distribution and delivery chain, and automatically return that data to a centralized server for cross-correlation and analysis. This means staying on top of service availability issues as they occur via system alerts; or recognition of concerning performance trends through detailed data analysis.

An intelligent – and popular – entry point for many OTT service providers, when it comes to cloud-based monitoring, falls in the compliance category. In a cloud architecture, a software-defined compliance solution is ideal to record content across as many locations as possible. This content can be reviewed and analyzed back at the studio, home or from any location with network connectivity.

The number of monitor points quickly escalate upon approaching the last mile. Just as with any media delivery platform, the last mile is the most challenging to intelligently monitor, analyze and understand. At this stage, deployment of smaller “micro-probes” based on internet



Ensuring quality of experience: Step-by-step OTT monitoring workflow.

of things (IoT) devices – also networked to the central aggregation servers – will provide insight into the usual last mile concerns.

Some key technical benefits of using a reliable cloud monitoring system in any media distribution operation include:

- Full HLS and DASH-IP layer analysis for QoS
- Raw packet capture for deep inspection of packets
- Full transport stream analysis
- Video analysis including high-resolution formats, such as 4K - now proliferating in many OTT consumer services – for QoE analysis
- Analysis of audio layer performance including compliance, quality and language tracks
- Root cause analysis for rapid response of delivery issues

Options Abound

While the rollout of cloud-based monitoring system is fairly simple for an engineer or systems integrator with IT knowledge, these responsibilities can be minimized as more purely virtualized cloud solutions surface. For example, Qligent's Vision-OTT platform is 100% virtualized to eliminate the entire process from hardware procurement and software installation to support and future upgrades.

By using services such as AWS, Azure or Rackspace, OTT service providers can not only leverage that service to deploy, host and manage the monitoring architecture – they also benefit from the highly reliable uptime and redundancy. These services are robust and less prone to failures than a typical IT network in a TV station or video headend, for example.

Another attractive option for many OTT service providers is to offload the actual monitoring, analysis and troubleshooting responsibilities to a managed service provider. These special services can provide continuous offsite monitoring, event-based troubleshooting, incident-based and/or periodic analysis, comprehensive reporting, and recommendations to improve and scale services as warranted. Removing the burden from OTT service providers – particularly those with modest internal resources – can more effectively optimize very widely dispersed OTT distribution and delivery systems that cross borders, continents and oceans.

As more OTT services proliferate, adoption of these cloud-based philosophies and workflows will surely benefit the entire chain from production and processing; to delivery and consumption – with the scalable and versatile toolset needed to really penetrate the enormous signal density of the OTT architecture. □

Storytelling and Production in an OTT World

Interview by Brian Mahony with Barbara Ford Grant, VP of Digital Production Services, HBO

In this interview, Brian continues our Executive Q&A Series on issues and trends in the OTT industry.

Brian: Before we jump into the interview Barbara, can you please provide a quick overview of your role at HBO?

Barbara: My role is VP of Digital Production Services and in that capacity I oversee production and operations internal to HBO including sports, documentaries, series, onsite production, and marketing support. Then we have a production technology group that oversees research and development of software tools for next-generation storytelling methods and anything related to getting the content to the consumer and enhancing their experience. And the third group is the programming acquisitions group who are the people who get content from our theatrical providers and our original programming partners. They do things like captioning and subtitles and things like that. All-in-all what we focus on is content creation all the way through having a finished master ready to hand off to distribution.

Brian: Thanks for that great introduction. So tell us then, how is your job different, let's say in how you enable storytelling, in this new world of over-the-top, multi-channel, multi-device content consumption. How has that changed the nature of your job?

Barbara: The easiest way to explain it is to describe why I am even here at HBO. I came from 20 years in visual effects and feature animation for motion pictures with a focus on computer graphics. So HBO is my first foray into television. I was brought in to look at how we create content and how we manage all the assets that we create and all the valuable IP we are creating-- everything from the scripts, to the costumes, to the set stills--

going beyond what was considered in the television world for a very long time "a tape" of the "air master". From that tape all other derivatives were created and sent out to consumers and that was the end of the story. If you had to re-distribute it you went back to that tape. Now we have this proliferation of thousands and, in the case of shows like Game of Thrones, millions of assets that are used for all different purposes and distributed in all sorts of different ways. Now we have special effects assets, audio assets, sets, stills, promotional content, behind the scenes content, "the making of" documentaries. This includes over 35,000 promotional spots per year as well as numerous internal uses. So there is just an enormous amount of digital files that are used to enhance the consumer experience. In a lot of ways the reason I was brought in is, to steal a phrase from digital animation, to implement the "million files make a frame" methodology. We create content now while anticipating how it is going to be used in different ways. We are seeing this already today in the second-screen stuff and some of the augmented reality (AR) stuff but this is really at this point just scratching the surface.

Brian: I was going to wait to ask about AR but since you brought it up first let's explore that a little. It seems to me that in this new digital world the process of story-telling is much more layered. You have the core story you are producing but then you also have this overlay of other things—interactivity, context around different audiences, different distribution formats, re-purposing for social, and various ways to enhance and promote your content. How is that changing the very nature of storytelling?

Barbara: I think it's hard to predict exactly all the ways it's going to change. People often describe the "two-door adventure"



Barbara Ford Grant is the VP of Digital Production Services for HBO. She oversees internal production and operations; including sports, documentaries, series, on-site production and marketing support. She comes to HBO after a 20-year career in visual effects and feature animation for motion pictures.

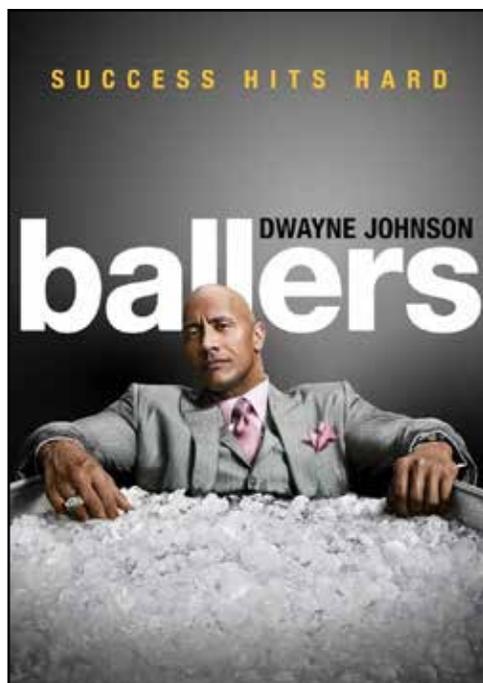
and the mixed reality of real and virtual worlds combined into a dynamic experience. I can see that coming to fruition on the horizon. To answer how it's changed my world you have to look at how we created assets historically for particular end products, things such as an HD master, or theatrical release, or Blu-ray, etc. Now when we create assets we do it in such a way they can be leveraged for many, many different purposes. One example is a laser-scan of a location such as the Washington Monument which we are using as a background in one set. Now we can store this element and add it to our asset library for re-use elsewhere—not just for other shows as a green-screen backdrop but also other experiences such as holographic or VR or as a portable 3D element that can be used in lots of dynamic ways.

Brian: Thanks for that great example, very interesting. That raises a whole set of different issues doesn't it? With all those assets, how do you tag and store all that content, and how do you format and retrieve all that metadata?

Barbara: The job of it is, well, hard... but the governance of it is harder still. Since these elements live in lots of different worlds, managing the governance of them across all their different internal and external uses is difficult. Within my group we have the media management and taxonomy department and there are metadata technicians and people who focus on how we describe and access and normalize the data. The other part of that is connecting to the consumer research folks and the programming research folks and all the ways this data gets used. The question is, what is important to them and how do we capture that and close the loop on that metadata?

Brian: Barbara, this begs the question, are we approaching the point where we are going to have the “haves” and the “have-nots” when it comes to story-telling because the technology requirements are becoming so sophisticated?

Barbara: That’s a good question and I am not sure I’m willing to predict that. But remember, a good story is still a good story. I mean “Moonlight” was not a high-tech film, but it was a really compelling story. The barrier to entry to create something like that is having the



HBO's Ballers benefits from a huge social media fan base.

right group of creative people together. But then there are some animation and VR features that have a super-high barrier to entry that you’re not going to do with your GoPro. So I think there is going to be a vast array of types of story-telling and it keeps broadening. I mean we were blown away when you could watch YouTube, and we were blown away when you could put on a VR headset. So when you think about mixed reality where the viewer can actually participate in the story, that’s where it gets very interesting and that’s where there might be a more narrow band of people who can participate for a little while.

Brian: I agree because it seems to me the art and the science really need to come together the right way. In that regard, how do you avoid the temptation to over-think it or over-engineer it from a production perspective using all these advanced tools and technologies, when they may not actually help the story-telling?

Barbara: It’s really hard because it is so tempting. There are so many shiny things to run after and want to try out. That’s why I am proud of my team at HBO since we don’t always have to chase everything out there. We don’t always have to be first we just have to be best. What I tell my people is we can explore things incrementally—don’t try to recreate the Titanic movie in this new platform today just because we can.

Brian: So I know your group does the promos for HBO shows. Let’s talk about the role of social. Some of the big challenges in the fragmented OTT world are content discovery and viewer engagement. People don’t just channel surf anymore. In what ways can you use social to enhance and promote your content.

Barbara: It’s all about the fan base. I think of a show like “Ballers”. The show itself generated such a huge presence on social media. I don’t want to say there is no one clear strategy but it’s interesting to me when the consumers tell us where they want to see it, and we just have to be very intuitive to where our audience

is. We have this motto that we want to be everywhere where the consumer is. So if there are more of them on Facebook or Snapchat or Instagram for a particular show then that’s where we are.

Brian: Is there anything unique to those formats versus a traditional TV teaser you can use to draw people in on social media?

Barbara: Yes, we use a whole lot of customizations when it comes to social as there are many different file formats to manage. It could even be something as simple as changing the graphics to make the promo stand out better in one platform. Or we might decide to promote something live in one network versus another. We try to use the appropriate tools and style for each platform.

Brian: Just to close I would like to ask you how you think your job is going to change over the next five years due to with some of the changes coming from OTT and the different formats and devices being used by consumers. Do you have any insights or even recommendations for our readers?

Barbara: Well, I think if we focus on the post-production aspect of my job, historically people had to be very broadcast-centric in terms of the technology and the workflow and the ecosystem of digital media. You still need to be very technologically savvy on digital file management, digital data, cloud technology stacks and the ecosystem of digital media, but now you’ve got to go well beyond the simple asset management system. What’s going to change over the next few years is that we are going to move from a set digital distribution model to a sort of a 4D approach to how digital content gets out and gets experienced. And I would expect anyone in this type of role to have a really good sense for the data side of the job in the future as well. □



Case Study

SKY Goes All-In to Deliver World-Class Video Viewing Experiences

By: James Rubin

Every summer evening, football fans around the Balham area of London crowd into The Regent to watch Chelsea, Man U, Sheff Wed or their favorite club square off against a rival on one of the many big screens mounted along the pub's parquet and brick walls. The ale is sharp, the fish and chips crisp, and the quality of the picture on the HD TVs perfect. Life is good – even on a losing night – for those fortunate to get away and join in on the fun.

A few blocks away, in the nearby Tooting Triangle Playground, sit a few young parents, with one eye on their tots and the other on their club's match being streamed –also in HD quality – to their smartphone or tablet. Life – aside from the sleep deprivation and dirty nappies – is pretty good for them, too, thanks in large part to UK broadcaster Sky and its partnership with the quality of experience (QoE) company Conviva.

According to Jeff Webb, Principal Streaming Architect, Sky UK, the mobile

scenario depicted above is pretty much what Sky envisioned when it launched its streaming sports channel Sky Sports Mobile TV.

The year was 2009, and the London-based satellite TV behemoth was sitting on a mountain of original sports content – like Premier League football and ECB – and a huge potential streaming audience consisting of two-thirds of UK's broadcast market.

With Sky Sports Mobile TV, the company looked to tap into the growing popularity of mobile OTT and its subscriber base's rabid appetite for live sports programming. Up to this point, sports content was something that had to be consumed at home or a pub like The Regent.

“What we did as a broadcaster, coming from the satellite world, was breach the gap. We had all this great content, which we spent a lot of money on, on producing and obtaining, and we put it together with our software and engineering



James Rubin is a freelance writer, editor and consultant based in Northern California. He has worked in media and communications for over 20 years and has written about technology and its impact on media and culture for a variety of publications and outlets. As a writer and communications consultant, James has worked with a number of leading tech and media companies, including Monster.com, Comcast, and Informatica, helping them to shape and hone their brand and product messaging and overall communications strategies.



The move to mobile devices has drastically changed viewing habits.

capability, to leverage and maximize it for our customers,” said Webb.

It didn't take long for Sky to realize what it had on its hands with the Sports app, and it soon began to develop similar products for its entertainment, cinema, and news content. It even launched a standalone, pay-as-you-go product, Sky Now, for non-subscribers and cord cutters, and those interested in programming their own content.

Over the next few years, demand for streaming anywhere, anyplace content continued to increase, and in 2011, Sky released its full OTT product Sky Go as an added value for its satellite customers. In the interim, TV viewers were already starting to abandon their old patterns and preferences. Accelerated by the wide availability of affordable TV-ready devices, like game consoles,

tablets and streaming set-top boxes, and higher quality screens and faster microprocessors, linear prime and family TV time was being replaced by “device” time, which could take place anywhere at anytime.

By 2015, 75 percent of Sky’s 11 million UK broadcast customers were availing themselves of the OTT service, and the scope of trying to maintain the quality for that many streams was starting to become a problem.

Broadcast quality had always been a priority for the satellite service, so when Sky launched its OTT offering, it wanted similarly to use the quality of the viewing experience as a way to distinguish itself.

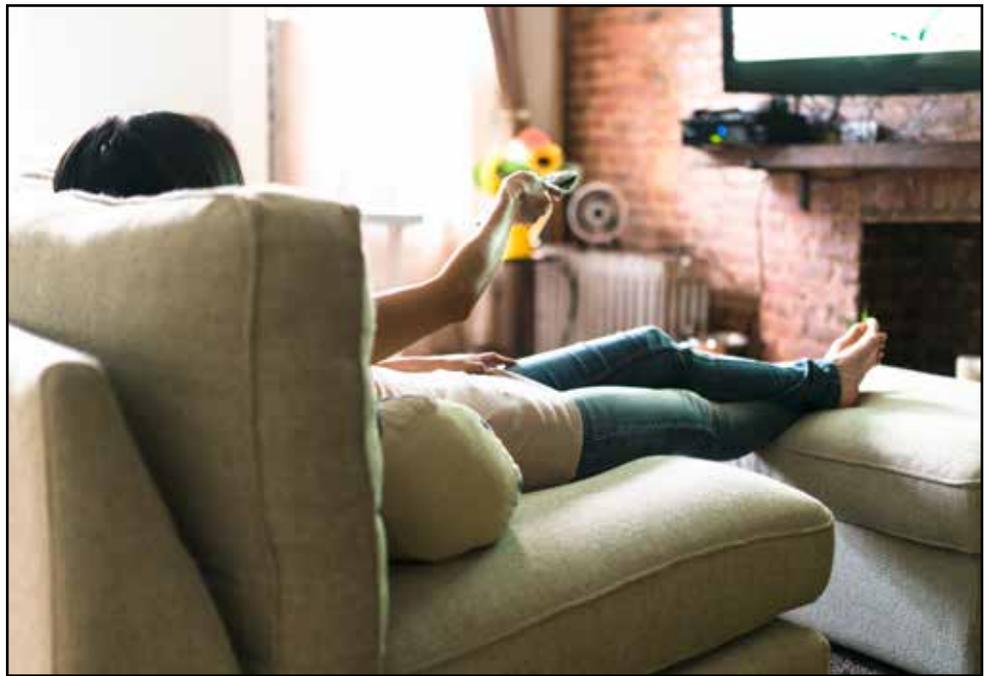
Delivering Video Over the Internet Is Difficult

A great part of the problem with delivering video over the internet is the internet itself, which, it turns out, was not really made for video. Adding to the problem is the issue of control, as in OTT publishers have very little of it. Unlike with its satellite broadcasts, Sky is extremely reliant on a number of 3rd-parties, such as content delivery networks (CDNs) and internet service providers (ISPs) for the quality of its experience.

But the typical viewer doesn’t really care about any of that. By now, all have experienced 4K video and expect the same level of HD quality from all of their streams. As a result, QoE and content have become key differentiators to providing customers with an enjoyable viewing experience and reducing churn.



The goal of quality management tools is to make consumers forget they are there.



Nothing destroys viewing enjoyment like poor streaming quality.

From the beginning, Sky had been working with its CDN partners to resolve traffic overloading and other issues affecting quality. Most if not all of the major problems were occurring at peak viewing times, when traffic for a single program, like a football match, could reach 500K to 750K streams. “As a large broadcaster, we have lots of customers wanting to watch the same content at the same time, and we were regularly breaking CDNs and having issues,” recalled Webb.

Even the largest CDNs are susceptible to overloading, especially at times of peak traffic, like when Sky is simultaneously broadcasting a big football match and an event like a *Game of Thrones* premiere. To alleviate the load, publishers like Sky use multiple CDNs, so, when an issue occurs, they can transfer or switch the traffic from one CDN to another and back, without the viewer ever knowing. But switching traffic to and from multiple

CDNs is just about as complex as delivering video itself, and in 2015 Sky looked to Conviva for help.

Unless they received a call to customer service or picked up a complaint on social media, Sky had very little insight into what was going on with the viewer at the other end of the stream. Conviva provides OTT publishers with tools to measure viewer experience and engagement. Experience metrics give publishers visibility into what is happening on the viewer’s device – did the video load quickly or was their lag time. Engagement captures the viewer’s behavior – did they log off or switch programs. Conviva’s specialty is correlating the two and using machine learning to predict problem areas and how viewers will respond to them.

With Conviva’s help, Sky now had visibility into the viewers’ experience and the multidimensional factors – such as bit rate, buffering, and video start times – affecting the quality of its broadcasts. It could also tell how that experience was affecting engagement.

Like everyone in the industry, Sky understood how important buffering was to viewer experience and engagement. It was well aware of the 1% rule, which is what the industry had established as the highest rebuffering rate viewers will tolerate before heading for the exit. But with the analytics it was getting

from Conviva, a different picture was beginning to emerge. Instead of the 1% threshold, Sky was seeing a significant engagement drop off at the much lower rebuffering rate of 0.4% (rebuffering rate is the percentage of total viewing time spent buffering vs. streaming content).

At about the same time, Sky was also wrestling with how to better manage the switching between CDNs. Up to this point, switching decisions were being handled manually and based on statistics it was getting from its CDN partners.

“We assumed it was working because we’d be looking at the CDN statistics on the monitor and the traffic delta was in the ballpark, but then we’d get an outage, and so, clearly, what we thought was working wasn’t,” said Webb.

Without a way to automatically detect issues and switch and balance traffic between CDNs, Sky would continue to break sessions and provide affected viewers with a poor experience.

Solving Multi-CDN Switching

The discovery of the .4% threshold led them to a way forward. Sky was already using the data and analytics provided by Conviva to identify and diagnose quality issues. What if they could take that data, put some business rules around it and use it to automatically inform and direct the CDN switching decisions? It was definitely within the realm of possibility. They just needed to find a platform to implement it. In the end, they didn’t have to go that far to find it.

As fate would have it, Conviva was working on a similar problem at the time and had come up with an API-based solution that could potentially work. More development was needed, but there was enough there for Sky to select Conviva for the project.

The decision has paid off so far. Now when a viewer starts a stream, Sky’s content management system (CMS) automatically selects the best CDN for that specific session. And when an issue is detected, the session is quickly restarted on another CDN.

The solution uses Conviva’s QoE analytics and its Precision API to make recommendations on CDN switching based on Sky’s business rules around

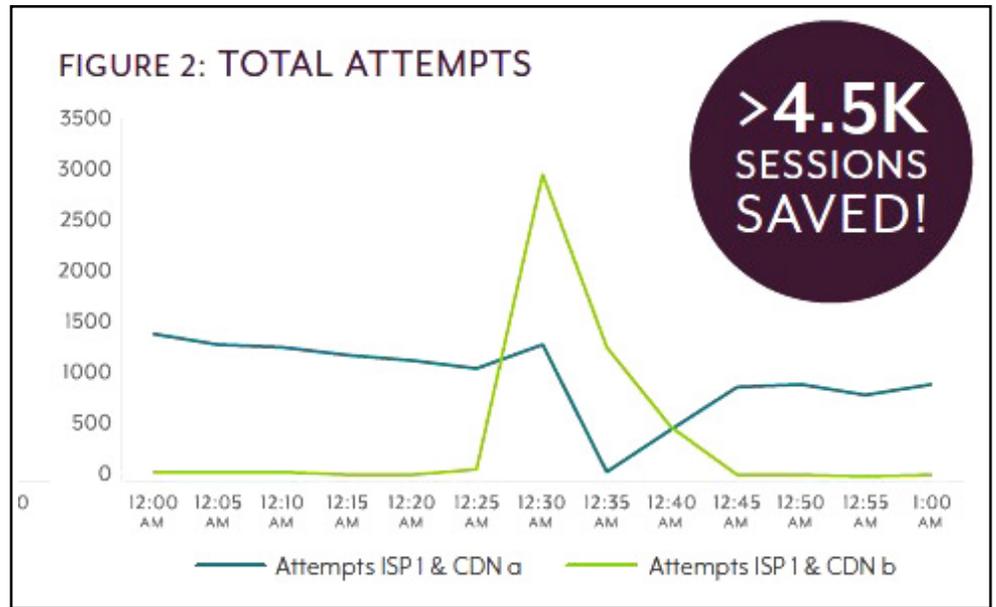


Figure 2: Shows the benefit of multi-CDN switching solution.

quality and cost. Connections between Conviva and Sky’s technology stack are made via API, and each recommended stream session is captured and displayed on Conviva’s Insights dashboard for Sky’s engineers to monitor and correlate. Recommendations are also correlated with the results by the machine learning system to increase its accuracy.

The result of the partnership earned the two companies a nomination for a TV Connect Award, but, more importantly, it’s enabled Sky to provide subscribers with the consistently excellent experience they expect.

This came into play recently, when the automatic switching technology saved the day for close to 5,000 viewers. In this instance, the system detected a 100x spike in re-buffering on one of its CDNs, causing numerous sessions to end. With the Precision API, the fault was detected almost immediately, and the sessions were automatically switched over to a CDN that was performing well. All this occurred within a 10-minute period, which highlights the importance of real-time data and decisioning to maximizing the consumer video viewing experience (see Figure 2).

With the success of its multi-CDN switching solution barely in the rearview mirror, Sky is already looking for new ways to push the envelope – and industry – on OTT quality. One way they’re doing

that is through a new partnership with Conviva that will potentially provide the industry with objective metrics, like those provided by the media research companies Nielsen and comScore, which consumers can then use to compare OTT publishers when making purchasing decisions.

Whatever Sky does next, it will most likely involve keeping life good for its 8-million+ streaming customers. As Webb said, “The future is in streaming, and you can’t really put a satellite dish on the roof of your car or phone, but you can put the software on your device and stream the content to the car, or wherever else you go.” □

OVER THE TOP VIDEO

A great way to generate visibility for your brand is to engage with our 40,000+ OTT Executive community. Our content marketing programs— including white paper promotions, webinars, and social media campaigns— build brand awareness and generate qualified leads at the same time. In addition to promoting to our network through email, social, and digital properties, your content marketing program will typically enjoy over a million potential impressions through other social media channels. Furthermore, your asset will be backed by our guidance in its creation and our advocacy throughout promotion.*

White Paper Promotion

- Dedicated week of promotion and advocacy
- Landing page and lead capture form hosted by sponsor
- Promotion through “OTT Video” and other LinkedIn groups
- Tweet campaign via @OTTExec and @BrianMahony
- Blog post on TrenderResearch.com and LinkedIn Pulse
- Total potential impressions: 500,000-1.5 million
- Expected leads 100-200 (based on past programs)

Webinar Program

- Four-six weeks of promotion and advocacy
- Landing page and lead capture form hosted by Trender Research
- Promotion through “OTT Video” and other LinkedIn groups
- Tweet campaign via @OTTExec and @BrianMahony
- Blog post on TrenderResearch.com and LinkedIn Pulse
- Total potential impressions: 500,000-1.5 million
- Expected leads 50-100 (based on similar programs)

More information:

Andrea Chambers, Business Development Manager,
achambers@ottexec.com

** Trender Research reserves the right to edit, or decline, assets that are poorly crafted, overly promotional, or uninformative.*



Niche Content Finds a Global Audience

Interview by Brian Mahony with David Mendels, CEO of Brightcove

In this interview, Brian continues our Executive Q&A Series on issues and trends in the OTT industry.

Brian: Thank you for joining us for our executive Q&A series. Let's get started with a quick background on yourself and perhaps some of the initiatives for Brightcove this year?

David: Sure, thanks Brian. I'm the CEO of Brightcove and I've been with the company for nine years and I love it. Prior to that I was with Macromedia and Adobe for 16 years and was responsible, among other things, for the business around Flash. That led me, 15 or so years ago, to get excited about online video. It's really been an incredible explosion and opportunity for a lot of people. We are the leading company in the states. We provide technology to help business of all kinds build online video business and OTT services. We service some of the largest and most sophisticated consumer paid OTT services in the world. We also service some small niche companies and organizations that want to go to market direct to consumers with an OTT service. So we can scale up and down for different kinds of customers.

Brian: What about initiatives this year? What do you see new happening and where are the new opportunities for Brightcove?

David: I feel that right now we are at a really exciting tipping point in terms of how technology can increase the quality of experience, decrease the cost of delivery, and enable OTT services to thrive in a competitive environment. If you think back over the last five years, we had this incredible evolution of technology where people went from Flash to Flash HTML to Android and Roku and Chromecast and AppleTV and so on, and it's been a complicated technical

problem to deliver a great service across all of these devices with security, with monetization, with recommendations and so forth. I think right now we are at a tipping point where we are able to bring innovation and technology together to help a company launch an OTT service at a radically lower cost, a radically faster time to market than what was possible a few years ago. That's enabling these services to launch and it's really exciting.

Brian: Congratulations on your success. Let's talk about the industry now. How would you define over the top video and where do you see the biggest challenges towards full adoption in the industry?

David: OTT certainly means different things to different people in different geographies, but the simplest way to think about it is a direct to consumer service across multiple consumer devices using the internet to deliver video content. This is typically delivered to a subscription model and in some cases a hybrid model of subscription and advertising.

To date, it's been expensive and complicated to build a great OTT service that works across multiple devices and delivers a first-class viewing experience. We are changing that. I think one part of the problem is that it's been expensive. If you are Netflix or Hulu and you have hundreds and hundreds of engineers, you can do an amazing job; but for a lot of entities it has been out of reach to deliver that kind of experience. We are at a point where the economics are changing, the technology is changing to enable people to economically, efficiently deliver these great services. That's point one.

Point two is that we are still in a hockey-stick of adoption in terms of consumers moving their preferences from watching traditional broadcasts to internet-delivered video and adopting living room devices, whether it's AppleTV or Chromecast or Roku or a number of



David Mendels, CEO of BrightCove, brings nearly two decades of experience as a general manager, corporate strategist, thought leader, and deal maker focused on making the Internet easier to use for consumers and developers. Mendels is a recognized leader in the development and strategies behind rich Internet applications. At Macromedia, Mendels served as executive vice president and general manager, leading product development, marketing, and alliances including the setup and launch of international operations in Latin America and Japan. Mendels joined Adobe following its acquisition of Macromedia in December 2005 and led the company's Business Productivity business unit where he was responsible for \$1 billion in revenue from products including Adobe Acrobat(TM), Acrobat Connect(TM), LiveCycle and Flex.

others, and that will keep moving. I think we are past the early adopter phase but still in a period of rapid adoption. So, first it has to be economically possible to create and deliver a great experience. Secondly, consumers have to want those great experiences. How do you get mind-share? If you are not a big global, general service like Netflix— say you are a niche service and you are doing your best to put your content online, for example Acorn TV— then you have to have an angle or something that is unique about you like providing an experience or content that is great. If you can do that, if you have content that is great, and you have your own angle for how you deliver that

content and who you deliver it to, then everything else comes together.

Brian: In your mind, what are some best practices for choosing and packaging content for your target demographic? What are some things you can do as a platform to help customers with that workflow? How is it different from a more traditional approach?

David: For every consumer service out there, every consumer product out there, the core of the question is does it have a reason for being, a soul? The beauty of doing internet delivered content is that you can create a business out of what otherwise would have been a considered unprofitable niche and you can make a large business out of it because you can reach viewers worldwide. But only if you have clarity of vision of what you're trying to do. I think Acorn TV would be an example, and there are smaller niches as well. One of our customers delivers Asian content to the Brazilian market. It's not a huge market relative to some of the name brands we all think about, but there is a powerful niche there and you can aggregate a lot of business by having a focus. I think that focus is important, and there isn't really any rule of thumb. Sometimes with a niche offering, the audience is passionate and willing to pay to get access to content that they couldn't otherwise get. With the technology that is available today, they can deliver a phenomenal experience. Those are just a couple of examples, but the key is focus.

The second part of the question, what are we doing to help. If you are a company that has an audience, that has content then you need to focus on what you are good at. You need to focus on curating, creating and delivering that content. What we do is make the technology transparent. In the first ten years of OTT, going back to about 2005, everyone that wanted to do this had to be a technology and a content expert. I think we are changing that and saying you don't need to be anymore. We can provide you with

the platform that just works and makes it easy, you can launch that, you don't need to hire a big tactical team. It lets everybody do what they are best at. We deliver video over the internet at a scale that almost no one in the world does—250 years of video every 24 hours. You, company A, B, C, have expertise, whether it's opera or British TV or animation, but you get to focus on your content, your audience and not have to worry about the technology staff in the same way people did over the first ten years. It's a huge second-mover advantage for people that want to launch today.

Brian: How is content different in the OTT world? What are the major challenges of being able to view different forms of content across multiplatform devices and even in different modes from live, VOD, to download-to-own, whatever it might be?

David: First, I think the biggest difference in content is that in a one-to-many mass broadcast world, you have to appeal to the lowest common denominator and there is no economic market for most niche content. In a world where you can use the internet to target an audience that might be very large but dispersed, you now have an economic story to have really high quality niche content that couldn't happen before. It creates an opportunity for a whole new channel, whole new types of content that could not have existed in a mass broadcast world. Secondly, there are new forms of content in terms of technology coming out that are becoming easier and easier to deliver. Video-on-demand, live and linear channels, custom 24/7 channels, etc. We are also really excited about some of these emerging categories- 3D video, AR/VR that we are enabling as well. We see a wide range of use cases for that where people want create new experiences and share them in new ways.

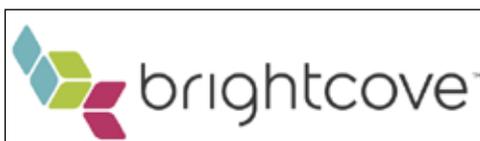
Brian: I imagine this puts more pressure on your content management system. You have to create the right content, in the right format for the right audience and make it available to them where and how they want to watch it. It puts more pressure on analytics and

understanding who is watching what and where. How can you help customers with that challenge?

David: That is the core of what we have done. We've spent the last three years building a new generation of video delivery technology that replaces a lot of the complexity of exactly what you are talking about—delivering to all these different devices with an elegant software solution. We are taking something that used to be brute force and turning it into software. We are using machine learning, we're using a whole bunch of things to make it much, much easier for anybody to deliver a service that goes to all these devices, in the right format, with the right security, in a way that wasn't possible without in the past. That technical innovation paves the way for everything we are doing right now.

Brian: If you look in your crystal ball over the next five years, how do you see the OTT industry evolving?

David: The trend to consuming video on mobile and living room devices that are connected to the internet is an unstoppable force. Whether it's in five years or not, it will be the end of traditionally delivered video and basically everything is coming online and over the internet. The second thing is we will see a continued proliferation of high quality consumer devices that enable you to have incredible experiences with IP delivered video. Third, I think we going to see a lot more traditional TV and video to come online. You have to see some technical breakthroughs and some infrastructure breakthroughs that will enable that to happen at the scale necessary and at a cost that will work for both content owners and for consumers. We've seen some, and we are bringing some to the market this year, and I think we are going to see many more technical breakthroughs over the next five years that enable this whole ecosystem to thrive on a much greater level. □





Don't Leave Users Adrift in a Perfect Storm

By: Ben McAllister

Users are snowed in with content and options to consume it. Not only is there increasing adoption of OTT delivery options every quarter, every option comes with its own way of enabling discovery in a centralized way. Users have multiple paths to discovering content, including a device-wide search functionality, search within an app, and links formed by cross-referencing data points in content metadata. For example, a link in a recently-watched stream of Joe Dirt might lead a user to other works by David Spade.

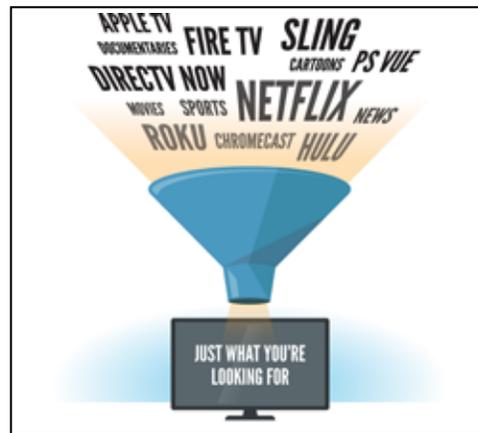
Content providers can't afford to kick back and just build an app — they can do more.

As access to content increases through the rise of OTT options from Apple, Roku, Google, and Microsoft, providers should look hard to make the most of emerging content discovery paths, and know that each platform has unique implementation details. Tailoring app features, as well as publishing workflow, makes the most of discovery opportunities.

With the fourth generation AppleTV, Apple announced Universal Search and now the TV App. Shipping with five search partners initially¹, the list has grown to more than 50 in the US² at the time of writing. Becoming a partner on tvOS, in this case, means a partnership

agreement with Apple similar to what's currently supported on iOS. Through a combination of a Universal Links feed client-side development work, providers can ensure their content is visible to Apple's AppleBot webcrawler, and therefore through Universal Search.

Joining a partnership program and exposing a proprietary feed is also standard practice on Android, Roku, and



Taking a hard look at discovery opportunities in a content heavy world.

others. Since each path to delivery has a proprietary development as well as a proprietary metadata management piece, investing in development and publishing workflow is required to truly leverage both.

Content providers should keep these tactics in mind when considering the state of OTT device adoption. In Q1 2017, Nielsen reports³ significant growth in adoption of streaming media devices as well as continued adoption of gaming consoles, which remain the long pole⁴ for OTT consumption. Steady increase in user adoption of these paths to content discovery equate to quick ROI for providers willing to



Ben McAllister is Director of Engineering at L4 Digital, a digital product agency based in Seattle with a rich portfolio of high quality, award-winning solutions in the media and entertainment space.

make the investment. Failure to invest in this custom work often means giving up control of the content discovery experience to the device manufacturer, but the manufacturer is motivated to keep customers' eyes on their platform experience rather than individual content providers.

Strategic exposure of content within proprietary walled gardens requires a cursory investment in publishing workflow and custom software development. Publishers must commit to providing content metadata according to proprietary guidelines, as well as custom development time to ensure the user's experience is maintained from outside-the-app search through consumption within the publisher's application. The rewards are audiences that experience less friction and more relevance in discovery as they surf the vast content now within their reach. □

Footnotes:

1. <https://www.buzzfeed.com/johnpaczkowski/tim-cook-talks-apple-tv>
2. <https://support.apple.com/en-us/HT205321>
3. <http://www.nielsen.com/us/en/insights/news/2017/tv-connected-devices-pave-the-way-for-new-ways-to-watch-content.html>
4. <http://www.multichannel.com/news/content/gaming-consoles-still-top-ott-video-conduit/395088>



The proliferation of devices has exacerbated the content discovery challenge.



Executive Insights

The Powerful Combination of Mobile and OTT

By: Brian Handy

As the internet, mobile, and digital landscape continue to evolve, we see an explosion of data occurring. Look no further than “what happens in an internet minute” and prepare to be stunned with the vast amounts of data published and shared.

Driving much of this rapid increase in data is the smartphone. According to Pew Research, 77% of Americans now own a smartphone— including 92% of 18-29 year olds.

Of course, data by itself is meaningless. Only data that has been collected, analyzed, and made actionable is valuable. Mobile’s most powerful feature, and still slightly unsung hero, is location data. While the “cookie” has powered the desktop web for a solid generation, location data is proving itself to be the physical equivalent of a cookie in mobile. By measuring where a device visits in the real world, smart marketers build highly accurate and relevant audiences

that measure true intent, behaviors, and interests.

As the mobile industry matures, it’s getting better about being able to port its valuable data to other platforms. This is where we begin to see mobile and OTT combine.

Only data that has been collected, analyzed, and made actionable is valuable.

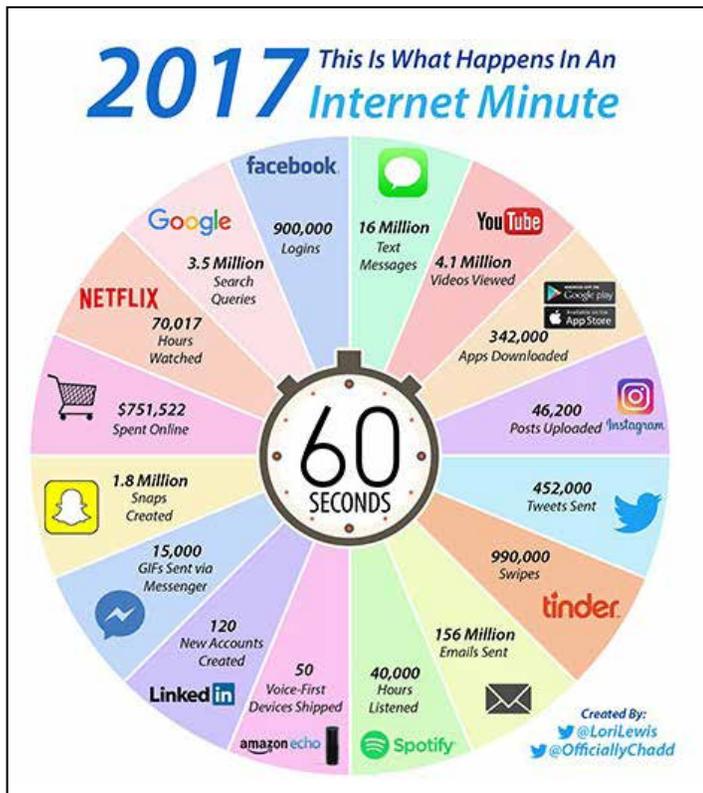
There exists an untapped opportunity to marry this real-world location behavior with OTT viewing. Though no simple feat to get right, matching a mobile device to a smart TV is possible, with one approach being via IP address matching. By evaluating the home IP of a smartphone and that of the TV, marketers start to link these devices together.

Once this link is established, OTT advertisers can now perform mass customization of advertising. They can build audiences of everyone who visits their locations, their competitive locations, or find people that live and work nearby. The auto dealer can reach viewers who not only live nearby, but also those that have visited a dealer lot in the last 30 days. That auto dealer can also reach someone who hasn’t visited a service center in the last 90 days, and who works nearby, in order to drive the early morning or lunch-time oil changes.

Ultimately this boils down to a cross device discussion.



Brian Handy, CEO of Reveal Mobile, possesses more than 20 years of technical, operational and executive management experience, with 18 years of that in advertising technology. Brian was co-founder and CEO of Accipiter, which was acquired in 2006. Before their recent acquisition, Handy served on the Board of Directors for WebAssign, and currently serves as an Operating Partner for Frontier Capital. Brian also has extensive experience as an angel investor and is an active advisor for several North Carolina technology companies.



Exploding—every minute millions of data transactions are recorded on the internet.

Whether it be mobile location data, desktop cookie derived data, purchase data, or social data, matching known data from other devices creates a powerful opportunity for the OTT industry.

As the scale of OTT viewing continues to increase, along with the sophistication of audience targeting against audience data rather than content, we’ll see increasing advertiser interest over the coming years. Targeting against content will always have a place, but the true opportunity lies in using audience data down to the household and personal level. The companies, brands, and marketers that are able to take advantage of this now will leapfrog their peers. □

Blink Now: Bridging Business Decisions with Viewers' Desires

By: Jonas Flodh

Blink Now, a leading premium OTT provider based in the Philippines, was preparing to expand beyond its extensive VOD library of TV series and Hollywood films, to offer live event broadcasts. But it was facing a challenge common to OTT providers across the globe: it needed greater audience insights to drive revenue across multiple OTT business models.

Blink Now holds a highly visible position within its home country. The company is a unit of SM Lifestyle Entertainment (SMLEI), the entertainment arm subsidiary of the Philippines' largest property developer, SM Prime Holdings.

The challenge is an increasingly common, yet new phenomenon for OTT providers—what's the best way to monetize video content? Particularly in a country where economics between social classes range widely. Blink Now launched three separate business models in order to make content accessible, both digitally and financially, across the country, including a

subscription-video-on-demand (SVOD), transaction-based-video-on-demand (TVOD) and free-to-access, ad-supported video-on-demand (AVOD).

To meet its objectives, Blink Now required a sophisticated video technology provider with a powerful analytics solution – one that could help it understand its audience's habits across all its video services.

In particular, Blink Now needed to understand which service is helping grow its business, requiring analytics such as content views, trends and subscriber engagement. This is all to improve the customer experience and interaction and, more pointedly, to propel its business.

Blink Now teamed up with Ooyala, seeking to leverage Ooyala's data-driven platforms in order to enable audience insights throughout Blink Now's video businesses.

Blink Now needed to stream live events such as the Miss Universe 2017 pageant, held in January 2017 at the Mall



Jonas Flodh is the Vice President of Products at Ooyala, overseeing technology innovation for the company's complete set of Integrated Video Platform solutions. Previously, he was the Chief Product Officer of Videoplaza and the Chief Technology Officer and Vice President of TradeDoublar.

of Asia Arena in Manila.

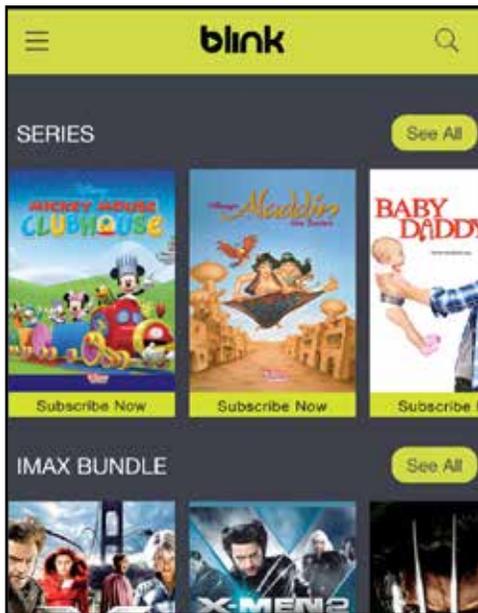
Blink Now also needed up-to-the-minute analytics that enable it to understand what content is trending at any given time. This allowed them to tailor their offerings to feature well-performing content, to attract ever-expanding viewership.

Real-time multi-dimensional reports give the company granular insights in order to track engagement over any period of time across all properties, or even individual videos. The data helps ensure that Blink Now is reinvesting in highly-profitable content for the business, based on viewing behaviors.

Using an advanced advertising technology platform, Ooyala Pulse, Blink Now can see how ad load and total ad-length affects content drop-off and completion rates. This insight allows the company to tailor the right amount of ads to every piece of content – optimizing the content-and-ad mix and allowing Blink Now to maximize content monetization without sacrificing user experience.



Blink Now teamed with Ooyala to build an end-to-end OTT platform.



Sample of movies available on Blink.

“Supporting multiple TV monetization models demands rich data to guide decisions,” said SMLEI assistant vice president of digital media and Head, Francis Gerard R. Tupaz.

Blink Now is the latest great example of a modern entertainment customer in need of Integrated Video Platform solutions. Blink Now can grow in tandem with its audience’s appetite for video, and with the industry. The provider has insights to see the different ways in which audiences watch Hollywood titles versus globally recognized TV episodes, as well as what content is driving them the most money and how its audiences prefer to pay for and access content across devices.

Blink Now is maximizing its business potential across three separate OTT

properties with a single provider — powering ad operations, video delivery, data-driven insights and live streaming to more than 180,000 users nationwide. □



Congratulations to our past OTT Executive Summit winners!



1st Place



2nd Place



3rd Place

Past Winners:

NYC 2016

- “OTT Genius” — Kurt Michel, IneoQuest
- “OTT Hero” — Don Wilcox, PBS
- “OTT Guru” — Roger Keating, Hearst Television

NYC 2015

- “OTT Genius” — Brian Balthazar, Scripps Networks
- “OTT Hero” — Rich Antoniello, Complex
- “OTT Guru” — Rick Howe, The iTV Doctor

NYC 2014

- “OTT Genius” — Jean-Michel Planche, Witbe
- “OTT Hero” — Amit Ziv, EPIX
- “OTT Guru” — Steve Harnsberger, OTT Digital Services

Boston 2014

- “OTT Genius” — James Norman, Pilotly
- “OTT Hero” — Jim Turner, Net2TV
- “OTT Guru” — (Tie) Gabriel Dusil, Visual Unity; and Jason Thibeault, Limelight Networks



✓ Best Practices

A How-to Guide: Installing Application Development Builds on OTT Devices

By: Greg Molyneux

When a company launches a new mobile/OTT app, it is very important that the mobile/OTT app works properly. This may sound simple, but you would be surprised how many issues arise during the development of a mobile/OTT app.

As a digital analyst, I am often tasked with providing quality assurance for the development builds of my clients' new apps, which includes testing their functionality and data collection. Doing a quality assurance check of an app before launching is vital to the success of the app.

If data is missing or if an essential part of an app is not functioning correctly, it might negatively affect their ability to plan effective advertising and marketing campaigns. I currently work with two large media companies that collect vast amounts of data. It is very important in my day-to-day work to have processes in place that allow me to QA all their apps in their latest development builds.

Getting the build for mobile apps is typically easier than for OTT devices because there is a centralized way for developers to provide the individuals doing the testing, or the testers, with access to dev builds. Using Test Flight (for testing over the air installation and mobile applications) or The Hockey App (a mobile crash analytics and app distribution service) a developer can provide a tester access to their builds through their accounts. Testers can then sign in to their account and download a development version of the app to the appropriate mobile devices.

But the emergence of OTT devices has created a unique challenge in the QA process. The process of placing a development build on OTT devices is often more complicated than for mobile devices. Below I have provided tips for testers to put development builds on four different OTT devices, along with some tips to make the testing process for OTT devices easier.



Greg Molyneux, Data Analyst at Maass Media, is experienced in both Google Analytics and Adobe Analytics; specializing in web site audits, data reporting, dashboarding and data analysis. Prior to nearly a decade as a Content Manager for several media websites, Greg graduated from Rowan University with degree in Law and Justice, and Widener University School of Law in 2003 with the degree of Juris Doctorate.

Installation Tips

Apple TV

For QA on Apple TV (fourth generation or older) TestFlight is available to distribute development builds to testers. Developers may invite up to 25 internal testers within their organization, as well as 2,000 external testers outside their organization.

When a tester is invited to test via TestFlight, they can download the development app onto their device via the free TestFlight app. Apps uploaded to TestFlight are available to invited testers for 90 days. TestFlight offers developers the ability to track tester engagement and app performance by viewing the build status metrics in iTunes Connect. TestFlight also gives developers the opportunity to get email feedback from testers through a preset feedback email.

Roku

To download a development app onto



Application integration is one of the biggest challenges for deploying and maintaining an OTT service.

a Roku device, the device must be first set to development mode. Next, the tester will need to have access to a development build in file form.

After obtaining the development build, the tester will need to determine the IP address of the Roku device they will be using to perform the QA. Finding the IP address is as simple as going to the settings of the Roku device and looking under

message will appear in the command prompt.

Once the development build is installed onto the Fire TV device it can be accessed via Settings > Applications > Manage Installed Applications.

Chromecast

Chromecast is unique to OTT devices because a development build does not have

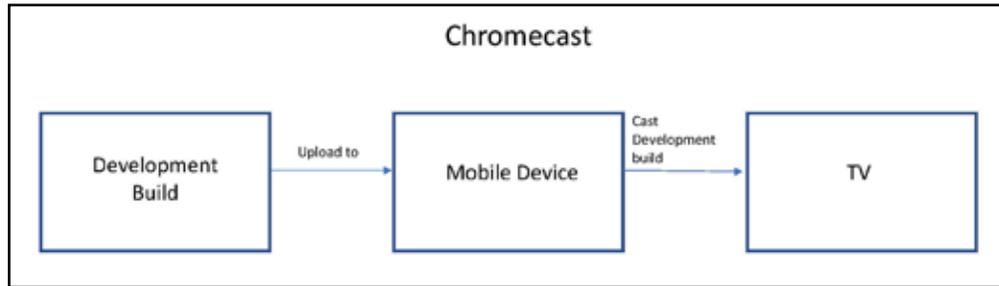
is not already installed on the OTT device. On certain OTT devices, a new version of a development app will not overwrite the app currently on the device causing errors during the installation process. Not all devices and installation processes make it clear why these errors are occurring, leading to large amounts of time wasted.

The tester should have access to the most recent development build in TestFlight and the Hockey app. If clients don't provide the most recent builds, a tester can perform an intensive QA on wrong build, wasting a lot of time. They will always want to ensure they have and know the name of the latest development build prior to beginning a QA.

The tester should also know the specifications of the app they are testing, so that they understand what they are supposed to see during the testing process. Still, I often get a request to QA a build without receiving specs for functionality or analytics. When specifications are not available, the tester can compare the analytics and functionality to the app that is currently in production.

Conclusion

In 2016, more than 70% of US households streamed at least one OTT service. With trends indicating an increase in usage for 2017, it is essential that apps on these devices both work properly and collect the correct data. Without processes in place for proper QA, it will be difficult to collect the data you need to launch successful marketing and advertising campaigns. □



the “player info” section. The tester will also need to ensure both the computer and the Roku are on the same network. Then, they will open a browser on their computer and enter the IP address of the Roku: <http://rokuPlayer-ip-address> (i.e. <http://192.168.1.100/>)

When the screen opens, they can click the browse button and proceed to the location of the development build file. Then, they'll select the file and click install. A success screen will appear and the file should install and begin playing immediately.

Fire TV

Fire TV created the most intricate method of downloading and installing development builds. To begin, a tester would install a copy of Android Debug Bridge onto a computer. Next, they should open a command prompt and enter the command “ADB connect” followed by the Fire TV IP address. The Fire TV IP address can be found under settings > system > about on the Fire TV device. Once connected, a message will appear in the command prompt indicating connection.

After they are connected, they will need enter command “ADB Install” followed by the .apk file path of the development build that resides on the computer.

As an example, the file path could be as follows C:\Users\Admin\Downloads\client-0112.apk. If the file is successfully installed onto the Fire Stick, a success

message will appear in the command prompt. The development build lives on the device from which a user is casting, such as an iPhone or Android tablet. This makes the functional QA of Chromecast straightforward. One can download the development build on a device, cast and QA.

When it comes to performing a full QA of all data collected or passed by the Chromecast device, it is required that the Chromecast device be registered as a developer's device. This can be done online through the Google Cast SDK Developer Console. The Developer console also supplies a step-by-step process of debugging a Chromecast device.

With trends indicating an increase in usage for 2017, it is essential that apps on these devices both work properly and collect the correct data.

QA Tips

Always ensure the computer and device are on the same network. A tester may have multiple wireless networks at their disposal at any given time. They should not forget to check that the OTT device is on the same wireless network as the computer they are using. This will cause errors during installation.

Make sure an older version of the app



Less is More with OTT Services

By: Shane Cannon

CNBC ran an interesting story in the fall that indicated that the intent to cut the cord over the next 12 months was at an all-time high. Nine percent of millennials indicated they were “very likely” to cut the cord. The reason might surprise you, it wasn’t all about cost. Rather, respondents were indicating they were satisfied by getting the content they wanted via over the top services like Netflix or Hulu. Perhaps most interestingly, respondents to the survey indicated their desire to try a “skinny bundle”.

This all supports the narrative that people are really rethinking their pay TV subscription. While I don’t agree it’s as high as some articles and analysts may suggest, it’s fair to argue cord cutting and skinny bundles are a legitimate trend in the marketplace. Cable, Satellite, and OTT companies should seriously rethink their big bundle strategy or risk irrelevance.

“We saw 52 percent of the respondents that pay for TV saying they want to do a skinny bundle” Magid Advisors president Mike Vorhaus told CNBC.

Customers now watch shows, not channels. TV is already undergoing one of the most radical transformations in history. How they consume content has already seriously changed. The consumer is more empowered than ever to select and watch the content they desire without surfing through hundreds of channels they never watch. Thanks to companies like Netflix, satellite, and cable customers now are all used to watching on demand content in some shape or form. More importantly consumers are used to watching shows on their Laptop, Tablet, Smart Phone, or Smart Televisions in or outside the home.

The pay TV industry is clearly losing subscribers, especially the past year. Who can argue it’s not due to dissatisfaction with the big bundle of channels they never watch? Pay-TV providers are feeling the pressure to slim their channel offerings and tailor packages to subscribers.

How many friends of yours have done a bit of Cord Shaving (reducing their pay TV package down to a cheaper plan) because they just don’t watch the big bundle of channels they are paying for? It’s difficult to argue that skinny bundles aren’t a legitimate trend that is here to stay.

According to Nielsen’s Advertising & Audiences Report, the average U.S. TV home now receives 189 TV channels—a record high and significant jump since 2008, when the average home received 129 channels. Despite this increase, however, consumers have consistently tuned in to an average of just 17 channels. Do we really need all those channels?

Consumers ask themselves each month why they are paying for large bundles of channels they never watch. Most of the new companies entering the OTT marketplace are making the same mistakes as cable and satellite. If customers are truly only watching an average of 17 channels per month, is paying for 60, 80, 100, or 120 channels what the market really demands? Thus far the OTT companies are still making the mistake of



Skinny bundles are best when targeting specific demographics.

lumping in too many unwatched channels with one potential exception of Sling TV. Why keep the big bundle concept with 60+ channels at a minimum for stream-



As Chief Marketing Officer, Shane Cannon has helped VIDGO secure Sales & Marketing Agreements for 24 strategic partners the past 4 years. He oversees Marketing, Call Center, Direct Sales, Indirect Sales, and strategic acquisition programs. He was personally instrumental in helping VIDGO raise over \$10 million from Angel Investors. Shane is an Entrepreneur, successfully founding 3 start up companies that acquired over 175,000 customers for National Brands including AT&T, DIRECTV, Dish Network, and the major cable operators.

ing if the average customer only watches 17? They are assuming the market still wants a more channels than they watch if the price is lower. This isn’t far enough.

Skinny Bundle (n): A pay-television package with a slim number of channels.

There isn’t a checklist of qualifications for what defines a television package as a “skinny bundle”—that’s still up in the air. But I would argue it’s 15-20 channels at most. So, what channels are truly ideal in skinny bundles? The data is there and more accessible than ever that shows which channels consumers really watch.

But can you be too skinny? The answer is yes.

We have done polls and surveys from our 50,000 followers on social media for what are the must have channels. The same 12-15 channels are selected again and again. No surprises there.

Let me take this one step further and introduce the concept of app overload.

We have uncovered an interesting finding from interacting with our followers. Customers have a pain point of paying for more than 2 to 3 apps for a pay tv service. The hard-core soccer fans or the reality tv junkies can't seem to find a service that gives them what they really want. They have tried niche apps and generally are left felling unsatisfied.

The stand-alone apps will have a hard time competing for meaningful market share in my opinion. No doubt ESPN as a stand alone or a non sports bundle could enjoy some success but the single channel apps will struggle. Customers aren't willing to pay for more than 2-3 apps per month. Pull out your smart phone and look, how many apps on your device are you paying a subscription for each month? That's what I thought.

For those headed down the "build your skinny bundle" app you have an uphill battle. A comprehensive umbrella that offers a choice of "a la carte" or meaningful package by genre is more likely to enjoy success. Partner with someone who has more content. App overload is real especially when it comes to paid subscriptions that aren't used regularly.



Vidgo enjoyed a busy and productive NAB.

Keep an eye out for Vidgo as we prepare to deliver the type of skinny bundles consumers are craving. The data we have seen tells a different story. Less is more. The right balance of content mixed with a low price has all the marks of a winner. Skinny bundles (smaller pack-

ages) with less channels, appears to be what customers really want. □



Congratulations to our past OTT Executive Summit Product Speedcase winners!



Past Winners:

NYC 2016



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Ensuring Streaming Quality of Experience— Does America Need to Play Catch up?

Interview by Brian Mahony with Brenton Ough, CEO and Co-Founder Touchstream Media

In this interview, Brian continues our Executive Q&A Series on issues and trends in the OTT industry.

Brian: Thanks Breton for chatting with us about the future of content quality in an OTT world. Could you introduce yourself and tell us a bit about what you do?

Brenton: I'm Breton Ough, CEO & Co-Founder of Touchstream. We founded the company three years ago— Telstra was our first customer— and we focus 100% on OTT monitoring-- that's all we do. We are an active monitoring solution as opposed to a passive monitoring solution. We synthetically monitor the streams which gives us an advantage in the way we monitor because we can do a lot more than a player would do. That's where our secret source is. We can monitor all the bit rates all the time and that gives us a lot of detailed information that allows us to predict problems with live streams. This has been incredibly beneficial to a lot of our customers because we work very closely with the CDNs and we can find problems before they affect the viewers. Whereas with passive monitoring will only tell you about a problem when it is already failing, while we are proactively alerting customers before it fails. This is our current mantra.

Brian: OK, can you please give us an overview of your technology architecture?

Brenton: Sure, as I said we are a synthetic monitoring tool so everything is in the cloud. We are a core system on Amazon and we have hundreds of servers deployed all over the internet that make all the requests configurable by our users. You can configure your streams and tell our system where you want them to monitor from in the cloud and we will make those requests from those locations and therefore exercise the CDNs in those locations.

Brian: Let's talk specifically about content. Is this as big a problem as it used to be three, four, five years ago from an OTT perspective?

Brenton: It's not as big a problem for some of the biggest players. Our biggest customers, such as Sky in the UK who has been using us for a couple of years now and are on the leading edge of OTT, do not have a problem— their streaming works unbelievably well. They spend a lot of time and effort making sure that happens. Conversely, we have seen some newer players, many in the US, who haven't taken it quite so seriously as some companies in Europe. They tend to take



Brenton Ough is a specialist in availability and performance monitoring for IPTV OTT live and VOD streams with a passion for media, specifically sport broadcasting. With over 25 years in technology Brenton is an entrepreneur with experience including product innovation and development, business operations and strategy. He is a keen hands-on motivator and a believer in partnerships. Brenton's time with Touchstream was preceded by many years with Hewlett Packard in both London and New York. Among his other capabilities, Brenton is currently learning Spanish having moved to Barcelona to establish Touchstream's newest branch office.

more of a broadcast/telco attitude about things and they haven't quite caught onto it. Some of these folks have come to us and we explain what we do and they still don't quite understand it because they don't actually understand OTT very well. Whereas the Europeans, especially in the Nordic areas, really get it. There is definitely a difference across the world. The ones who take OTT very seriously and have dedicated teams that are experts in their area are winning the game.

Brian: When you talk about content quality, from a consumer perspective, they experience problems such as latency, buffering, etc. very differently now because they are much more sophisticated than they were a few

The Touchstream Advantage

 24/7 Protection Unlike in-player monitoring tools, Touchstream's active monitoring tests all your live streams 24/7, even when no one is watching.	 Actionable Alerts We monitor at your front door and alert you to actionable issues under your control, not those over which you have no control - like the vagaries of ISPs.	 Fast, Easy setup We are a cloud based monitoring service and can be up and running for you within 24 hours. It's a hassle free implementation with no code changes, nothing to install. We take care of it all.
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years ago. Even my kids know what some of those terms are. Because of this increased awareness and sophistication, do you feel like we have reached the stage of “good enough” or have the stakes been raised even higher?

Brenton: The stakes are definitely higher in terms of quality, which has more to do with the fact that content is available in multiple places now and it’s becoming very competitive. Again, it’s definitely a geographical and company maturity that’s driving that. The consumer is not stupid. Studies tell us that if consumers have to wait more than 2 seconds, then they will abandon the stream and then 33% of them will not come back to the service. These statistics are very real because there are a lot more choices. You can get more sports, for example, on a lot more channels now than there were before.

Brian: And this presents its own set of challenges doesn’t it? When we were watching the Super Bowl, the men watching in the basement “man cave” had a few seconds delay on their device and so had to suffer the premature screams and cheers of our wives watching upstairs. With so many services offering the same content, how does this impact the industry and what can we do about it?

Brenton: There has been a lot of talk about latency, but my view is that it’s not going to improve a great deal in the next twelve months but more like a couple of years. There are several factors that contribute to it: live encoding has to go through multiple steps and that’s not really going to change very much, even though you can encode on a camera now, there are still a whole bunch of other steps to go through. You may be able to half it but you will never get it down to 0 or 1 second. It’s always going to be 10-15 second delay. This issue is a bit overstated. For years you’ve had spoiler alerts in various countries where they have a delayed transmission of a game that was played two hours previous. So, on the news, they warn you with a spoiler alert as to the outcome of the game and those serious about watching the game themselves



One of the many camera angles one could replay in the 2014 FIFA World Cup.

can choose to turn the channel. I think people do this in streaming as well. If you don’t know something, then don’t log onto twitter where the twitter feed is running right next to you because it will ruin it for you. For folks wanting to watch their favorite sports, getting access on any device is way more important than the latency problem.

Brian: Where do you see the OTT industry in five years? If you look at the overall user experience, will it have the same identity it has had or will it be more blended? What is your vision of the future?

Brenton: I think there will probably be a bit more blending. I don’t think we will ever get rid of TV via traditional broadcasting like some are predicting—that’s absolute rubbish. But I think it will diminish and there will be an evening up between traditional and OTT. Remember at this point in time, it’s still about 80% broadcast television and about 20% OTT. I think that will move more to 50/50. For example, my son he doesn’t really know how he’s watching it, he just knows if he presses this button he gets what he wants to watch. It will just become a little more seamless. What will happen is that there will be more personalization and discovery because there is too much to find. Many of the early OTT services were like American cable was...300

channels with nothing to watch because you cannot find what you want to watch. Again, my son for example, knows that if he goes to YouTube to watch something that he will click on what is recommended because it is similar. Content personalization is becoming increasingly important in OTT. Finally with sports, the multi-immersive experience, with multiple camera angles of the game and things like that, is becoming increasingly important. For example, for the last FIFA world cup you could replay a goal from 20 different camera angles. That is what is important...this is the kind of thing people want. It’s going to get better and better, and OTT will allow you to do so many more things, choosing camera angles, personalization, an immersive experience, and content discovery will certainly be important trends in the future. □



Value and Adoption of 4K

By: Michael Her

The biggest advance in live streaming over the last few years has been around video quality, which is now better online than on traditional cable or satellite TV. Evidence of this comes in the form of 4K live streaming, where you can receive content streamed directly to your Smart TV at four times the quality of HD and twice the frame rate of traditional TV, all over an unmanaged network like the internet.

4K OTT internet delivery enables content holders to be everywhere that their viewers are – across countries and devices – and offer them the best experience possible with the highest quality content.

According to an SNL Kagan survey, OTT delivery of 4K content will skyrocket in the next three years. Over-the-top delivery of live and on-demand 4K video affords content holders the possibility of providing a personalized, interactive service in Ultra HD across a growing array of devices.

Consumers are demanding more 4K content and 4K enabled TV sets are increasingly common as prices drop, but broadcasters and content owners have been hesitant to invest in 4K production thus far. However, a recent SNL Kagan survey concluded that the industry expects UHD Connected TVs to be the primary device for 4K content consumption by consumers. To deliver a better experience on Ultra HD TV sets, manufacturers need to support live 4K streaming technology that enhances the consumer experience.

Delivering the ultimate 4K experience requires manufacturers to quickly add support for HEVC high frame rate streaming (up to 4Kp60). The adaptive protocol is engineered for efficient, secure, live and on-demand streaming of high value sports and entertainment content.

Ultra HD sets and OTT Services designed to provide the highest quality streaming experience for viewers will

contain interactive features such as full DVR control, chapter points, integrated metadata, instant replay, slow-motion and timeline event markers. These engaging components are a must with viewers.

4K OTT Delivery Case Study: UFC

NeuLion successfully delivered UFC 200: Tate vs. Nunes in 4K from the T-Mobile Arena in Las Vegas to Sony Smart TV owners across the US and Canada. UFC 200 was the first-ever live, over-the-top, pay-per-view event available in 4K and delivered to consumers through an unmanaged network (the public internet).

Building on the success of UFC 200, NeuLion and the UFC delivered UFC 205 from Madison Square Garden in November 2016 and UFC 207, again from the T-Mobile Arena, in December 2016 in 4K to more than 180 countries around the world.

UFC events in 4K are delivered at 60 frames per second as an HEVC stream in MPEG-DASH.

Content is captured in 4K and then encoded directly at the venue. The stream is then compressed and delivered to the cloud distribution center with a high bitrate and without dropping any packets. From there, the stream is transcoded into HEVC, secured, and delivered via adaptive bitrate streaming to compatible devices. 4K playback on Sony Smart TVs is enabled by the integration with the SDK.

Benefits of 4K OTT Delivery

By delivering their content over the internet to consumers, UFC and other content owners can not only offer their viewers a higher quality viewing experience than standard HD TV, but also glean crucial insight into the behavioral and purchasing patterns of their viewers. In the UFC's case, this is due to the transactional nature of a pay-per-view or subscription business model,



Michael Her, Chief Technology Officer and Co-Founder of NeuLion, is responsible for defining the technology strategy and managing the product development across 6 worldwide development centers. Prior to NeuLion, Michael ran the development team for iCan SP. Before iCan, Michael served as Senior Vice President for Research and Development at Computer Associates International and was responsible for all aspects of the key management solutions for the distributed environments including network, Internet, database and application management solutions.

but the same watch data can potentially be gathered regardless of device, content type or business model.

First, consumers gain from having access to the highest quality content across different device types. The best multi-screen video services today will complement their content with interactive viewing features. For live sports, this can be integrated statistics feeds, in-app social chatter, timeline markers with instant highlights and more. Live and VOD entertainment content can include everything from recommended content to program notes and multiple language audio feeds. The consumer can select what to watch, when to watch, on what platform and how to engage with the content.

On the business side, over-the-top delivery enables quality of service (QoS) and quality of experience (QoE)

measurement since the content rights owner is directly connected to the consumer. Direct feedback, personalized video preferences, and history of viewing behavior are all collected from the viewer.

This real-time information can help activate new subscribers and reduce the churn of existing subscribers. Video views can be broken up in real-time by bit-rate, location, CDN, frame rate, device type, content type and more. Content holders can follow the feedback loops of their customers in real time and make decisions based on up to the minute data to improve service and content offerings. This sort of data is complemented by user profile data that can track preferences, what is watched and for how long and how the user navigates the service. Access to this data allows content owners to improve recommended content, thereby increasing engagement and time spent in the service, generate unique product offers and promotions based on aggregated profiles, or predict

when a customer is likely to churn and target them to improve retention. Who wouldn't want such deep insight into what their customers want, how their product is consumed, and the power to control their service delivery from start to finish?

Conclusion

Interest and awareness of 4K content is growing, pushed in part by the media, sports, entertainment and technology industries who understand the full accessibility, interactivity, and analytical benefits of over-the-top delivery. 2016 saw prices on 4K television sets continue to drop, more devices hit the market supporting the 4K ecosystem, and a slow but steady growth in the availability of live 4K content from the UFC, to award shows, sports on DirecTV, UHD programs on Netflix and Amazon and more.

Today most live 4K viewing is through a compatible Smart TV or new set top box. However, the increasing

growth of mobile video and content consumption on devices other than TVs will drive innovations and infrastructure enhancements to support 4K mobile delivery.

The bottom line is that 4K, and HDR, are here to stay. Unlike 3D TV, enjoying stunning 4K content doesn't require expensive, clunky hardware purchases and many of the challenges involving 4K content capture and delivery have already been solved. The major issues holding back wider 4K adoption now are optimizing different devices for 4K, producing more content, and further educating consumers and business users on the benefits of the new technology. □



The UFC now delivers streaming content in 4K, surpassing the quality of many cable and broadcast operators.

Is Live OTT Content a VOD Killer?

Interview by Brian Mahony with Israel Drori, Founder and President of Zixi

We caught up with Zixi President & CEO Israel Drori at NAB to discuss Zixi's platform, customers, and the future of the industry.

Brian: Israel, thanks for joining us for our executive Q&A series with OTT industry leaders. To start, can you tell us a little bit about Zixi?

Israel: We founded Zixi over nine years ago and we have been in the live broadcast business for most of those years. We are based in the United States, and our R&D is Israel. Today we have over 300 customers, ranging from BBC, FOX—all the large TV broadcasters and TV stations are using us, mostly for news and live linear occasional use. In the past we have always focused on live. While many right now are focusing on VOD, for the last two years we see a lot of customers transitioning to live. For example, we recently won a project with Amazon video managing all their live channels. EchoStar is also using us the same way for all their live ingest, as well as DirecTV.

We are a software company and we sell services, both managed services and cloud-based services or software-as-a-service. One of the key reasons for our success was the ecosystem we created

around our products. Today we have 30-35 vendors, including Harmonic, Cisco, and Ericsson, who are integrating our software whether it's as a coder, decoder or platform... even Encoding.com is using us. From players like Amazon and EchoStar, these multiple cloud platform devices are embracing our technology. At NAB, there are 35 or so different vendors presenting our product. To mention one specifically, JVC cameras come with our software embedded already. We see a growing trend for live linear type of services.

Brian: What is driving that trend? Can OTT services become true traditional TV replacement services by adding live content?

Israel: In my opinion, the main issue is user engagement and stickiness. With just VOD, it's really hard to keep the user engaged—they can use when to come in and when go jump back out. With live however, if the content is interesting, people will stay watching. For optimal monetizing, you need engagement from the user, and live can help one do this. For a long time people thought VOD would be the way to monetize content, but it was not easy. When you add live

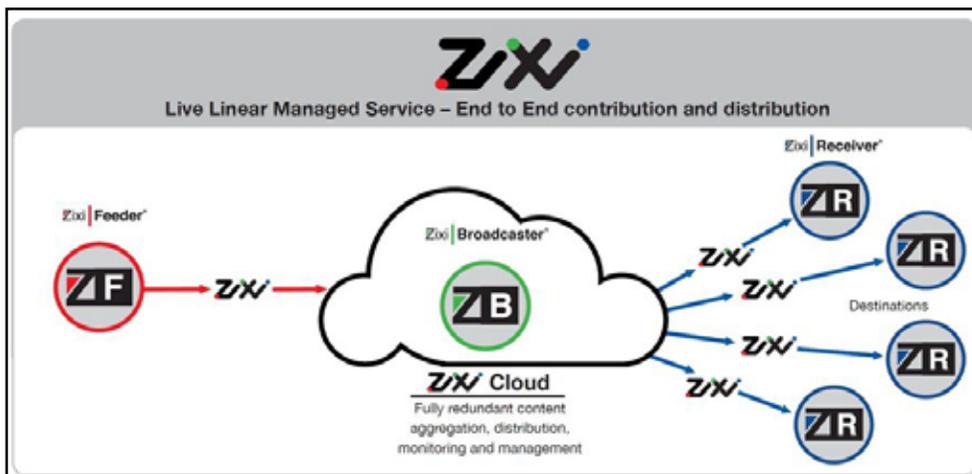


Israel Drori, Founder and President, of Zixi has (over the past 24 years) founded and operated numerous technology companies. Since founding Zixi in 2006, Israel has served as the Company's CEO and is responsible for Zixi's vision, long-term planning, market strategy and product development. Prior to founding Zixi, Israel served as the CEO and President of Integra5, a real-time voice, video, broadband and mobile data communications company. Prior to leading Integra5, Israel founded and served as CEO of Legra Systems, MeetU, and NetXchange. Israel also served as the Vice President of Wireless Access at BreezeCOM (NASDAQ: ALVR). In the early 90's, Israel founded and led LanOptics (NASDAQ: LNOP) as Vice President of Corporate Development.

you have more tools to engage users. Look at Facebook Live which creates an environment and a community where people can actually interact around the content. In VOD you don't have that.

Brian: So do you think social is helping to drive the live trend?

Israel: The potential to interact live with the content and the people around the content brings the opportunity to monetize your content much easier. Maybe not in the media itself, but as one watches a video on Facebook, there will be ads on the side while you are viewing. It seems clear that live is a major trend and will continue to be so.



Live Linear Managed Service from Zixi.

Brian: Can you tell me about the Zen platform and what's new?

Israel: When you go to live, unlike VOD, managing live workflow is very complicated. It requires a knowledge of different technologies, different networks... the workflow itself is very complex to manage. Especially if you have a large number of live channels, or occasional use for a sporting event, to make this work in a manual way takes a lot of experience and expertise and hand-holding. The main objective of Zen is to try to simplify the process and hide and abstract the complexity of that workflow. What Zen does is allow any person with a knowledge of a web interface to click and initiate the live channels and contribute it into the cloud or into a CDN without needing to understand what is taking place in the background.

Brian: Does your platform play any role in managing the asset, as a VOD asset adding to the library after it's live?

Israel: Yes. We have ways to record a live broadcast and the technology to manage the file transfer. Companies like Wall Street Journal and Bloomberg TV are customers who can take the content, which goes live into the cloud and at the same time turns into a VOD file that they can replay after the event. So yes, this is one of our more common workflows, live to VOD. The objective of Zen is to allow you to scale that type of operation. We have customers that currently might have two or three live events a day and want to turn that into hundreds of events simultaneously running from over the world on a digital format so people can choose to watch an event in France or in Chile, and those events can take place simultaneously. In order to manage such massive live channels, it's almost a must to have such a platform.

Brian: Are there special requirements with managing that scale of simultaneously live events and then integrating it into a content management system that can then fit into the larger workflow for the operation?

Israel: One very fundamental requirement

is to have a good transport mechanism that allows you to move live high-quality content from one location to another and from one platform to another. You can have the best workflow, but if you don't have a good transport mechanism then it doesn't work. In live, you don't have the time to fix errors while it's happening. You have to have a reliable transport and that is the fundamental capabilities that Zixi offers for live events. We are the most robust transport for live, high bit rate, 4k, 16k, broadcast quality type of video. Next, field experience and integration with the platform allows us to understand how that flow works. It's very different from file management type of workflow. Again, how you connect, monitor, what type of information you monitor-- it's different than a simple file system. In a live workflow, it's important, in real-time, to see the video, the quality of the video, all the parameters of the video internally in order to detect errors. On the other end, you have to keep all the SCTE-35 markers in place and you need to have the management of the markers themselves. We provide you a way to see where the markers are, what the content of those markers so you can see where they are going and see things like whether the ad was inserted in the correct place.

Brian: Tell us more about advertising and monetization of live content. What does your platform do to help enable that?

Israel: First, we maintain the SCTE-35 markers and we know how to identify those markers in RTMP, HLS, DASH, etc. In a transport stream there are other splicing technologies and we know how to transfer that. In live, especially in the internet, there are different mechanisms to do this and our platform allows you to maintain transparency and workflow. With our software platform, one does not have to think about how to transport their live stream— we take care of it. The idea is to allow you to manage live content, the experience, and initiate channels and bring them down as fast as you can. The whole workflow is a cloud-based, with all the resources automatically allocated to those events. For live, if you want to be cost-effective, you have to bring them up as fast as you can and bring them down

when you don't need them and that's what our system does.

Brian: From your prospective, what are the top two or three trends that are happening in the OTT industry based on your experience working with partners and customers?

Israel: Live content is king now. Another interesting trend we see with a lot of our customers is to create live content that is customized and targeted to an individual group of users, something our platform allows customers to execute. For example, if you go to a sports channel and you want to watch a basketball game but they are showing a football game, the OTT provider will be able to monitor your habits and know that you prefer basketball and can quickly switch the game from live football to a previously recorded basketball game or highlights to keep you from leaving the channel. They can make it more of a linear channel while you are watching. We've seen this with some of our customers, they are creating personalized live channels for users. They can bring up that content very quickly and create a channel and allow the transition of what had before into the new content very, very quickly.

Brian: So the last question is where do you see the OTT industry going? Are we going to see these OTT services being replacements for traditional TV?

Israel: I think it's already happening. People are going to consume the content they like. Maybe over the top TV is replaced by over the top video because it's not really about TV anymore. People are consuming content all the time from any device whether it's live or VOD. A good example is what DirecTV does with live channels and services. Basically what they say is here are all of our live channels— watch it any way you want, whether it's TV, satellite, or a mobile device. That is the future of OTT. □



Programming Rights Within the OTT World

By: Brad Danks

This article examines the trends in programming rights acquisitions as a guide to determine how to successfully compete within the OTT space. If we examine the strategies and approaches to rights acquisitions over the early years of OTT development and compare them to today, we gain insight into how the OTT market will look in the future. OTT executives can use this as a guide to determine both strategy and positioning relative to the marketplace. It should assist us all in gaining some perspective on how quickly the market is maturing and give us some guideposts on what to expect in the future. At the core, it is my firm belief that it will be the battle over programming rights that will determine the winners in the OTT space.

While not unique, I believe my position affords me a perspective that few others have experienced. In my previous life as an entertainment & media attorney, I negotiated thousands of programming deals on behalf of major broadcasters, distributors and production companies from around the world. I am therefore well aware of industry standards going back at least thirty years.

In my current profession as the CEO of a small linear broadcaster, I have watched the rise of Netflix (our primary competition), experienced the successful launch of a stand-alone OTT service to compliment the same entity's linear offering, and started to build the foundations of that entity's global expansion. Finally, as the CEO of a niche service that acquires all types of programming—from movies, drama and comedies to web series, short films and lifestyle programming—I can confirm that my comments here apply to changes across most content genres from deals with major studios to the most “indie” of independent producers.

The Two Rights that Matter

In my observation, you can view the entire development and maturity of the

OTT market by observing two specific rights of licensing: exclusivity and territory.

The rise of OTT services has not changed copyright law or the types of rights available for programming acquisition. The basic acquisition rights for OTT are the video-on-demand (“VOD”) rights that developed in the 1990s when home video rights were also obtained for direct-to-consumer delivery through the television. This is achieved through non-exclusive licenses for the content. Non-exclusive licenses continue to be the norm for acquisitions for both television and VOD. The reason is simple: the content owner can maximize revenue by selling to as many parties as possible. The licensee can pay a much lower fee in exchange for giving up this right of exclusivity. They are usually happy with this arrangement because they do not perceive other acquirers as competition.

When Netflix began streaming content in 2007, almost all of its programming deals were non-exclusive. This allowed Netflix to build a large library relatively cheaply, as the content owners – primarily the studios – welcomed Netflix as a new non-exclusive window akin to a MSO (“Multiple System Operator”) or video rental store with a new customer base. There was no perceived threat of long-term competition and up to a few years ago, many argued that Netflix had no impact on the value of the broadcasting right. However, those of us feeling the pull of Netflix on our customer bases disagreed and began to increase our demands for exclusive rights to premium programming.

There is nothing new about seeking exclusive rights to premium programming. This has always been the norm for programming originating from major networks and broadcasters. It is well understood that exclusivity yields benefits of distinctiveness and of course, significant revenue when done



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right. However, the risks and costs are considerably higher – often thousands of times higher – than non-exclusive acquisitions.

What is increasingly new is how the acquisition of exclusive rights to content applies to the VOD window and even to programming syndication. The consumers' expectation that they can wait until a given show is on an OTT platform they already subscribe to has diminished the value of the exclusivity period for broadcasters. The industry response has been a gradual collapse of platform distinction between broadcast and VOD windows. Broadcasters want longer exclusive periods before seeing their programs move to Netflix or other OTTs. This is spurring many of them to

launch their own OTT platforms to avoid this problem – CBS All-Access being a good example.

Original Programming

The best indication of increase in competition for exclusivity is the rise in the amount of original programming commissioned by the OTT players, most prominently Netflix and Amazon, but also Hulu. The additional costs and risks associated with original programming became a necessary evil as these companies acknowledged that they would not be able to rely on licensing a continuous stream of premium programming.

Territory

Territories are another key area of change. Traditionally, television and filmed entertainment has been sold by territory or region, with local players being in the best position to monetize the content within their market. This has been particularly evident where advertising is

the primary revenue model.

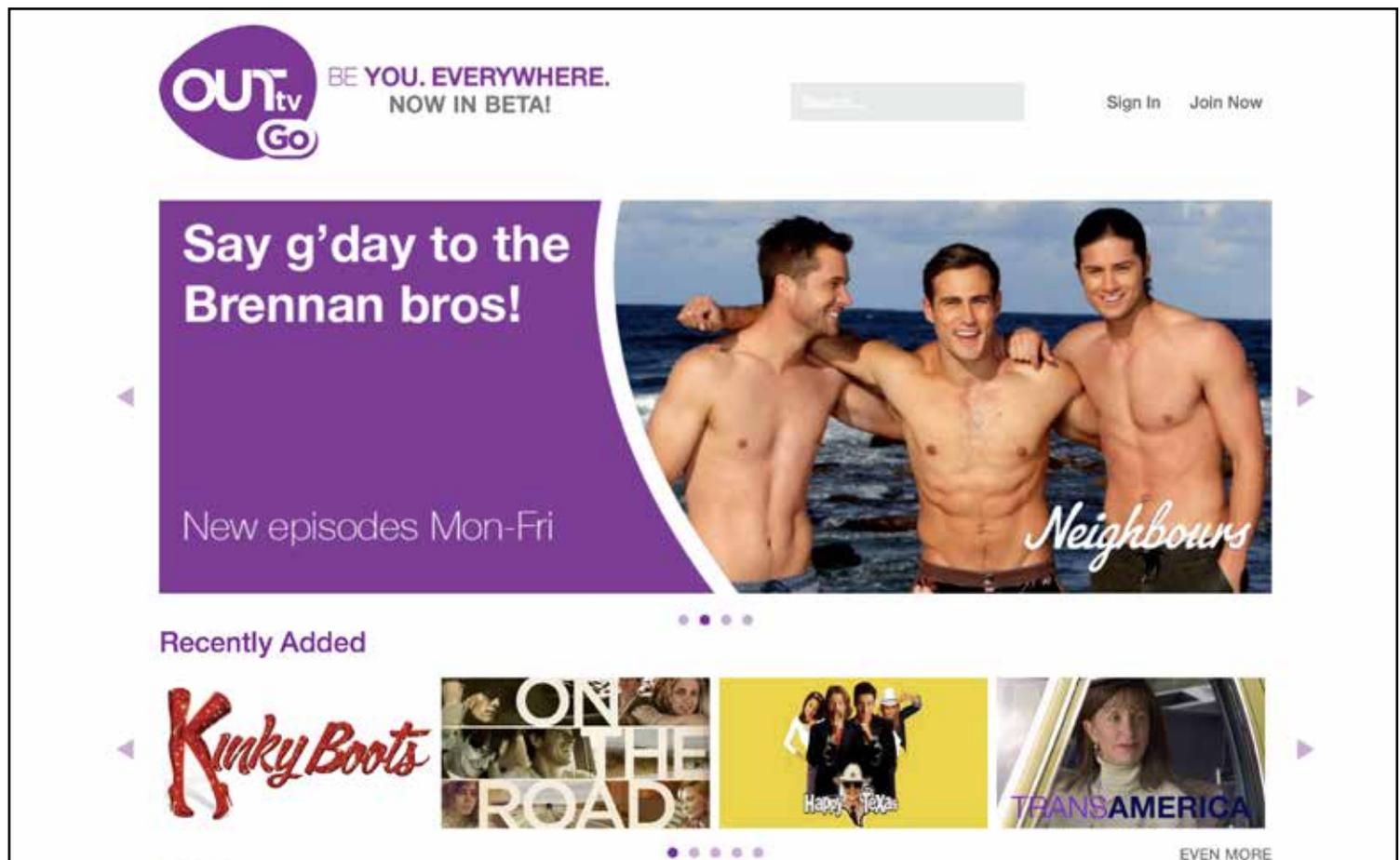
The rise of Netflix, Amazon and other global players is putting pressure on local players. These global players can use their global distribution to leverage the acquisition of rights for multiple territories. For example, we commonly find that Netflix has acquired content for the US upon the condition that the rights for Canada are included for a marginal or even no additional cost. This prevents the content owner from maximizing revenue across territories and also prevents local players from having access to it. Fundamentally, it is shifting the business from single territories or regions to one where you must compete on a global level.

As a result, the premium content leaders are changing their global strategies. The best example may currently be HBO. Long considered the industry standard in premium cable content production, HBO has gradually eliminated program acquisitions and focused on their own exclusive, original

programming. Globally, they would license their programming on a show-by-show basis to any broadcaster or distributor. However, over the past few years they have taken a focused approach on a territorial basis. In some countries they have done exclusive deals with local players, and in others, they have launched their own OTT platform. Either way they have sought to maintain a global exclusivity over their own content.

Industry Maturity

Those of us who live in the wake of Netflix and HBO need to recognize that their strategic approaches point the way for the future. The need for content exclusivity that is distributed on a global basis will be fundamental to future success. This is a general trend and there will remain specific exceptions, but the rise of OTT will mostly benefit those who understand and prepare for this unstoppable change in the production and distribution of content. □



OUTtv re-thought how to manage content licensing in an OTT world.

Automating Quality Workflow for OTT Content

Interview by Brian Mahony with Charlie Dunn, General Manager at Tektronix

In this interview, Brian conducts his Executive Interview Series on OTT issues, trends and gains insight into the future of the OTT industry.

Brian: We are joined today by Charlie Dunn, General Manager of Tektronix, to talk about the role content quality will play in the evolution of the OTT industry. Charlie, let's start with a brief Tektronix background please.

Charlie: Thanks Brian. Tektronix has a long history in the broadcast industry. We've extended that in the last ten years with a major presence in cable and telco distribution elements. Our goal in life is to help our customers deliver a high quality product, whether they are capturing it or delivering it. Right now, almost every one of our customers is interested in an OTT deployment scheme. We want to apply the same mission and vision to that workflow.

Brian: Can you give us a general overview on Tektronix, your focus,

your products, and a little bit about your customers and some of the market segments that you cover?

Charlie: Our market segments are covered in two big chunks: 1. people that create content 2. people that deliver content. Our focus on the delivery side is more of a network-based product, that's how they measure quality, using our Aurora and Sentry products. On the content creation side, where Tektronix got our start, we deploy quality monitors and wave-form monitors and other elements that help people do a really good job of live production.

Brian: We all know that quality is a huge issue for the industry. For OTT to really succeed, it needs to become broadcast-like. What are some of ways that you solve that challenge for customers?

Charlie: Our tool, Sentry, is meant to put the same kind of eyes that you would typically have in a broadcast but do that in an automated way. We can look at the



Charlie Dunn is the General Manager for the Video Product Line at Tektronix focused on analysis and monitoring of content in the rapidly changing landscape of media and entertainment. He brings more than 15 years of experience in the broadcast and professional video marketplace from his prior leadership roles in engineering, product management and marketing with Grass Valley, Inc. Charlie earned his Bachelor of Science Degree in Electrical Engineering from Washington State University and his MBA from University of California, Los Angeles Anderson School of Business.



OTT opens up the huge audience in the U.S. for high-end motorcycle racing.

stream to see if the picture looks good, whether the stream that is encapsulating it looks good, whether the audio is right—is it too loud?, are there captions for legal compliance? etc. We can measure that at many different points in the workflow; before the encoder, after the encoder, after the packager or even after the CDN. We can make sure that the customer has an end-to-end view that everything is going OK.

Brian: You mentioned workflow, obviously really important for all types of operators to be able to manage that very complex environment, especially when you are looking at different formats and different platforms and different types of content. What are some specific things that your solution offers in terms of managing workflow? Additionally, live-to-VOD

and live integrating into more of an OTT experience is becoming really important right now. How do you help customers manage all this?

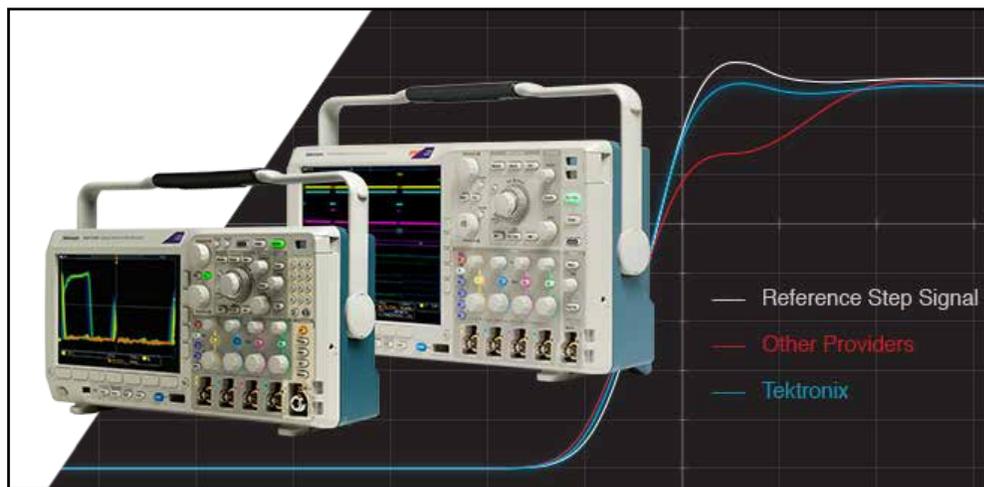
Charlie: We've really focused on making sure that there is consistency all the way through the workflow. And when there is a problem on the end, our goal is to help the customers identify where the problem is within their workflow really quickly. For example, one of our major distribution customers was able to cut down on the time from when they recognized and fixed a problem by roughly ten times. Whereas it might have been something they could fix the next day, they could start working on it and fix it within a half an hour from when the problem was shown. It's not just about saying something is good or not, but if there is a problem, how do you help fix it right away. We really study the workflow and help customers solve that.

Brian: When customers come to you, what are the major selling points? What problems are they trying to solve and how do you measure that and quantify the benefit of what you are providing for them?

Charlie: There are two parts to that. First is to provide a view all the way through the flow so that we can see where the problem is. Second, if we go deep enough within the flow then we are not just checking packets have dropped or not, but we are actually looking at the content, picture quality, and audio quality so we can give them full confidence that they are delivering the right thing.

Brian: Shifting gears, lets chat about customers specifically. A lot of your customers are looking to migrate to OTT. Can you give us some examples of that? What is driving them and what are some of the challenges that you are helping them with?

Charlie: We have a customer in Spain who is a traditional broadcast production company and they do it for sports races. The races are mostly in Europe. So they go through a traditional television network there, but they have a huge



Tektronix claims an advantage by measuring quality before and after the CDN.

audience in the United States for high-end motorcycle racing. One of the best ways they can access that content is by having an over-the-top solution. So we built an application for that. One of their big concerns is, are they delivering a quality product in the US and how can we put probes geographically throughout the US to ensure that that kind of quality is delivered?

Brian: That's an interesting example because you mentioned an international deployment. Is there anything specific that you need to do for delivery content "across the pond" that is a unique challenge that would need to be addressed.

Charlie: I think where customers see the value is if they can measure it before it's going into the CDN and then measure it again after the CDN. This approach more or less gives another check on the SLA agreement that they have with the CDN provider.

Brian: Is there anything you can do to map the quality of the content in the network to what the customer actually sees and tie that into measuring the overall viewing experience?

Charlie: We are working with people that also have measurement tools in the device so that we can correlate what individual users are seeing and what we are seeing at different points in the network to give customers an end-to-end

view. We can do everything from where the signal comes in through the origin server and then post CDN and different geographies, but we really want to work with a partner who is putting them on the device. That's another specialty we partner with to give customers the whole solution.

Brian: Where do you see the OTT industry going over the next five years? What are the major forces that are going to shape the development in the industry? Where do you see, from a consumer perspective, the evolution of television going?

Charlie: Right now, we are involved in all parts of television and the main driver is how people are consuming content and how they want to consume it. It's changing people's business models about advertising, it's changing people's ideas about what their reach is geographically. It's not just about OTT, it's rippled all the way through the broadcast chain. We think it's an enormous force, but to be honest we don't know enough about all the forces that are at play right now. This is a huge opportunity for us to expand our customer base and the number of people that we serve. □

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