

The Frontiers of Video

Remember when TV was just TV? Today, creating converged applications, delivering TV Everywhere, finding a competitive edge in the Netflix era and distributing local content are just a few of the challenges for video providers.

By Masha Zager ■ *Broadband Communities*

TV as the Center

"I've always had a notion of multiscreen convergence, where the TV would become an integral center for all things," says Brandon Brown, CEO of Zodiac Interactive. "Now, for the first time, we're starting to see the realization of that vision."

Though PCs have been integrated with mobile devices since the first BlackBerry was released, televisions, for the most part, have remained in splendid isolation. Today, they are being integrated into an ecosystem in which they can share information with other devices.

Zodiac Interactive is one of the companies trying to hurry that integration along. Its middleware platform, PowerUp, helps operators build and manage multiscreen services and customizable widgets. Though the software is network-independent, much of Zodiac's work has been helping providers integrate DOCSIS with IP networks.

PowerUp's Advanced Messaging System transforms digital streams from one protocol to another, creating multiscreen converged experiences. All transformations occur in a clientless state – that is, the processing infrastructure exists in the cloud, and no software is required on client devices. Brown explains, "It must be client-independent, or there will be unacceptable limitations."

CONVERGENCE IN ACTION

Brown offers a simple example of the kind of application that PowerUp enables: A photo emailed from a mobile phone is received and displayed on a sub-

Integrating televisions with other home-based devices paves the way for such new applications as viewing email attachments on the TV screen and using iPads as remote controls.

scriber's television, and the subscriber – still at the TV – emails a response back to the sender's mobile phone.

In another example, a subscriber records a movie on her home DVR, starts watching it on TV at home, puts it on pause and resumes watching on an iPhone in a cab, then finishes watching it on an iPad at a hotel – all seamlessly, without having to search for the point where she stopped watching.

One service provider used PowerUp to create an app that lets subscribers use mobile devices as remote controls for their televisions. Still other applications include addressable and targeted advertising, t-commerce, click-to-call, voting, polling, caller ID, DVR search, movie guides and local search.

THE FUTURE OF INTERACTIVE ADVERTISING

Interactive advertising – clicking on an

ad to obtain additional information – is a "logical candidate for multiscreen convergence," says Brown. Today, this type of advertising is migrating from the Web to television screens, but consumers who click on ads might prefer receiving the follow-up information on their smartphones.

Some PowerUp customers are working on extending interactive advertising to multiple devices. Brown says, "If users simply want more information, that can be as basic as supplying an email address they'd like it sent to. If they want to interact right now about what they're seeing, there are a couple of options – they can initiate a one-on-one electronic conversation with the provider via on-line chat or VoIP, or TVCallMe [a Zodiac application currently being piloted] can engage a third option, which initiates a direct conversation with the supplier via the phone."

About the Author

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If consumers respond positively to interactive TV advertising – and many observers think they will – then advertisers should be willing to pay more for these ads. The Dallas-based research firm Parks Associates forecasts that interactive TV advertising revenues will grow from close to zero in 2010 to \$4 billion in 2014. This could represent a major new source of revenue for service providers.

The logical next step, Brown says, is to extend interactive advertising from information gathering to actual transactions, or t-commerce. “It’s a natural for shopping channels. Right now, there’s a two-device transaction – the enticement to secure the merchandise is presented on TV, and then you have to go to another device – the phone or the PC – for the transaction. It makes sense to be able to do this through a single device, instantaneously, to capitalize on human nature and the desire for instant gratification.

“The more instantaneous it is, the less resistance there is, and the more real-time and dynamic the process is, the greater the transaction completion rate will be. The object is to reduce the barriers to where they’re all eliminated.”

T-commerce could include some unlikely-sounding products. “The ability to roll out a nationwide campaign for Colgate toothpaste exists,” Brown says. “They probably wouldn’t sell you a tube of toothpaste [via the TV], but you could click for a 10 percent-off coupon against a new product they’re releasing. That coupon would arrive on your cell phone via email.”

WIDGETS AND GAMES

TV-based widgets that deliver stock news, sports scores and other personalized information are also evolving to become more interactive. Zodiac built an application on the PowerUp infrastructure to support the Tour de France, a large, multiday event with many participants. The application allowed users to select particular information and content they wanted to see – for example, they could follow their favorite riders or keep an eye on a particularly exciting segment of the course.

“Sporting events lend themselves well to this,” Brown explains. “If you can zone into specific aspects that entice you, for advertisers, that’s the pot of gold at the end of the rainbow. It’s logi-

cal to think that if *this* guy is watching *this* event and focused on *this* rider, he’s interested in cycling, in this individual rider, and probably in the type of products this rider endorses ... and no doubt you could go tenfold deeper.”

Another frontier for Zodiac is gaming. The company just announced a partnership with Canadian cableco Videotron to introduce an interactive, multi-platform games portfolio for its nearly 2 million subscribers, whether they are inside or outside the cable footprint. “It’s similar to TV Everywhere but with gaming,” Brown says. “Imagine a business executive traveling. ... Now he’d like to continue playing Texas hold ’em or join a game room that he and his friends started a couple of days ago. He’s out of the cable company’s footprint, but he still has access to everything he’s entitled to.”

Though Videotron’s revenue model had not been announced at press time, Brown expects gaming applications of this type to be offered on a combined advertising and subscription basis, with enough free games offered to get users interested and premium games available only to subscribers.

Meeting the Over-the-Top Challenge

An enormous challenge for service providers, according to Duncan Potter, chief marketing officer for the Swedish video solutions provider Edgware, is “moving from an environment where they can manage everything and make decisions to an unmanaged environment where they’re competing with everyone on the planet.”

Potter asks, “How do you actually generate any form of advantage when subscribers are using Internet bandwidth instead of going to the set-top box to access premium service?”

The competitive edge for service providers, Potter believes, lies in delivering a high quality of experience – and delivering it not only to subscribers’ televisions but also to devices from game consoles to iPads to smartphones. “There’s a massive convergence of managed networks with unmanaged networks,” he says. “We believe that it encourages, in the future, a

single platform that allows operators to serve both types of infrastructure.”

Of course, managed and unmanaged networks are still separate today, and converging them is no easy task. For example, in managed networks, IP video is distributed by multicast (one-to-many distribution), but unmanaged networks use the less efficient unicast (one-to-one) method. Convergence is difficult also because user expectations of managed networks continue to increase. “We have different expectations of game consoles and 52-inch TVs,” Potter says.

Not only devices but also protocols, encoding schemes and other technologies are proliferating. Many of them are proprietary, complex and continually evolving. “The number of potential assets you’re going to have to manage will make your head spin,” says Potter. He is confident that open standards will ultimately prevail – but not any time soon. “How many decades did it take to get the basics of the Internet sorted out?” he asks.

Edgware’s solution avoids adding complexity to video headends. Its servers, usually placed at DSLAMs, can de-

FEATURED VENDORS

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liver IPTV and cable services over managed networks and also deliver WebTV and HTTP adaptive-streaming-based services over TCP unmanaged networks. They distribute content using popularity-based algorithms to conserve bandwidth. The most popular content is served locally, less popular content is served regionally and “long-tail” or new content is distributed from the core data center.

By using the Edgeware solution, service providers can guarantee quality of service for both managed and unmanaged video. Potter says, “People are not going to pay for ... YouTube videos, but they are likely to look at premium services – high-quality video delivered to the TV and other devices.” Such arrangements would not violate net neutrality rules if implemented properly, in Potter’s view; subscribers can choose to pay for premium access to differentiated services.

In addition, an opportunity exists for operators to sell premium viewing capability back to OTT providers as a wholesale service. Once an operator builds a distributed video network, Potter says, it has most of the infrastructure it needs for a wholesale network. “You have to do session management, asset management and bandwidth manage-



Edgeware’s distributed solution enables differentiated services over unmanaged networks.

ment to make video distribution work.”

This approach is beginning to catch on in Europe, where language groups are limited to relatively small geographic areas. For a Dutch-language OTT provider, for example, distributing content via a Netherlands-based service provider – especially one that can guarantee high-quality video streaming – can

make more sense than signing up with a global content distribution network.

Distributed video delivery “could solve a huge [number] of problems,” Potter says. “The key is to build a highly effective infrastructure that can be used to offer both regional and wholesale services and that doesn’t require a massive infrastructure overhaul.”

Challenges for TV Everywhere

The battles over content rights unleashed by TV Everywhere have received plenty

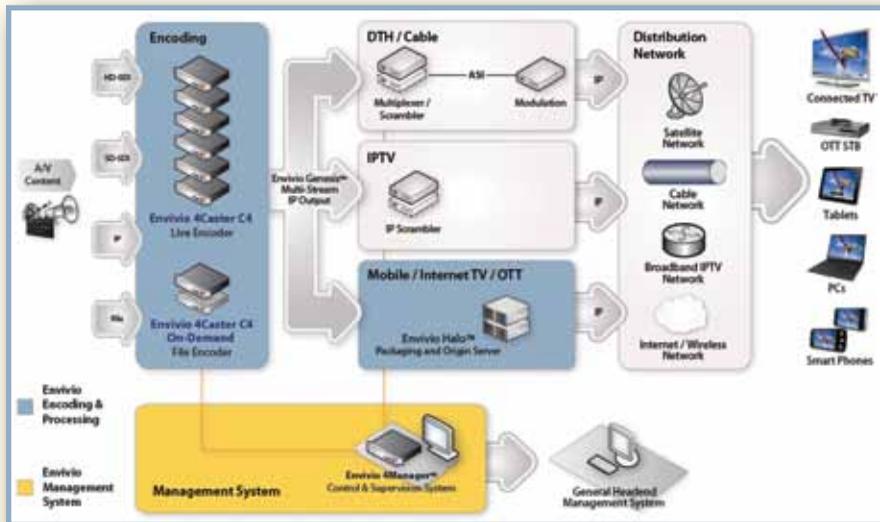
of attention in the last few months. However, these conflicts – which will eventu-

ally be resolved either in the boardroom or in the courtroom – aren’t the only hurdles on the way to developing profitable multiscreen offerings. Significant technical challenges exist as well.

For example, how can a service provider make sure its video streams are always properly formatted to appear on any device a subscriber owns?

In the past, decoding was typically performed at headends, and decoding to a new format always required more headend equipment. Because headend equipment is expensive to buy and cumbersome to adjust, this model has become unwieldy as devices with video screens proliferate.

Envivio, whose multiscreen solutions are used by more than 200 service providers worldwide, addresses this problem by outputting all video streams



Envivio’s approach to delivering TV Everywhere services

in a common format with five bitrates that range from 250 Kbps to 2 Mbps. The streams are not decoded to device-specific formats until they reach the edge of the network – the exact location varies, but in general, providers try to decode as close to users as possible.

Bob Stockwell, director of marketing and communications at Envivio, explains, “When you decide to add additional packaging, you don’t have to build a headend to do it. ... You want to move it away because [the headend] is such a delicate creature that you don’t want to touch it.” Building and power-

ing multiple headends is also an expensive proposition.

Rather than build an additional headend for a new end-user device, a service provider adds an Envivio appliance with formatting and encryption appropriate to the specific device it wishes to support. This approach is extremely flexible because it allows provid-

ers to choose which devices to support in any particular location.

Stockwell explains, “They can make those choices based on demographic information they gather – for example, iPhones and iPads have more impact on the coasts.” This flexibility also allows providers to develop device-specific advertising opportunities.

Decoding for a specific device should be performed at the network edge, not the headend.

ANDOVERTV DELIVERS VIDEO OVER FIBER

Andover, Mass., is a town with a do-it-yourself spirit, and one place where that spirit is expressed is in local-access television. The town set up a nonprofit organization, AndoverTV, in 2008 to take over and run the public/educational/government (PEG) station previously operated by Comcast. The community participates enthusiastically in producing content for the station. Members of the local senior center produce a popular show called “There’s Something About Andover,” and high school students in the TV production class create videos for the station that Wess Murphy, executive director of AndoverTV, calls “quite good.”

The town also took the initiative in 2007 to build a fiber optic network (I-net) to connect all its municipal buildings – library, town hall, police and fire headquarters, schools and more. The fiber network replaced an antiquated coaxial cable network that MediaOne – at that time the only cable company operating in Andover – installed in 1996. Instead of the 2 Mbps that the 20-year-old system offered, the town suddenly found itself with 12 strands of gigabit-capable fiber. “It’s benefited education, security, and communications between police and firefighters,” Murphy says. The I-net also proved to be a boon for AndoverTV when the PEG station was given the use of one of the six local area networks.

MIGRATING TO IP

To transport programming over the new network, AndoverTV had to migrate from its old, analog production system to an IP-based system. Murphy could not find any other nearby PEG station that had made as radical a transition, so he was on his own when looking for solutions.

He did have some specific requirements, however. AndoverTV produces programming at meeting sites all over town, including the local high school, the town hall, the library and the safety center. The original RF system was set up, as most such systems are, so that one channel would override another. Murphy explains, “You simply turn on your modulator when the meeting begins, and when you

shut it off, it defaults back to the first channel.”

However, this system was far from ideal. For example, when an event in one part of town was followed immediately by another event in another part of town, the station had to set up two independent feeds and switch manually from one to the other. Murphy was determined that the new

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system should handle multiple channels more gracefully. He says, "We wanted a system where we could originate at any of six sites and broadcast over any of three channels and do it all with a remote digital switch." The solution he devised was ingenious, inexpensive and possibly unique.

AN UPSIDE-DOWN DEPLOYMENT

The station and its video feeds are organized in a hub-and-spoke configuration. AVN210 encoders from Visionary Solutions are installed at five of the spokes – four meeting locations from which AndoverTV regularly broadcasts and the town clerk's office, which maintains a government-access bulletin board. Incoming signals from the encoders are decoded at the hub, then routed as analog video and audio over copper cable to Comcast and Verizon, which broadcast the station. A laptop computer at each field location dials into a Leightronix NET164 video router, which automatically handles all the switching, making sure remote feeds are received as needed and the correct programming goes out on each channel for broadcast. At the studio (located at the high school), a sixth and larger encoder, the Visionary Solutions AVN220, transports recorded programming for the public channel to the hub. A Leightronix Nexus video server handles all prerecorded materials.

"We ingest DVDs, VHS, DV tape and whatever else up into the server, and it records those as MPEG-2 files," Murphy explains. "We no longer run tape or DVD for playback; it's all on a hard drive now."

This setup is effectively upside-down from the normal configuration for this type of equipment. A typical installation – usually in a hotel or hospital – consists of a single encoder/decoder and multiple receivers. AndoverTV, which has multiple points of origination (meeting, event and studio locations) and a single collection point (where video is sent to the cable and phone companies) uses multiple encoder/decoders and a single receiver.

Migrating to the new system streamlined the station's operation and eliminated the noise and interference that plague long-distance analog transmission. In addition, the encoders are cost-efficient enough to be installed permanently at each location along with Panasonic robotic cameras, microphones and an equipment rack with switchers and mixers.

Using permanently installed systems allows the station to hire and train high school students to serve as camera operators and technicians for town meetings. A student technician can simply walk in, power up the system and begin the broadcast. "It's résumé material for them," Murphy says, "and we don't have to work at night."

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