JUNE 2010

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PICK HITS
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PRODUCT JACKPOT

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SOLVING AUDIO PROBLEMS
Prevert lip-sync and loudness complaints

PROTECTING YOUR VIDEO NETWORKS
Start with a written security policy

AUTOMATING GRAPHICS
Technology makes schedule changes easy

A PENTON MEDIA PUBLICATION

greenlight yourself

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Routing
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Conversion & Restoration
Live Production
Automation & Media Management

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Broadcast Engineering®

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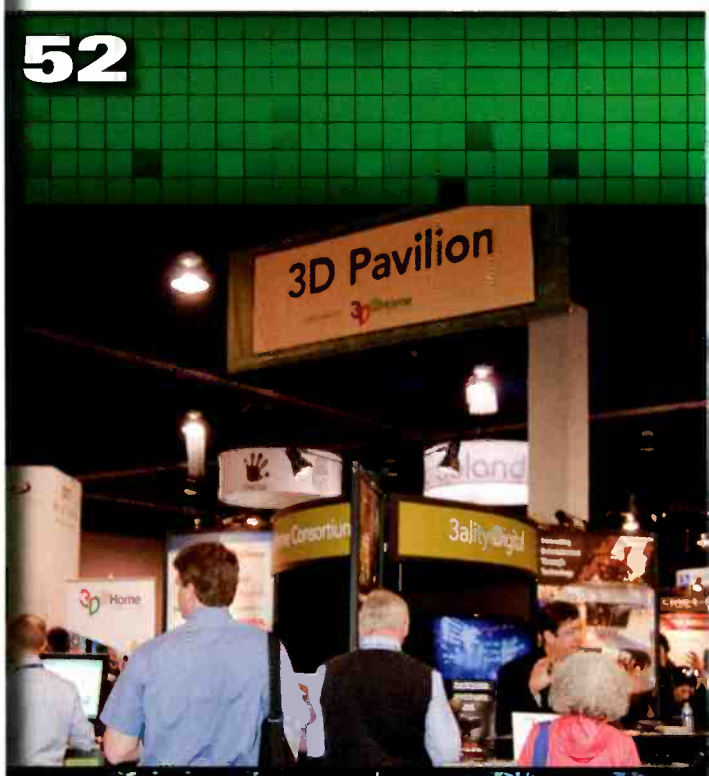
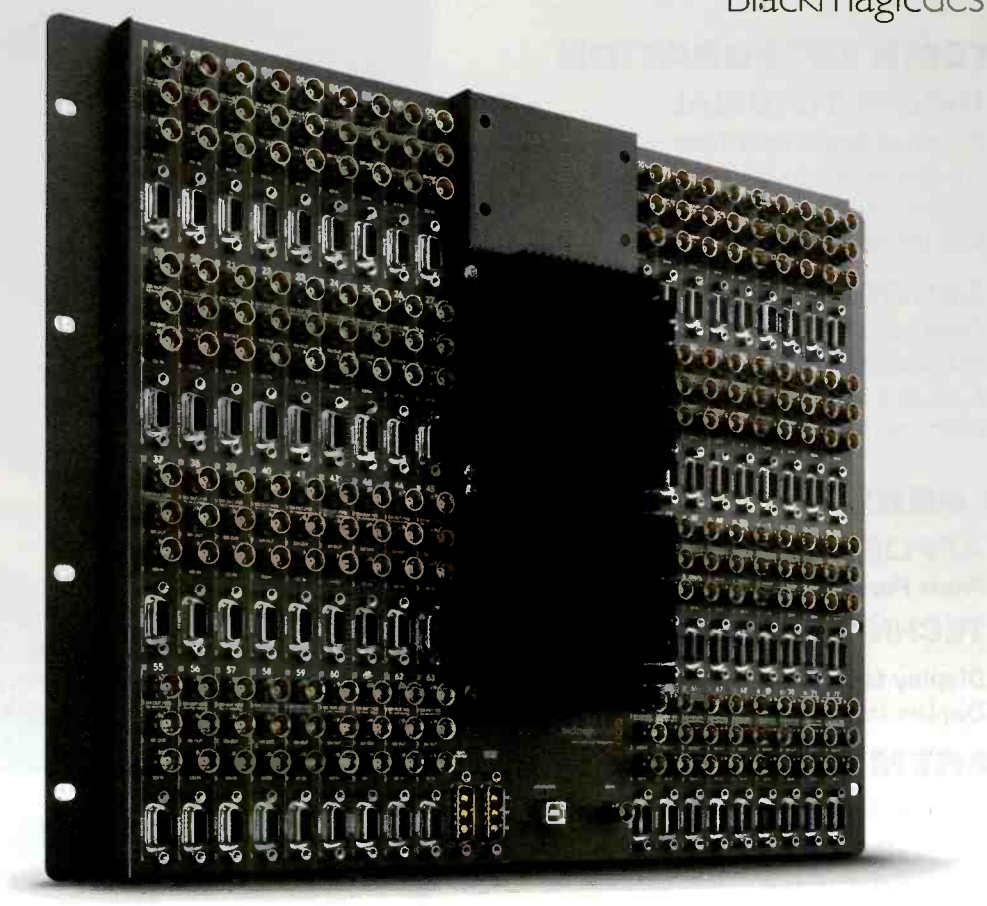


Blackmagicdesign



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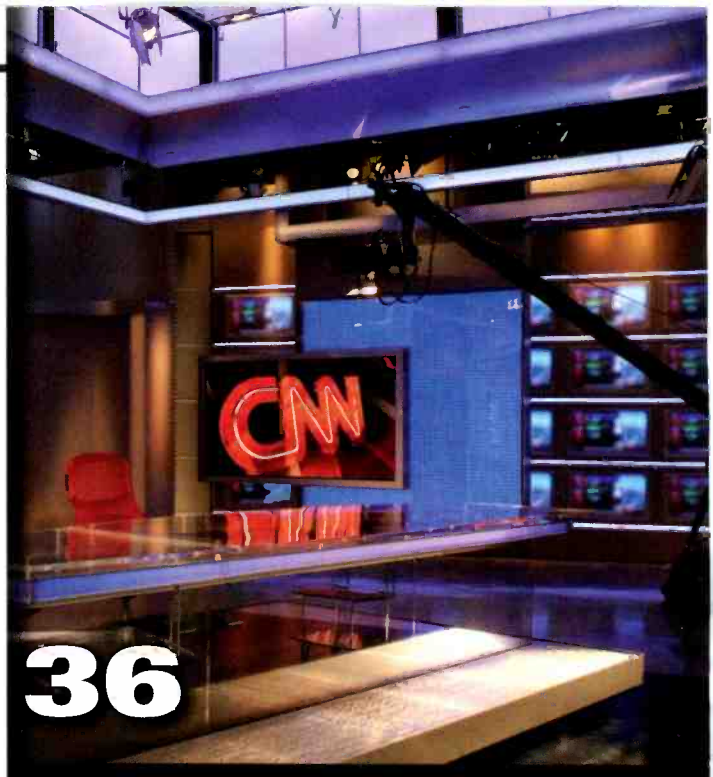
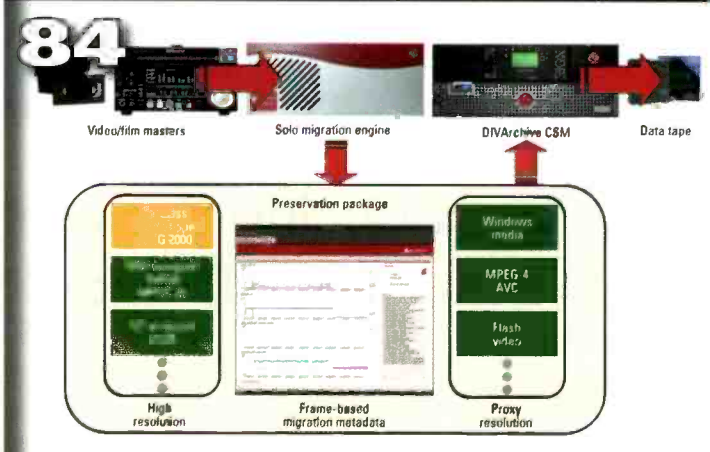


ON THE COVER:
The rotating anchor desk in CNN's new studio can move 270 degrees. Photo courtesy Ted Pio Roda/CNN.



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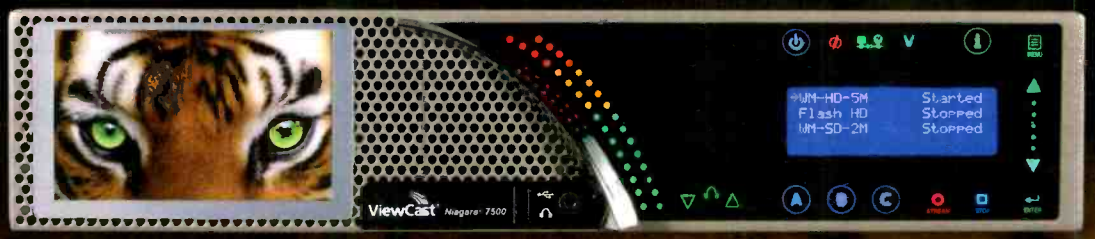

It's easy to be enticed by the alluring good looks of the Niagara® 7500 – the newest HD streaming solution from ViewCast. On the outside, its sleek, innovative design and responsive touch-control interface will excite you. Its brilliant high-resolution HD display will dazzle you. But on the inside, it's a beast.

The Niagara 7500 devours your HD video and easily transforms it into high-quality streams for delivery to IP and mobile networks. Its powerful video pre-processing features streamline and simplify your workflow. Inverse telecine, closed caption extraction and rendering, de-interlacing, scaling, cropping and bitmap overlay are just a few of its standard features.

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FCC ignores the rules

The FCC has seemingly ignored a recent Washington, D.C., Circuit Court ruling that says it has no power to regulate broadband and will attempt to further insert government into private enterprise under the guise of preserving something called "net neutrality."

Net neutrality is one of those PC social phrases that sounds good. After all, what could be bad about being neutral? However, a closer examination shows that the real implications of imposing neutrality on communication companies may produce disastrous effects, especially for broadcasters.

As a part of the 1996 Communications Act, Congress defined two types of services: communications and information, each subject to different types of regulation. Congress said the FCC should regulate Title II communications (phone) services, but it gave no such authority to the FCC to regulate Title I information (Internet) services. In addition, Congress did not give FCC bureaucrats the power to change these definitions.

In fact, even the FCC agreed with these separate definitions and regulations when it argued to support that precise interpretation to the U.S. Supreme Court in 2005 in the "Brand X" case and won. So by 2005, all three branches of government had agreed that information services included broadband Internet.

Congress has tried three times to give the FCC the power to micromanage the Internet, much like it manages broadcasters. Twice the Supreme Court voided those attempts on First Amendment grounds, and the third time, the justices scaled back the FCC's authority over the Internet to practically nothing. Basically, the court has told the FCC to leave the Internet alone.

Despite these facts, FCC Chairman Julius Genachowski has decided his commission will use a third way to regulate Internet services. He has proposed to move them under the same Title II regulatory framework as phone companies by using a bureaucratic trick called "forbearance authority."

Forbearance authority would let the FCC declare what parts of Title II regulations it would not impose on broadband, leaving the commission to fully regulate all other aspects of broadband delivery. However, the result of this sleight of hand would not have the weight of law, merely operations. A future FCC could change any or all of those restrictions at any time.

Genachowski is supported in his efforts for increased regulation by a Democrat Congress, the likes of which include Henry Waxman, D-CA, and John (Jay) Rockefeller, D-WV. These congressmen had this to say in a letter to the FCC: "To accomplish these objectives (regulation of broadband), the commission should consider all viable options. This includes a change in classification, provided that doing so entails a light regulatory touch, with appropriate use of forbearance authority (emphasis added)." In other words, these Democrats told Genachowski, "We don't like the rules either, so ignore them."

The effect on businesses of the FCC imposing broadband regulations was summarized in a research note published by Stanford Bernstein analyst Craig Moffett. He states in a blog post called "The FCC Goes Nuclear," "We would expect a profound negative impact on capital investment."

Why should broadcasters care? Because without capital, no company will invest in new or improved broadband connectivity. Broadcasters' future may depend on having access to new and wider pipes into viewers' homes for next-generation services.

So much for neutrality. **BE**

Brad Dick

EDITORIAL DIRECTOR

Send comments to: editor@broadcastengineering.com

Rethink automatic loudness control

Excessive loudness variation is probably the most common viewer complaint, and it's now something you can eliminate entirely. Our Automatic Loudness Control for our Densité interfaces is designed to address all typical loudness problems, including audio jumps between programs and commercials. To ensure effective loudness control without adversely impacting program content, we've incorporated the latest proven technologies from our partners, **Linear Acoustic** and **Jünger Audio**. It's time to rethink what's possible.

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CONTROL

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Life in the fast lane

Brad Dick's blog entry "Do you have a right to fast Internet? When is fast, fast enough?" on May 7 generated several interesting comments. Here are a few of them.

Dear editor:

Universal broadband availability is a cyberwar national security issue. Think about this the next time you are spammed or your computer is infected with nasty and destructive spyware or bot. In my state of Florida, the Public Service Commission allows the phone companies to offer a badly crippled form of dialup service in areas that are broadband deprived. At crippled dialup speeds as low as 19.6kb/s (with 28.8kb/s typical), forget about being able to download large security-related critical updates from the likes of Microsoft or Symantec. Even at full dialup speeds of 53.3kb/s, most essential websites are marginally usable. Forget about multimedia distance learning. Moreover, copper dialup lines today are extremely poor values compared with VoIP offerings from the cable company. Up in Maryland, my sister's copper-based dialup service from Verizon became staticky and died. Verizon was going to take over a week before it would schedule a repair trip. Fortunately, she had cable modem service from Comcast and finally decided to take the plunge and switch phone service to Comcast, which was out the very next day to install it.

Without broadband availability, she would have been really stuck. It is the only meaningful competition to old-fashioned phone company offerings. For the same $30-per-month service, the standard feature list would have raised her phone bill to as much as $80!

Louis Carliner

Dear editor:

First, why does broadband access automatically mean wireless? Wireless broadband, like more and wider interstates, is a bottomless pit. The actual highways and the information highway both fill up to and beyond capacity very shortly after they are constructed, and we are back to where we started except for our pocketbooks. We may find enough spectrum for wireless for two to five years, but when every Internet page has 3-D high-res video from corner to corner, each element changes every time the mouse is moved even one pixel and everybody is watching video on demand, then 100Mb/s will be totally slow and completely unsustainable. And we will then need … what, Gb/s access, Tb/s access? Where does the next batch of spectrum come from, the X-ray region? Do we then grab spectrum from the doctors' and hospitals' X-ray machines?

I see no harm in most computers being tied to land lines, optical of course, but land lines. You can always run more. Thousands of optical cables will fit in a square inch, and each will have far more spectrum than wireless will ever have. Wire (with fiber) the students' desks. Wire every room in the house. Wire any place where a person can sit down: restaurants, theaters, waiting rooms, bus benches, even restrooms; fiber jacks everywhere. This would be a far better and lasting solution. Leave the wireless for truly mobile situations such as airplanes, buses, autos, space shuttles, etc.

As for paying for it, why shouldn't the folks who are responsible for and who benefit from the increased Internet usage pay? I am talking about the Internet advertisers who force every spectrum-gobbling gimmick you can think of on us. Perhaps if they paid by the actual spectrum usage of their pages they would suddenly decide that a simple text page would work instead of tons of videos and pop-ups.

And what's wrong with TV advertising anyway?

Paul Alciatore

Dear editor:

Remember the [baloney] we got when 56kb/s was an amazing development only possible in a lab? Even though, if I remember, the basis for the T1 carrier concept was 24 65kb/s lines or 25 64kb/s lines? 56kb/s should have been easy. Next, only large companies could afford DSL. Hmm. Those bums at the phone company will do as little as possible. It stunk then and will do the same in the future unless the infrastructure is modernized. If not, we will have high speed feeding low speed.

Robert Brooks

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Managing digital assets

Governance is often overlooked in DAM systems.

BY MATTHEW GONNERING

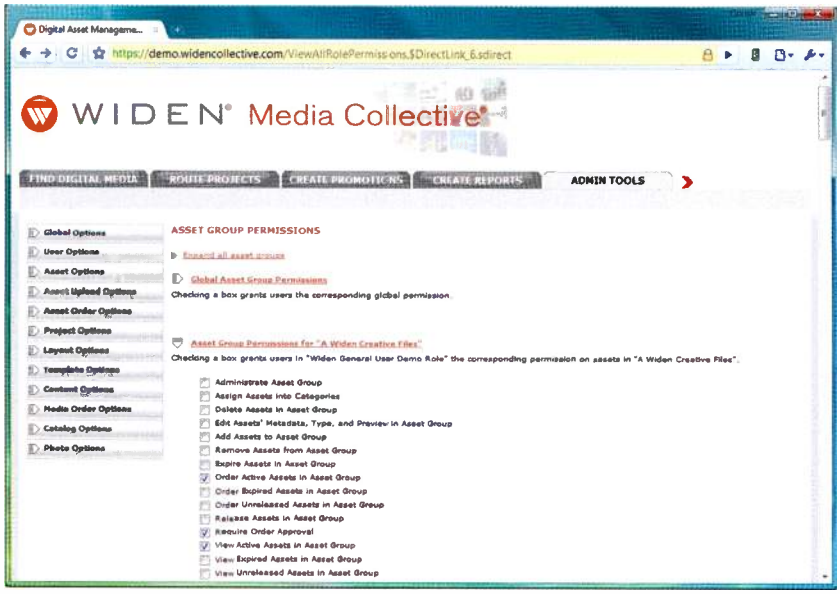
OK, so you finally have your logos, images, message documents and case studies all organized in your new digital asset management (DAM) system, and all is right with the world. Then it happens.

You suddenly start getting e-mails from your sales team that old logos are being used on spec sheets. Someone added a new product box of unreleased software into your homepage image. One of your distributors is on the phone wanting to know why his competitor has your new marketing material and he doesn't.

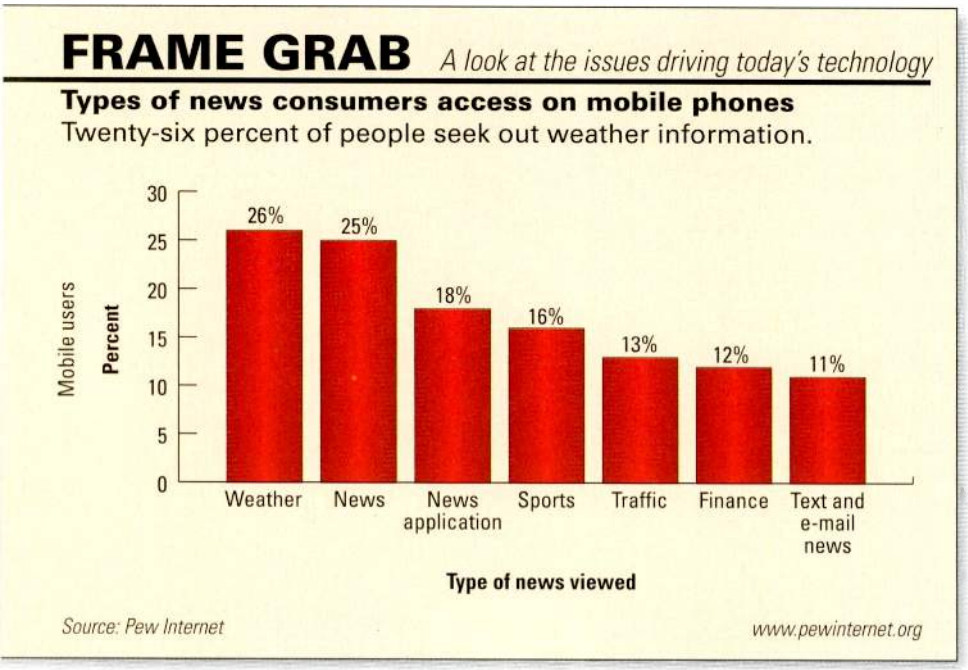
Yikes. Instead of solving a problem, have you just created a digital asset monster?

Every DAM service promises to improve access to assets. Less discussed but more important are the controls available to govern access to those assets. Improper governance controls can cause digital assets to be lost, deleted, stolen, modified or used in ways that work against a company's business objectives or brand.

For example, if an outdated logo is used in your channel, confused consumers could ignore new products, undermining months of product development and launch efforts. Using dated images or old product references in new campaigns could set back your branding efforts severely. Information made public prematurely will give competitors an unfair jump on your innovative product differentiators, harming financial performance.



In the administrative view of the Widen Media Collective Web-based DAM system, asset group permissions are applied to control the user access and administrative functions available to assets within a set group.



It might make you wonder why you went to a DAM system in the first place. Stop wondering. DAM systems are one of the best ways for large creative operations to compete in the digital age. The key to doing more good than harm is to find a DAM solution that provides the levels of granular control your organization needs.

To avoid these problems, many DAM systems offer workflow tools that allow different classes of users to have different levels of access to assets. This includes the rights to view, comment, edit, download and forward materials. Also required are features that allow rights to be triggered by other rights. For example, Group B should be restricted from downloading an asset until User A has approved it.

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MAC/WINDOWS

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- Digidesign® and VST plug-ins

MAC OS

- Mac® AU plug-in for Apple® software

These capabilities are essential for a DAM system to become a tool for managing workflow rather than a simply digital repository.

I grant thee access

Governance tools ensure that only current and approved assets are used by those with the responsibility and authority to access them. Generally, companies deploy DAM with three buckets of users: administrators, internal users and external users.

Administrators: Typically in marketing, these folks are the "Grand Poobahs" of rights. They can view all assets, users and features of the system. They can upload and download files, add metadata, and edit and change version numbers. Administrators can delete, view and order all assets, as well as create users and roles, and run reports.

Internal users: Typically in sales, Web and product teams (among others), this group has selective access to view or order particular groups of assets or all approved assets. Also, they have controlled access to various system features. Some may have access to upload assets and add metadata. Generally, internal users would not have the ability to delete or overwrite assets or administer the system (including creating users or defining roles).

External users: This group — which may include outside agencies, media, partners and sales channel partners among others — has selective access to view or order particular groups of approved assets. Rarely would they have permission to upload assets or add metadata unless they were with an agency or photographer that is responsible for creating digital assets.

Relationships are complicated

It seems simple on the surface, but when it comes to governing your DAM users, there are many types of files that can be owned by different people. To manage this requires establishing a set of relationships that can be complicated if your DAM solution is not up to the task.

To illustrate, externally you could have multiple groups, multiple brands, multiple agencies, photographers, videographers, consulting firms, PR firms and other technology providers all needing to touch your digital assets. Even some of your suppliers could need to interact with your digital assets, and those suppliers may or may not need to see what the other is doing or what they have as far as inventory. Internally, you have a corporate communications team, marketing teams and brand teams. All of these groups probably need access to digital assets, though they may not need access to the same ones.

Your assets can have multiple classifications too. Approved or released assets are current and available for use. Unreleased assets could include those on hold for a future product launch, campaign, promotion or event. Expired or archived assets are often kept in the system for reference in repurposing opportunities or tracking, but are unavailable to general users.

Your DAM system should be easy

Any reliable DAM provider should have technologies in place that will embrace and enforce the governance you want to apply, especially when it comes to permissioning assets for groups of users to see or manipulate. In general, most DAMs offer some governance over rights management, but fall short in areas of tracking, alerts and rights management features that take advantage of an enterprise environment.

The beauty of many enterprise-class and work-group DAM solutions (versus out-of-the-box DAM software) is that they allow organizations to designate several different groups or tiers of users. For example, an organization could have a group of "super-admins" that can see everything but also grant administrative-level consent to users responsible for Brand A vs. Brand B. Below that level of access are user groups with permission to search and retrieve certain approved and current assets.

Keeping all of this straight is critical but difficult. Internal and external roles and a corresponding permissions structure can become extremely complicated if not handled correctly. It all works better when the roles, permissions and rights management process are configured and controlled by the DAM client. But this knowledge just doesn't drop from the sky.

If possible, it's a good idea to see how other global brands have deployed their digital asset management systems and strategies through phases. Ask about the roles they've set up initially and how they determined appropriate groups of digital assets to implement. The first thing you should do is talk with your DAM provider, because there's a possibility that what you want to accomplish may be different from what has previously been done. A solid DAM partner will help you find the best way to get there, provide exactly what you need for set up and ensure you are enforcing the permissions structure that you'd like to implement.

It's empowering when it is done correctly. And it is rewarding when you can freely allow outside agencies to contribute to the DAM system by adding new digital assets at the same time they may be inserting metadata or transferring a digital asset to an internal stakeholder to move it forward for approval. The good news is you'll eventually be able to maintain whatever governance configuration you want, and a service-minded DAM provider will ideally be there with you every step of the way. BE

Matthew Gonnering is CEO of Widen Enterprises, a provider of digital asset management software and services.

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FCC to consolidate data

A new electronic filing system will help the FCC go paperless.

BY HARRY C. MARTIN

The FCC plans to improve its electronic filing systems by combining them into a single consolidated licensing system (CLS). A roundtable panel of industry experts participated in a workshop in May to help the commission through that process. The panel addressed such issues as: industry- and user-specific electronic filing issues; data availability and searching; consistent terminology; functionality features; error checking; notifications; system deployment; and any exceptions.

The systems currently included in the review are: the antenna structure registration system (ASR); cable operations and licensing systems (COALS); consolidated database system (CDBS); experimental licensing system (ELS); international bureau filing system (IBFS); and universal licensing system (ULS). The General Menu Reports System (GENMEN) is also expected to be included in the CLS, as well as the Wireline Competition Bureau's manual filing system. Currently, these systems are maintained separately by the various bureaus but have common data points.

The CLS will streamline access to electronic filing and underlying data. Potential new features include a single sign-on, a CLS manager and consolidated commission forms. It is also expected to be a "green" system with improved application processing time.

The single sign-on (SS-O) design will provide access to all applications, licenses and authorizations associated with an FCC registration number. It will also enable access to a manager, which could display application- and authorization-related alerts. Additionally, the feature will provide courtesy reminders, notifications and alerts regarding all of a licensee's authorizations and applications.

The FCC envisions a consolidated commission form to streamline virtually all application processes. This would include a main form to collect information applicable to all license and application types, followed by subforms to collect bureau-specific information. This is an expansion of the approach currently used by the Wireless Bureau in its Form 601.

Implementing such an approach will be a complicated effort, including consolidation of many forms and adjustments of rules and procedures. Because of the massive amount of work involved, the FCC expects the implementation to occur gradually over the course of years, with new features added on as elements of the system are deployed. Implementation will occur in phases; CDBS is expected to be dealt with in the first phase.

The end of the CLS path would signify the end of paper filings. The FCC has already reduced the number of paper filings to a relative minimum, but the official end of paper will mark a significant milestone in the evolution of the commission's processes.

A CLS page has been established on the FCC's reboot page (*reboot.fcc.gov/reform/systems/cls*) through which it is collecting ideas and questions from the public. Further, the FCC has established a docket (MD Docket 10-73) in which it intends to release a notice of proposed rulemaking inviting additional comment.

Regulatory fee proposal

The FCC has asked for comments on proposed 2010 annual regulatory fees. Fees for UHF digital stations will increase vis-à-vis 2009, when fees were based on a station's pretransition analog facilities. The increases range from $3325 for stations in markets 11-25, $400 for stations in markets 26-50, and $1050 to $25,300 for stations in markets 1-10. These changes could be modified based on the comments the FCC receives. BE

Harry C. Martin is a member of Fletcher, Heald and Hildreth, PLC.

? Send questions and comments to: harry.martin@penton.com

Dateline

- All TV licensees who have not already done so must file their 2009 biennial ownership reports by July 8 using the FCC's new Form 323.
- By July 12, all commercial TV and Class A TV stations must electronically file their children's programs reports (Forms 398). Also by July 12, a certification of compliance with commercial limits during children's programs must be placed in stations' public files. Material to substantiate compliance with restrictions on the display of website addresses during children's programming must also be placed in the file by July 12.
- Noncommercial TV stations in California, North Carolina and South Carolina must file their biennial ownership reports by August 2.
- August 2 is the deadline for TV stations in California to electronically file their broadcast EEO midterm reports (Form 397) with the FCC.
- August 2 is the deadline for TV stations licensed in the following states to place their annual EEO reports in their public files: California, Illinois, North Carolina, South Carolina and Wisconsin.

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Interactive services

ATSC standards support interactivity at home and for mobile applications.

BY ALDO CUGNINI

In 1953, children could interact with the "Winky Dink and You" program by drawing on a piece of clear plastic affixed to the TV screen. Kids would be asked to draw items on the screen that would help their hero, Winky, during his adventures. For many, it is considered the first interactive TV show. Interactive TV has progressed significantly since then. In the early '70s, interactive services such as Teletext used the VBI of an analog TV signal to transmit auxiliary data during a regular broadcast. Today, new DTV services offer viewers VOD or instant access to the scores of their favorite teams, all by using the TV remote control. This month, we review some of the existing interactive TV services and examine how current ATSC standards will support interactive services in the home or on the road.

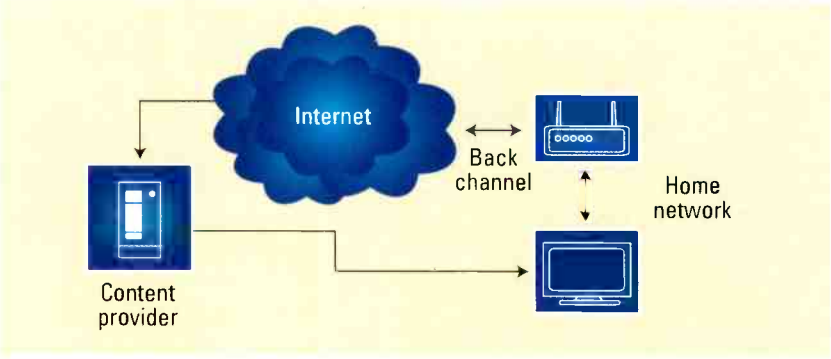

Figure 1. Interactive TV includes a back channel for communication with a content provider.

Defining interactive TV

There are multiple levels of interactive TV. At the lowest level, viewers interact with the TV by using a remote control to change the volume or channel. At a medium level of interactivity, users can actually select the desired program to watch, independent of a fixed broadcast schedule, and can control how the program is being viewed. For example, DVR functionality allows users to rewind, pause or fast-forward, on demand. In addition, Internet applications (or widgets) may overlay on top of standard TV programming and allow users to access user-defined data (such as game scores) in parallel with regular programming. All of these are local interactivity functions in that users' feedback directly affects only the behavior of the local device. At the highest level of interactivity, users (audiences) truly interact with a program and can affect how the show continues. For example, in a game show, the audience can vote in real time and help (or trick) contestants with multiple-choice questions. In that case, the interactivity operates at a system or network level.

For our discussion, we define interactive TV as any TV with a back channel. This back channel can be a dedicated uplink channel in a wired distribution system (e.g., cable or IPTV) or a separate connection to a service provider via a telephone modem or broadband connection. Figure 1 shows an example of such a system. A content provider broadcasts a TV program through any of the available broadcast media: satellite, cable, OTA

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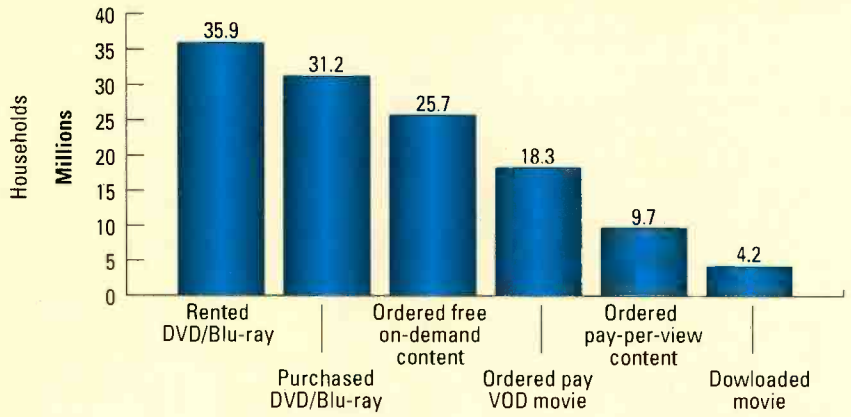

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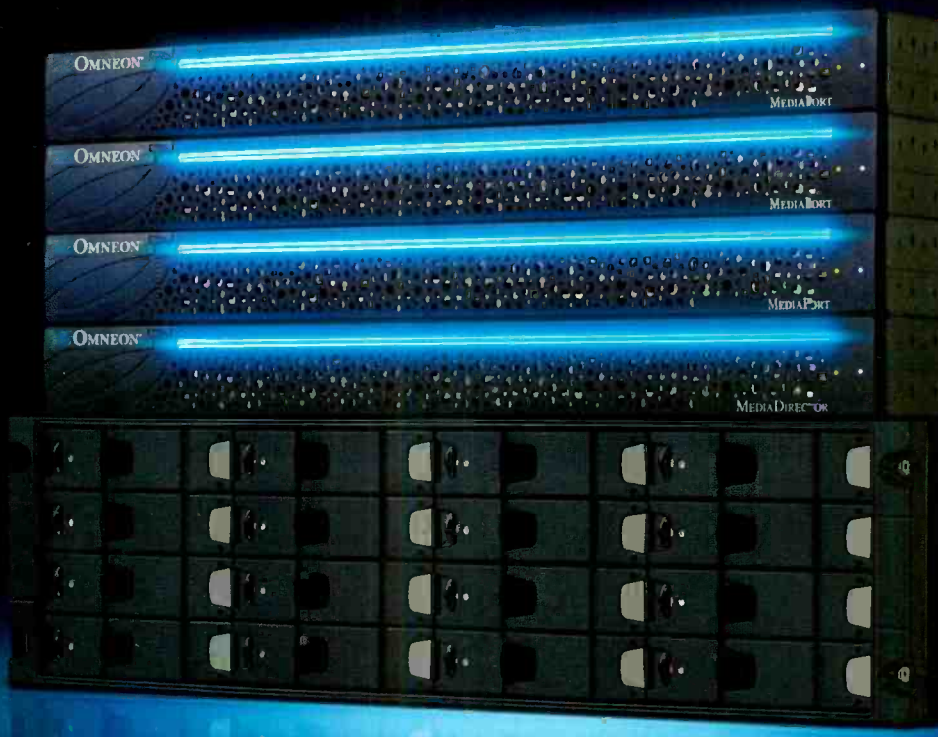

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or IPTV. Users receive the program either directly to their TV or through an STB. The TV or the STB is also connected to the user's home network via a wired or wireless connection. By connecting their TV receiver to the Internet via the home network, users can interact with the TV program.

Current interactive TV services

Cable and IPTV services can implement a return channel without a separate broadband connection. Some cable operators combine traditional TV programming with a variety of Internet-based features, including access to VOD, local weather and sports results. While these services are usually implemented by means of a common set of standards that allow for harmonized services and interoperability, the extent of full interactivity is usually in the ordering of VOD content.

Cable operators are also moving toward tru2way, a Java-based software platform that allows content providers to integrate a variety of new features, including interactive guides, services and VOD. Tru2way defines two types of applications: bound and unbound. Bound applications are tied to a specific channel and are delivered as part of the channel's video stream. Unbound applications allow users to interact with multiple channels and set-top applications.

Satellite operators also provide interactivity to subscribers, but a telco or broadband connection is needed. On-screen widgets that allow users instant access to a variety of Internet-based services, such as local weather, scores and image collections, are now emerging, and customized mixes allow users to view multiple sports and news programs on one screen. Also, on-demand programming can be downloaded using a home network and broadband (Internet) connection. Other interactive TV services allow users to customize how to view scores and statistics from their favorite teams. Similarly, users of the latest Internet-connected TV or Blu-ray player models can access a variety of Internet-based services, including VOD, regardless of how they receive their main TV broadcasts.

Broadcast now supports interactivity

Because of the one-way nature of broadcast, a return channel to provide full interactivity must depend on a separate, out-of-band mechanism. Two ATSC standards form the basis for how interactivity can be integrated with broadcast services: ATSC A/96 Interaction Channel Protocols and A/101 Advanced Common Application Platform (ACAP). In the ATSC A/96 specification, ATSC provides

guidelines and specifications for interactive services using an ATSC broadcast. A/96 uses a five-layer reference model that includes a data-link layer, a network layer, a transport layer and an application protocol layer. In addition, network layer-related protocols are all standards-based, using TCP/IP and UDP. At the application level, A/96 uses standard HTTP 1.1 protocols. The A/96 specification does not define the physical and data-link layers.

The ACAP standard was developed as a harmonization effort between the ATSC DTV Application Software Environment (DASE) and CableLabs' Open Cable Application Platform specifications. The standard gives content providers, broadcasters, cable and satellite operators, and consumer electronics manufacturers the technical details necessary to develop interoperable services and products by defining a set of standard APIs.

Mobile DTV is built around interactivity

The ATSC A/153 Mobile DTV standard enables local TV stations to deliver live TV broadcasts to a variety of emerging ATSC-capable mobile devices. Part 3 of A/153 defines the system service multiplex and transport subsystem characteristics, which include the definition of an optional "interaction (return) channel" for interactive TV services. Mobile DTV is agnostic to the type of return channel, which could be a local Wi-Fi network or other wireless service. Although optional, this interaction channel must conform to the ATSC A/96 specification discussed earlier. Because the primary objective of the ATSC Mobile standard is to define the delivery of video and audio services, a specific method or middleware for handling applications is not currently described. The A/153 standard does, however, provide a framework for the delivery of auxiliary (graphical) components, based on the Open Mobile Alliance Rich Media Environment (OMA-RME) specification, written specifically for mobile devices.

In its report on mobile TV use cases, the Open Mobile Video Coalition (OMVC) envisions a variety of interactive TV features, including: interactive polling, interactive overlays, chat sessions and E-commerce.

As mobile devices become more common, interactive TV services will migrate from the home TV to mobile platforms, with a seamless integration of broadcasting and Internet applications. BE

Aldo Cugnini is a consultant in the digital television industry.

Send questions and comments to: aldo.cugnini@penton.com

Video network security

A security policy should drive the design and implementation of critical networks.

BY BRAD GILMER

Now more than ever, computer networks are a critical component of our facilities, and the security of these networks is paramount. For the next two months, this column will focus on this important topic. This month will look at how to develop a security policy that drives design and builds decisions for secure IT networks. Next month, we'll look more deeply into firewalls, virtual private networks and other technologies that can enhance network security.

What is your security policy?

If you were going to build an edit suite, how would you go about it? You would collect user requirements, develop design documentation, purchase the equipment, install and test the facility, and then hand it over to post production. You would then monitor the suite and fix any issues that come up. When you think about it, to design and build a secure computer network, you follow much the same process. But before you invoke this process, I strongly suggest asking a few questions and then using the answers to develop a security policy. This security policy will drive many fundamental decisions about your network design.

• *Do you have an existing corporate IT security policy?* I know that many of you struggle with corporate IT support, and this is understandable. Frequently, corporate IT people do not understand the intricacies of video networks. That said, perhaps there are parts of your corporate IT policy that can be adapted to the technical facility. An ideal situation would be to find the person who wrote the policy and ask him or her candid questions about each element in the policy. Treat this as a learning opportunity. At the end of the day, there may not be anything useful in a corporationwide IT policy written for the office environment. On the other hand, there may be some vital information that should be included in a policy for a technical area. Besides, if you work in a corporate environment, it is likely you will need to operate within that corporate IT policy or know how to get exceptions to it when needed.

When developing your security policy, consider whether automatic software updates should be permitted. Automatic updates can create instability in the computing environment.

• *Are you going to require user authentication to use computers on the network?* Your first inclination might be to say, "Of course!" But take a moment to contemplate this issue. Any security measure comes with a burden. Remember that every time someone logs on to a system, it takes time to validate that log-on request. In an on-air environment, would that log-on time cost you money? Do you already have physical security in place where a log-on requirement would be redundant? On the other hand, is it important to know who is logged on to the system at any given time? Will you use logs and audit trails to research failures or mistakes after the fact? If this is the case, think again about how you see authentication actually being used in the facility. For example, does everyone in your master control area use the log-on name "master" and the same password? If so, is there really a benefit in having the authentication requirement at all?

• *Are you going to allow access to the Internet from your media facility network?* Are there technical reasons why you will be forced to allow this access? Again, the answer may seem obvious — either yes or no. But carefully consider your answer. If you decide to disallow Internet access, people will be lining up at your door asking for exceptions before the network installation is complete.

• *Will you allow automatic updates of software?* I believe that you should not

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permit automatic updates of software in a technical environment. Why? Because automatic updates create instability. That said, many times software updates are released to address security issues, so this is a double-edged sword. On one hand, you want to ensure that systems are patched to the latest level for security reasons. On the other hand, you do not want to have a system auto-update and then quit working. So I believe the best way forward for technical platforms is to disable automatic updating, but make updates part of a regular maintenance plan. Bear in mind that it is wise to thoroughly test updated systems to ensure that they are working properly before returning them to service.

• *Will clients be allowed to bring in laptops that they can use to access the media facility network?* This is a critical decision. In a master control environment, the answer is likely to be no. In fact, you can use MAC addressing on the routers to keep people from plugging in a rogue computer. However, in a post environment, it is customary for clients to want to bring in their own laptops. These people spend a significant part of their day away from their desks. Not allowing them network access is impractical, especially if these clients are out-of-house. Establish a separate client wireless network in your facility, granting them access to the Internet but prohibiting them from accessing your core technical network.

• *How many networks do you anticipate having in the facility, and what will they be used for?* While it is nice to talk in theory about a single technical network and a single business network, anyone who has worked in a facility knows that real life is not like that at all. No one may actually know how many networks are in the facility. As you develop the security policy, it can be helpful to have a good idea of how many networks there are and to think about how and where these networks will be joined. Clearly, implementing security at the point where networks join is a key concept and should be addressed in the security policy.

• *Will you allow clients to use USB drives or other removable media?* Did you hear about the company whose security was hacked by someone who left USB drives scattered in the parking lot? The hacker was clever enough to know that people would pick up the drives and use them, and also was clever enough to infect the USB drives with a virus that allowed the hacker to take control of the computers from outside the company. USB drives are a great convenience, but in a mission-critical environment, it may be best to disable them.

• *Are there network protocols that*

you will specifically not allow on the network for security reasons? Certain protocols such as telnet, FTP and HTTP are inherently insecure. Does it matter to you that someone with a packet sniffer can see what you are sending across the network? If it does, then you may want to insist on using secure versions of these protocols (SSH, SFTP, SHTTP) and to block the transmission of unsecure protocols across the network. But beware: Many manufacturers assume that common protocols will be supported on the network. Certain products may not function if these protocols are blocked. A better approach may be to block these protocols at the firewall.

- *Will you employ monitoring and logging on the network for security purposes?* If so, what level of monitoring is appropriate? Intrusion protection systems (IPS) can be used to monitor network traffic for behaviors that are typical of a security breach. While IPS is a great tool, it requires configuration and maintenance to be successful. A policy that includes the inspection of all server and router logs on a daily basis is an extremely good idea. Not only will this alert you of security issues, but it will also allow you to see problems as they are developing, frequently before a fault occurs.
- *Are you concerned solely about external threats, or are you also protecting the facility from internal threats?* This is pretty simple: If you are only considering external security threats, then you have an insecure system. As you develop the policy, consider the impact of internal security threats as well.
- *What are the ongoing training, maintenance and administration impacts of decisions you make regarding network security?* There are a variety of security systems out there, many of which impose a substantial burden on the organization in terms of ongoing training, maintenance and administration. Be sure to consider the costs of security technologies and policies as well as the benefits when developing the security policy.

Conclusion

I hope that this column gets you thinking about how important a security policy can be as you contemplate the design and construction of a new network. It is imperative to have a security policy. Don't just think about developing a policy; write it down, share it with your colleagues, modify it as you see fit, and then publish it widely within your organization. BE

Brad Gilmer is president of Gilmer & Associates and executive director of the Advanced Media Workflow Association.

? Send questions and comments to: brad.gilmer@penton.com

Automating graphics

Automated branding and promo systems can respond quickly to schedule changes.

BY PETE CHALLINGER

Effective branding and promotion graphics are vital to channel differentiation. These days, however, they present a real challenge. Typically such graphics are prepared manually and then submitted to the transmission chain. Items such as promos are built in a nonlinear editor and then loaded onto the video server for playout. These approaches are laborious, time-consuming and costly. With tight budgets for promotions departments, managers find themselves in a tough spot.

We can, however, take advantage of the data available across the network to create an automated system for producing and playing interstitial, branding and promo graphics. (See Figure 1.) Three core sources of information are available as a starting point:

- The "live schedule" from automation that details the next 24 hours of playout;
- The "day schedule" from traffic that looks two to three days ahead;
- The "listing schedule" from traffic that is used for EPG, print and online schedules.

A server-based automated system reads the metadata from these systems to create its own consolidated database of the upcoming schedule. In addition to schedules, finding more information related to programs, events, sponsors, etc., can lend greater flexibility for populating graphics. Simple data entry would enable the additional information to be made available.

An automated promo system will use this, for example, to see the next program coming up. It identifies the program via metadata, such as material ID, and searches its database for the correct title it needs to put to air.

In addition to metadata, assembling graphics requires the integration of several components including a set of graphics templates, prepared forms that have fields for text, images, logos and video clips. Those elements will be filled in by the graphics system based on the decisions taken by the automated promo system. The automated promo system will have a control link to the graphics system to enable it to build graphics using the

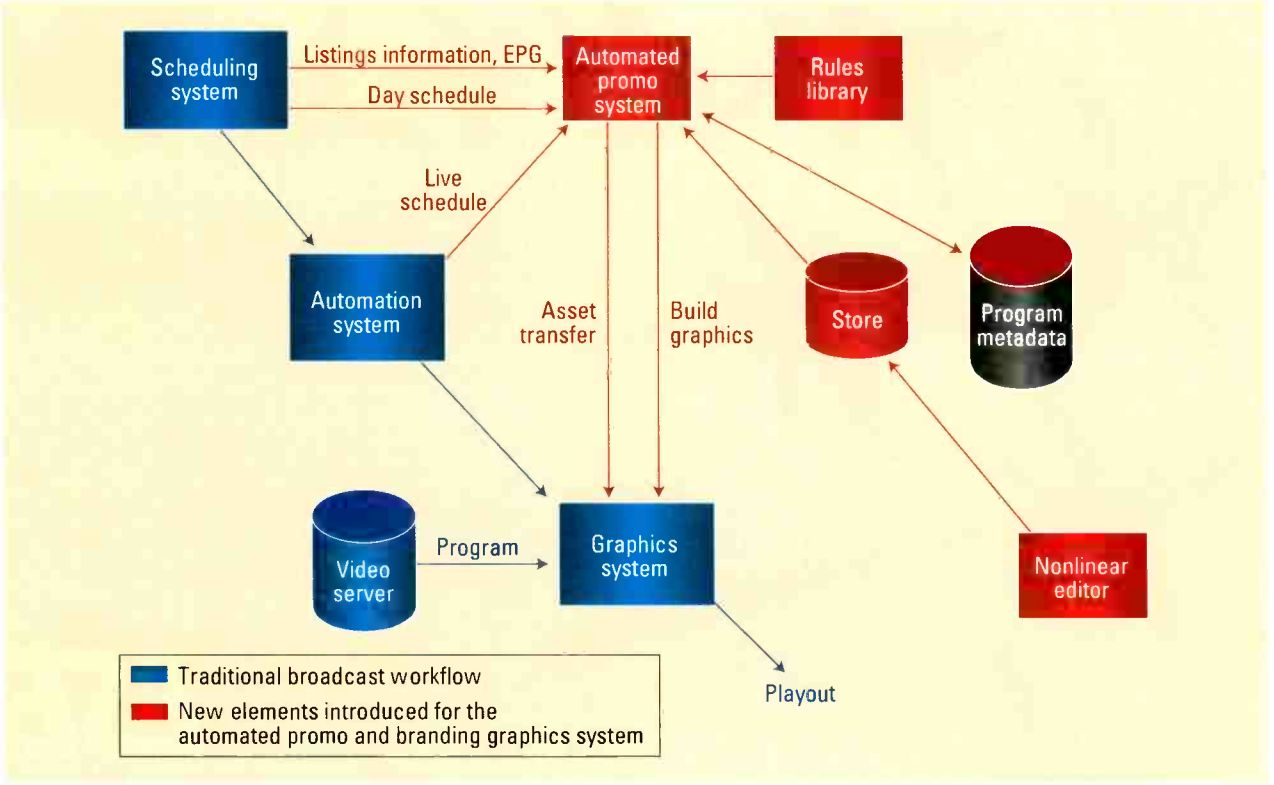

Figure 1. In this figure, the blue elements represent a traditional broadcast workflow. The red elements represent new parts introduced with an automated promo and branding graphics system.

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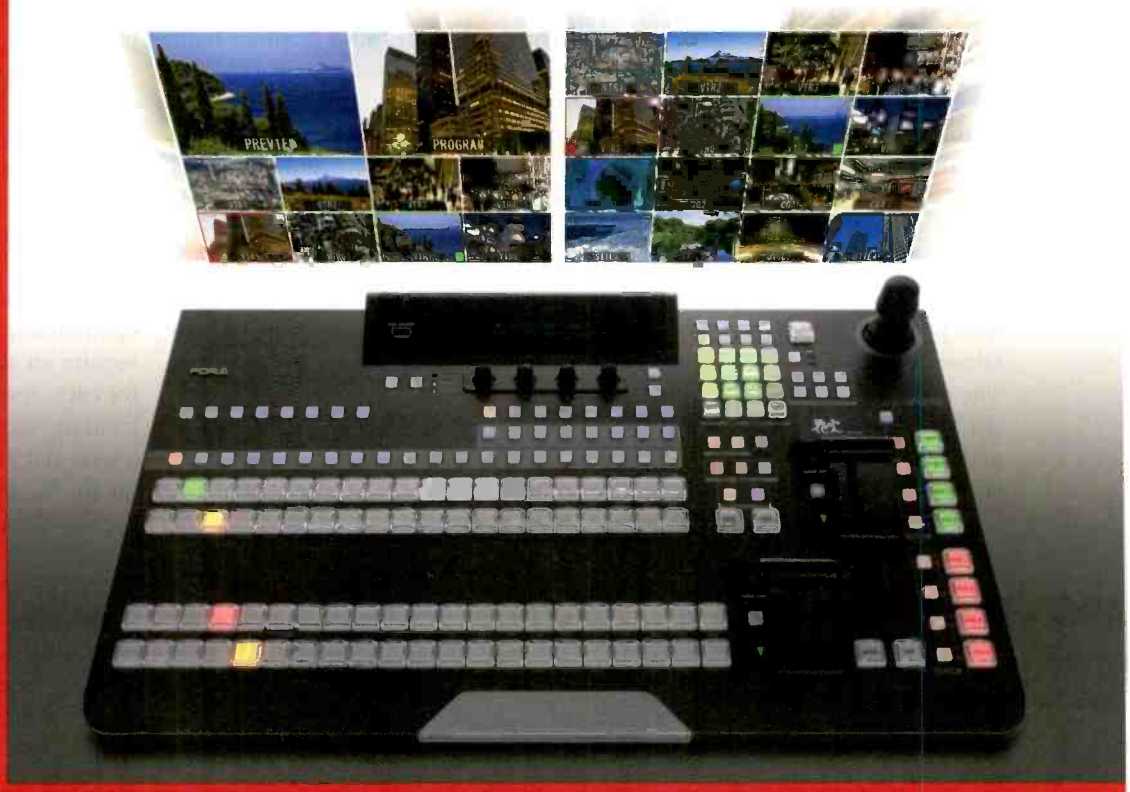

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template. The system will also need a set of governing rules.

For example, consider a typical in-program pointer (IPP) such as a lower-third "Next Up" snipe, which we'll call IPP1. IPP1 is listed in the scheduling system for playout at the appropriate time. The automated promo system sees that, and then looks into the automation schedule to see the next program and checks its own database for the full title information. The system uses its rules to populate the fields in the template, such as title and time. At air time, the automation system will call for that automatically produced graphic from the graphics system, and the system will overlay the snipe on the program stream and play out.

An operator is no longer required to piece together the graphic. By eliminating the manual labor, broadcasters have gained the flexibility to make changes to the promo graphics right up to playout time because a change in the schedule automatically updates the graphic.

We can go beyond program data with interfaces to any number of additional sources of data: news and sports, weather forecasts, stock and exchange rate data, SMS messages, RSS feeds, e-mails, etc. These sources can be polled regularly by the promo system, or they can push their data to watch folders. This flexibility lends itself to the creation of sophisticated graphics that can give a channel a distinct character.

This setup also lends itself to multilingual promo requirements. Simply add fields to the metadata database for each language. The same ID on the scheduling system will then trigger multiple versions of the graphic for each language, including the appropriate country voice-over.

The program metadata database can be expanded further with things such as video clips to create upcoming program menus with moving video. In the past, assets such as clips were stored on the main video server and played into an auxiliary input on the graphics system with a squeezeback to open the clip in a window. This would require an additional, expensive port for each desired simultaneous output from the video server. It also requires a secondary video event in the schedule for the server, increasing work for the scheduling staff and adding considerable complexity.

Instead, we can use a clip player on the graphics system. Those assets can be stored on a low-cost central SAN, NAS, server or even on the same server that runs the automated promo system.

The scheduling system need only issue a single instruction for the predefined graphic. The automated promo system will use the information it has in its database, gather the appropriate metadata from its metadata store, get the times from the scheduling system and populate the template on the graphics system, which will be recalled by the automation system at the correct playout time.

Watch folders on the central store are monitored by the automated promo system, which then matches it to its metadata database and can manage the movement and life cycle of those assets. The same system should manage the deletion of assets that are no longer immediately needed from the clip player. An advantage is that if a system needs to be swapped for any reason, the automated promo system can automatically repopulate the replacement clip player.

So who benefits from an automated promo system? Stations that have a stable schedule with few last-minute changes, such as movie and thematic channels, can deploy a relatively simple system that builds automated graphics sequences based on schedule analysis and file processing. Such a system would support the need for automated "Next up" graphics, menus, lineups and automated versioning of audio and video assets.

If a broadcaster needs to make changes close to or at air, it is necessary for the system to maintain a live connection to both master control automation and a central store for assets. This system would build graphics within seconds of air, so it can also include up-to-the-minute information from a variety of data sources.

In its most advanced implementation, an automated promo system is capable of running a complete channel with the ability to create interstitials on the fly based on rules to evaluate context and using an extensive range of data sources both internal and external. This solution has no impact on station automation. Instead, it monitors the live automation schedule and automatically generates a sequence of sufficient duration to match a given gap in the schedule.

Deploying an intelligent automated promo system that collects data from numerous sources and uses that information to populate templates on a modern graphics device is an elegant solution that meets today's branding requirements with complete sequences, created on demand and in real time, with minimal or no human involvement. **BE**

Pete Challinger is CEO of Pixel Power.

Practical audio solutions

Lip-sync errors, 5.1 continuity and variable loudness levels can be addressed with the latest technology.

BY GUY MARQUIS

When you ask station engineers about the technical issues they face on a day-to-day basis, it seems that the same bunch of audio problems keep cropping up. The top three problems will typically be lip-sync errors, maintaining the continuity of 5.1 and stereo audio and excessively variable loudness levels. The good news is that these annoying and recurrent audio issues can now be convincingly tamed using a mix of highly practical, new technologies that are readily deployed.

Measuring and addressing lip-sync issues

Lip-sync issues are common in broadcast and have their roots in the different processing time required for video and audio content. This difference is even more pronounced with the move to HD and 3Gb/s. Although video equipment is designed to manage the different video and audio delays, lip-sync problems can emerge down the playout chain as signals pass through various devices from different vendors.

Traditionally, it has been difficult to trace the emergence of lip-sync errors during TV playout, and subsequently at the set-top box, while a channel is on-air. Digital fingerprinting, however, now offers an elegant solution to identify, measure and trace lip-sync errors. The technology is based on a comparison of the video between a reference source without any lip-sync problems and other points in the playout chain, where lip-sync problems may emerge due to processing delays. For example, lip-sync testing points may be established at an incoming feed, after branding and closed-captioning/VBI insertion, at the exit of master control and when checking off-air feeds.

Typically, the process is performed using a probing module, which analyzes signals at both points using a non-intrusive fingerprint generator engine. This operates on a field-by-field basis to generate a number that is unique to the video or audio content for that field. With this numeric data, the probe can then make sure that the content is the same at the source and destination. This allows the system to check for content mismatches, such as video and track swaps, as well as pure lip-sync errors. A probe can check all 16 audio channels and report any lip-sync errors within plus or minus 1ms. Every channel will get its own fingerprint to allow measurement of any phase shift between the audio channels. (See Figure 1.)

A key advantage of this digital fingerprinting technology is that it allows content comparison across different video and audio formats. For example, it can compare an HD 1080i or 720p signal with audio from a broadcast facility's master control room to a signal received in the home using an SD set-top box. (See Figure 2.)

These lip-sync measurements can

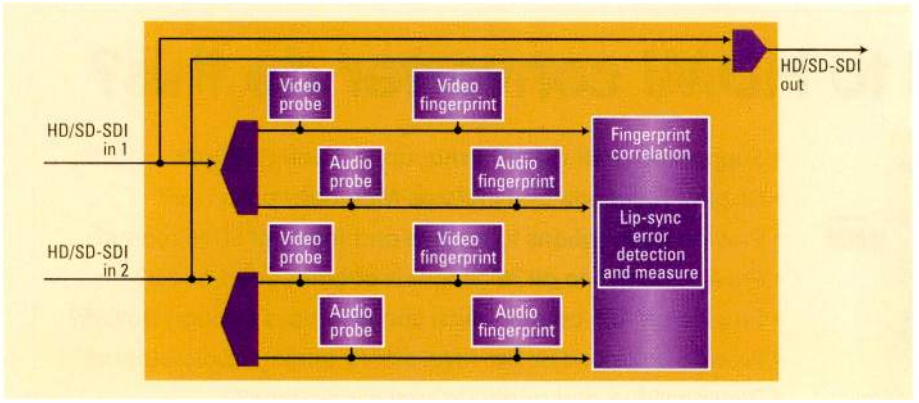

Figure 1. A digital fingerprinting probe allows content comparison across two points.

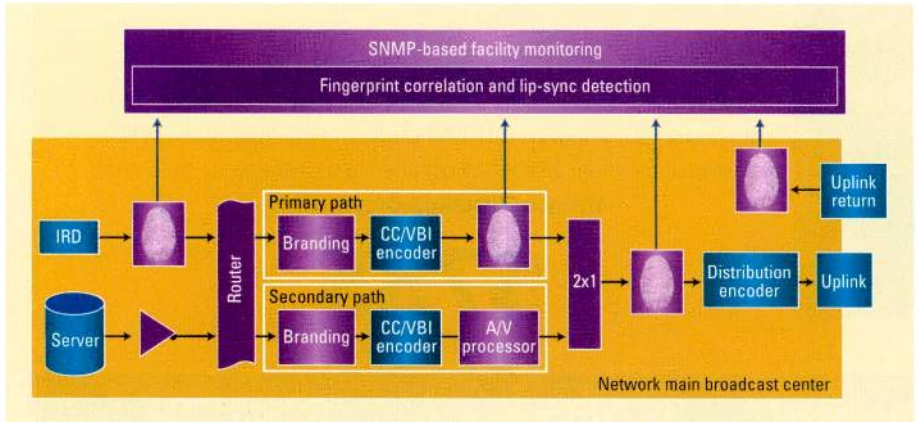

Figure 2. Shown here is an example of end-to-end lip-sync monitoring using digital fingerprinting.

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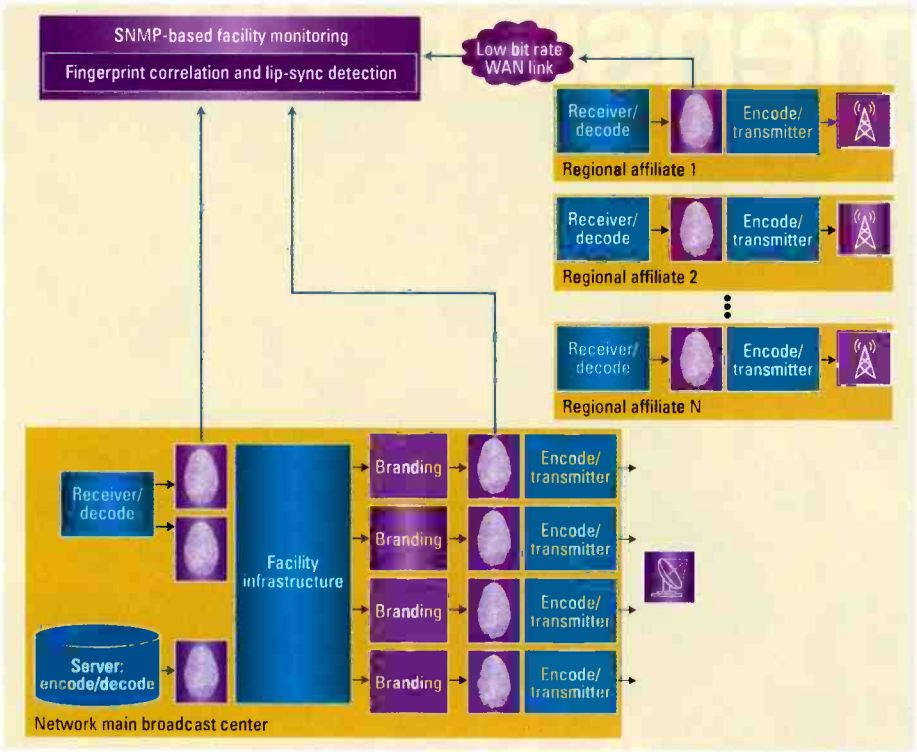


Figure 3. Lip-sync monitoring can feature digital fingerprinting across multiple network affiliates.

be monitored over IP, using a WAN or LAN, with an SNMP-based facility monitoring system, and any errors can be immediately flagged for remedial action. This would typically involve the operator making a delay adjustment directly from the facility monitoring desktop interface using the channel's signal processor. This highly flexible, end-to-end lip-sync monitoring process can be used for multiple TV channels across multiple sites and also is well-suited for applications such as TV network affiliate monitoring. (See Figure 3.)

Digital fingerprinting is still in the early roll-out stage, and it is currently based on proprietary solutions; however, SMPTE has taken note of the considerable potential of the technology and is investigating the possibility of producing a SMPTE standard for the fingerprint signal and the methods of metadata carriage, with the review

being performed by the SMPTE TC-22TV-01 AHG Lip Sync Committee.

Maintaining the continuity of 5.1 and stereo

Traditionally, delivering both 5.1 and stereo programming simultaneously has proven problematic. A typical viewer complaint is inconsistent 5.1 delivery to the surround speakers, which is often caused by ineffective upmixing when moving from a 5.1 to 2.0 signal. This can happen when broadcasters are playing out a mix of newer 5.1 content and legacy 2.0 content. While this type of problem may not be a full-on broadcast emergency, it's certainly not the high-quality acoustic experience broadcasters strive for.

Fortunately, this can now be addressed with a simple, and relatively low-cost, set-and-forget modification to the playout chain. The latest generation of signal processor modules is equipped with integrated up- and downmixing capabilities, and these can be configured to automatically respond to the incoming signal. Whenever a 2.0 signal is received, it can be passed and also upmixed to 5.1. Similarly, when a 5.1 signal is received, it can be passed and also downmixed to 2.0. These automatic responses prevent problems like inconsistent 5.1 and 2.0 audio.

The dialnorm route to loudness control is not practical for many broadcasters because they cannot reliably pass the metadata to their AC-3 encoders.

Loudness control

The last of the three audio problems, controlling excessive loudness variation between channels and between program segments, is perhaps the most high-profile issue at the moment. Loudness variation is especially evident during commercials and promos and quickly gets tiresome for viewers.

This situation has been around for a long time, and you may recall that dialnorm was created to prevent this problem. Dialnorm metadata is designed to allow content to be mixed to different loudness levels and for the audio receivers to compensate for the differences by applying a normalization based on the metadata. Unfortunately, the dialnorm route to loudness control is not practical for many

broadcasters because they cannot reliably pass the dialnorm metadata to their AC-3 encoders. This sometimes arises because metadata is missing in the content they receive or because their playout chains incorporate many different generations of equipment, and metadata transmission issues can lead to missing or incorrect values. These metadata errors can make loudness jumps at the home even worse than they would have otherwise been.

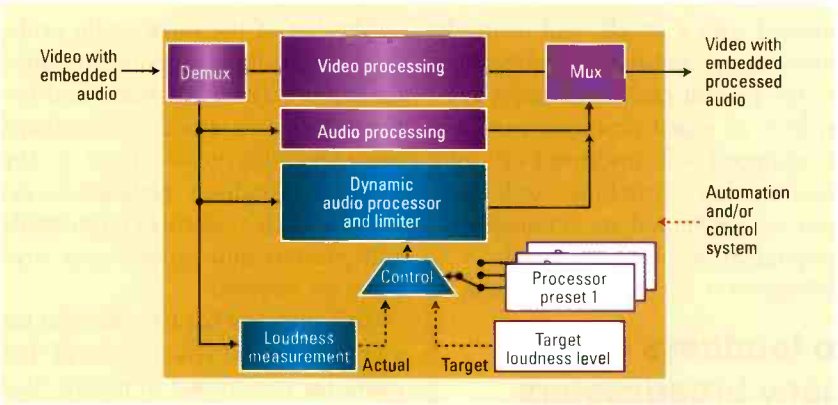


Figure 4. Core functions of a signal processor module with integrated loudness control include loudness measurement and dynamic processing.

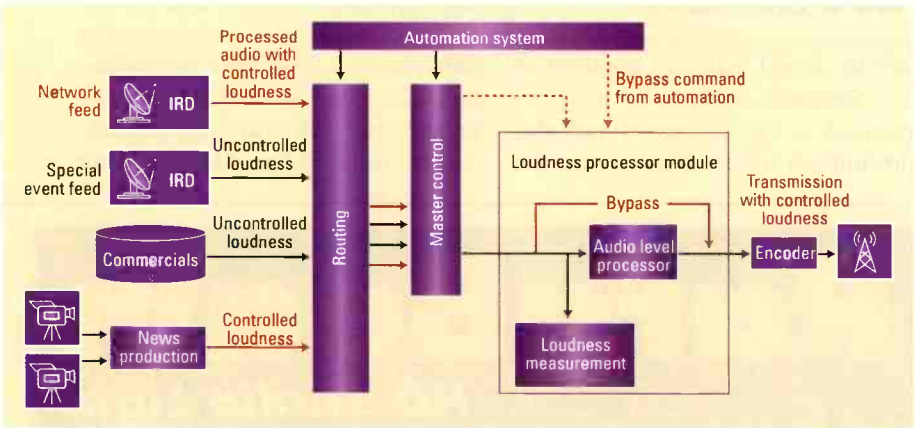


Figure 5. Loudness processing can be bypassed by a network affiliate, using segment change cues from playout automation, to process audio with uncontrolled loudness.

There's real impetus now to fix this problem. The ATSC has published the A/85 recommended practice, which proposes as an alternative to agile metadata the use of a fixed dialnorm value, set at the encoder, to ensure that all content matches that target loudness. However, while this is great for content produced in house, broadcasters tend to receive a lot of their content from third parties, and they need new tools to ensure it matches their target loudness.

To meet this requirement, a number of equipment vendors are now offering loudness control processors, and there are multiple approaches available involving multiband and wideband audio processing solutions. This technology can be delivered as dedicated boxes or as space-efficient options for signal-processing modules. The best solutions now offer very smooth loudness transitions, without sudden dips in level, or pumping effects, which have traditionally been prevalent with automatic gain solutions.

Signal processors with loudness control include features like loudness measurement using ITU-R BS.1770 to assess any deviation from the target loudness, as well as a dynamic processor that can adjust levels on the fly, and a controller that is much more sophisticated than traditional gain control. (See Figure 4.)

The most common way to implement loudness processing has been to use a set-and forget-mode of loudness control, with the loudness processor maintaining a target loudness without any ongoing operator involvement. To optimize the processing, facilities can choose a processing profile that's the best match for their type of content. Profiles are available for music, talk and many other types of programming.

Set-and-forget operation can deliver great results, and it's easy to install and use on a daily basis. However, for some specific types of channels, a more active style of control can work even better. This is especially true for channels that air movies and drama programs, where large and rapid loudness changes contribute to the dramatic effect. With set-and-forget operation, the loudness processor has no way of knowing the difference between a sudden audio transition within a program and an audio transition caused by a change of segment, such as a commercial break.

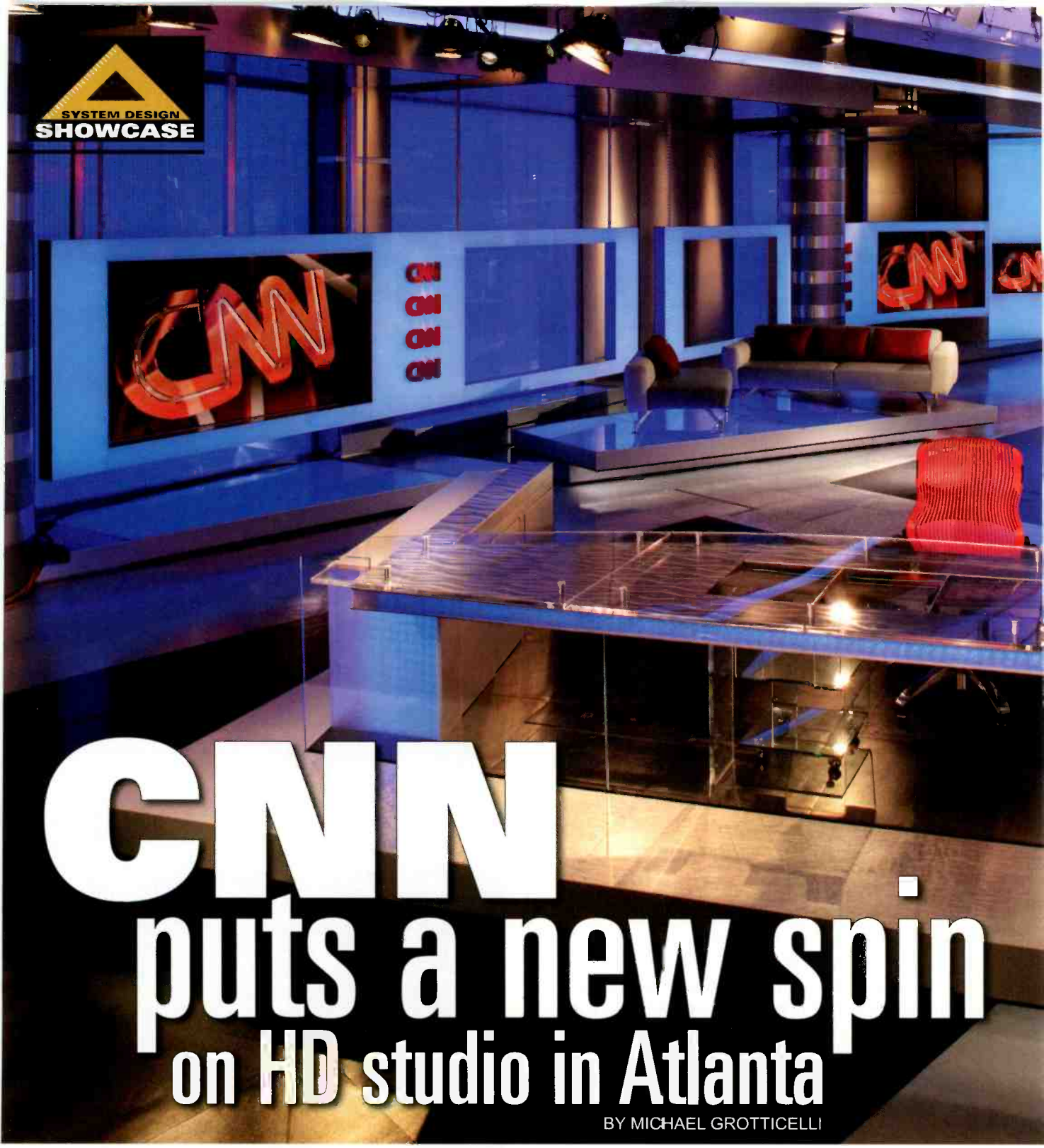
In these situations, it can be beneficial to use segment-aware processing with the loudness processing profile controlled by a simple segment change cue from playout automation. For known segments with the correct loudness level, the loudness processing can act in a bypass or light processing mode, which can help protect against downstream clipping. For commercials, live segments and feeds from outside the facility, the loudness processing can act in a faster-reacting correction mode.

Playout automation-driven loudness processing can also be advantageous for network affiliates, which need to pass preprocessed network content as well as locally created news content and commercials. In this case, the loudness processing can be bypassed when the network feed is passed to avoid any changes to the content, and it can be engaged for the local content with uncontrolled loudness levels. The net result can be a natural, high-quality audio experience free from excessive loudness variation. (See Figure 5.)

Conclusion

All those pesky lip-sync, loudness and 5.1 continuity issues can now be addressed effectively using relatively simple fixes and without too much investment. All these audio issues should become a thing of the past before too long. BE

Guy Marquis is infrastructure senior product manager for Miranda Technologies.

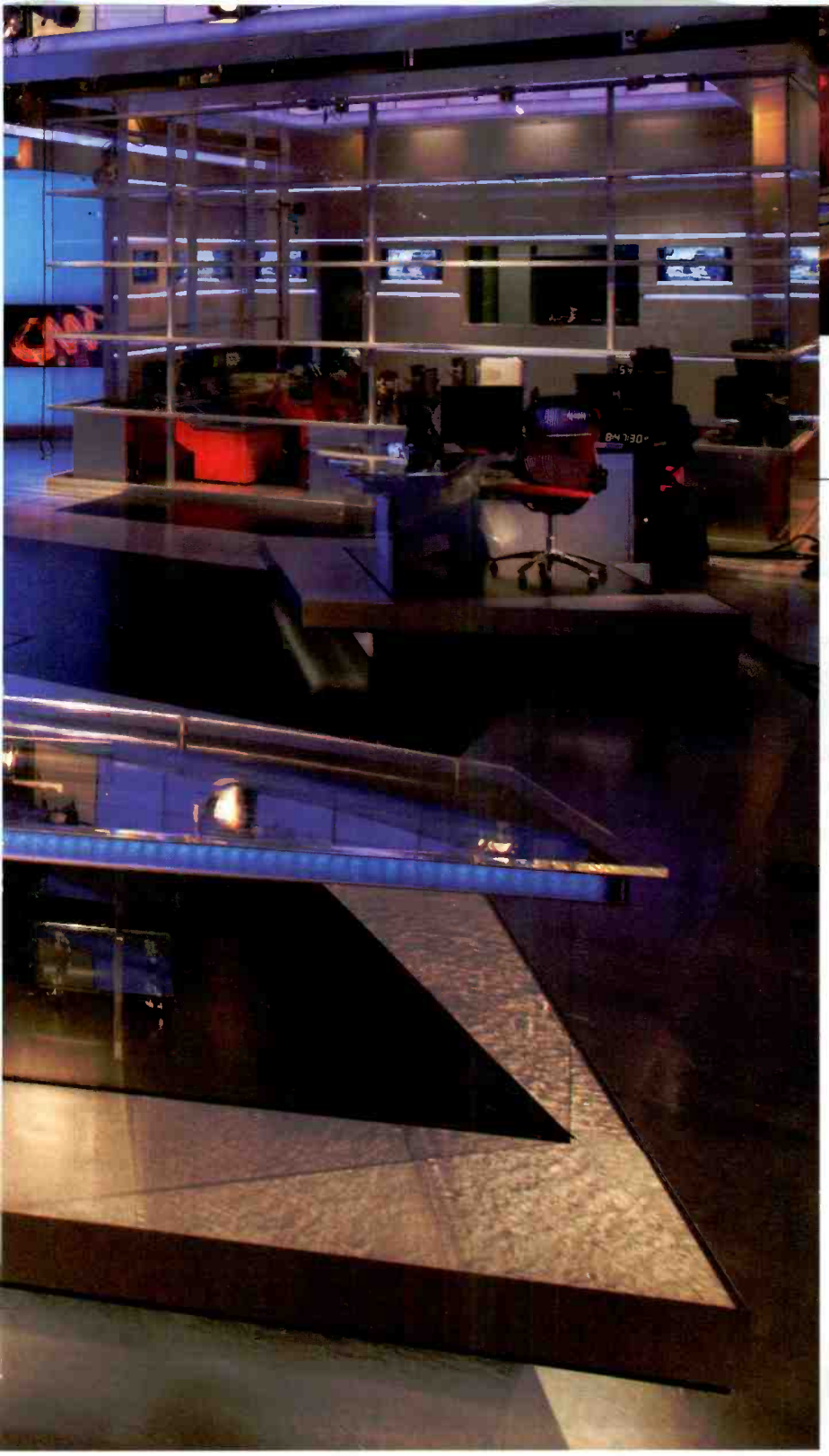


CNN puts a new spin on HD studio in Atlanta

BY MICHAEL GROTTICELLI

After systematically building state-of-the-art HD production facilities in New York City; Los Angeles; and Washington, D.C., over the past three years, CNN has turned its attention to its original home and main headquarters at CNN Center in Atlanta. On May 3, the all-news network unveiled a new studio with all of the traditional HD production equipment one might expect, as well as a few technical surprises.

Now all of CNN's domestic programming (as well as some programming on HLN) will be distributed — via cable, satellite and telco television service — in the 1080i HD format. The new studio and the associated tapeless newsgathering operations at all of its facilities will be supported in the field by nearly 20 HD microwave trucks and more than 100 photojournalists, who all shoot in HD. (There will still be a lot of SD material from international bureaus and archived material used that will be upconverted before going to air.)



The main studio features a rotating anchor desk that moves 270 degrees and allows the talent to shoot various interviews with different backdrops or minisets installed around the four walls of the studio. All photos courtesy Ted Pio Roda/CNN

The new 5000sq-ft studio in Atlanta is more than three times the size of the network's existing anchor desk and weather set combined, making it the largest studio to date for CNN. It includes a rotating anchor desk that allows the crew to use Sony HDC-1400 HD studio cameras with Fujinon HD lenses to shoot various interviews with different backdrops or minisets installed around the four walls of the studio. There are five cameras in the studio on Vinten Radamec robotic pedestals, as well as one handheld on a steadycam rig and another on a mechanical jib camera. Sony XDCAM HD cameras with Canon lenses are used in the field.

Flexibility to do more

The main design concept was to make the studio as flexible as possible to accommodate a wide variety of news segments and individual programs. One large wall features two 103in Panasonic HD plasma screens on a motorized track suspended from above that can be moved to serve as a background as the rotating desk moves. One screen is equipped with a touch-screen overlay called "UTouch," which allows the on-air talent to manipulate graphic elements. The weather center set features a separate large screen running Perceptive Pixel software that allows the on-screen talent to expand an image with their fingers (which CNN pioneered on-air for the 2004 presidential election). There's also a Christie Digital HD projector for some weather segments, used to display WSI weather graphics, and three other Christie HD projectors blended together to display animations, live video and graphics behind the main set.

One screen is equipped with a touch-screen overlay called "UTouch," which allows the on-air talent to manipulate graphic elements.

The main set itself includes more than two miles of LED lighting (made by NileStrip and Boca Flasher in Florida), which can be used in a variety of ways to create alternate moods and

All new segments for HLN and other programs shot in the new studio will come out of Control B, complete with a Sony MVS-8000G HD production switcher and a multiscreen monitor wall running Evertz MVP multiviewer software.

ambiance. The crew can also project all types of animations across the entire backdrop or focus on specific sections of the stage.

The engineering department has also made it possible for the anchors' laptops to be taken directly to air, so they can support their stories with social media and the Internet when necessary.

Reporting in the round

The innovative anchor desk rotates 270 degrees. It was designed by CNN's in-house engineering group with help from theatrical scenic design company Clickspring and engineering design assistance from BEST. It's powered by a series of chains, high-intensity cable and gears that can be rotated during commercial breaks to change the on-screen look. The stage moves to a series of predetermined locking points for each individual segment. The design facilitates a variety of different camera angles and backdrops, but it was technically challenging to implement.

The real challenge was to figure out a way to move all of that chain and set cabling without it getting pinched or crimped every time the stage is rotated. In early tests, the system has worked perfectly.

Solid foundation for HD news

In 2007, when CNN launched HD operations in New York, the Atlanta facility was also equipped with a new master control system to handle the extra-bandwidth HD programs and send them out to viewers with HDTV sets. In 2008, new Grass Valley Trinix HD routers (one central router features a 1024 x 1024 matrix) and HD servers were installed in Atlanta, and in October 2009, the first HD control room ("B") went on-air for a small amount of programming.

All new segments for HLN and other programs shot in the new studio on the seventh floor will come out of Control B on the fifth floor, complete with a Sony MVS-8000G HD production switcher and a multiscreen monitor wall running Evertz MVP multiviewer software.

When the new digital record and edit system launches later this year, everything will be captured and distributed in native 1920 x 1080i HD resolution, with a 16:9 widescreen aspect ratio. Some SD content will appear with sidebars to fill the screen when necessary.

The entire facility is supported by an internal IPTV network that allows producers, journalists, editors and

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An internal IPTV network allows producers, journalists, editors and engineers to view a variety of live TV channels and incoming feeds from any computer in the building.

engineers to view a variety of live TV channels and incoming feeds from any computer in the building. An Enseo decoder box sits on every desktop to display the channels.

Audio gone MADI

All the Sennheiser microphone and IFB sources are transferred between the seventh floor studio and the control room on the fifth floor via the MADI protocol over coax cables, which reduced installation costs. Surround sound is synthesized for some programs before final broadcast, but all audio is handled as stereo internally. Programs are mixed on a Euphonix Max Air digital audio console.

A new era for CNN

The new studio is a departure from the single, large anchor desks of old and moves CNN into a new era that incorporates new media technology to tell the story in more interesting ways. It also targets a younger audience whenever appropriate by allowing the talent to roam around the set.

There was a time when some questioned the need for newscasts to go HD. At CNN, there's no question it is a critical part of staying competitive. It now has the space and the technology in Atlanta to do it right. BE

Michael Grotticelli regularly reports on the professional video and broadcast technology industries.

Design team

CNN:

Bob Hesskamp , SVP, engineering
Matthew Holcombe, VP of network support, engineering
Jeff Paquin, dir., proj. management office
Guy Pepper, exec. dir., production design
Dave Slack, VP, proj. management and ops.
Jack Womack, SVP, ops. and admin.
Anne Woodward, VP, technical ops.

Technology at work

Canon HD lenses
Christie Digital HD projectors
Enseo decoder boxes
Euphonix Max Air audio console
Evertz
- MVP multiviewer
- Signal processing modules

Fujinon HD lenses
Grass Valley Trinix HD routers
Harris Infocaster digital signage system
NileStrip LED lighting
Panasonic 103in plasma screens
Perceptive Pixel software
Sennheiser wireless microphones
Sony
- HDC-1400 HD studio cameras
- MVS-8000G HD switcher
- XDCAM HD field cameras

Vinten Radamec robotic pedestals
WSI weather graphics

HP offers collaboration on every level

With the amount of distribution platforms increasing and staff consolidation a present day reality, Stephen McKenna, vice president of HP's Media & Entertainment division, is focused on serving the growing need for more simplistic (cost-effective) and industry standard (open) approaches to complex workflow problems. He's now helping some of the world's largest production companies and highest profile content owners to design and build flexible, file-based infrastructures that can adapt to changing business models while bringing customers a fast return on their investment.

HP's Stephen McKenna is helping media organizations large and small manage their data and increase productivity.

Q: *What challenges does the market face and how is HP equipped to overcome them?*

A: Everything has moved to a file-based workflow and this something HP understands implicitly. Large organizations have to distribute content to many platforms simultaneously in order to keep their businesses competitive and successful. We have to make the processes more non-linear and more automatic. We need to streamline the business processes that help drive revenue.

I think HP is uniquely qualified in this new world of file-based media to help media professionals because we have a vast collection of resources within our company that offer real-world experience to get the job done. They've completed a lot of different kinds of media projects, so they know what they are doing and can advise customers accordingly.

When it makes sense, we're also forming strategic partnerships with venders that have expertise in a specific area or understand a piece of the overall puzzle. HP is open and welcomes collaboration. We welcome customer suggestions, as far as the types of tools they want to work with, and we're doing our best to implement those tools into an overall workflow that helps improve productivity for our customers.

We understand file-based workflows and we also know that to be successful, we have to be a good listener and design systems that solve the individual problems a customer has. At the end of the day that's one of the things that's what's most important to our customers.

Q: *Beyond the hundreds of individual products (workstations, servers, storage, etc.), HP offers a number of services that can be used to host content off-site or deliver multiple streams to different platforms without the client's help. Explain why this is important to your business.*

A: With its product lines and computer networking experience, HP has assumed a larger role in all types of media production installations. We're talking about non-proprietary platforms and off-the-shelf hardware that allow users to work the way they want to work.

The industry has seen a lot of contraction and downsizing of staff in recent years, yet media companies still have to produce a lot of content and distribute it to the end user quickly or they are out of business. Many customers are asking HP to help them with off-site services such as cloud-based storage, media management and even protecting copyrighted material against piracy, and we are working together with them to this end. These are just some of the areas where traditional media companies have reached out to HP as a trusted partner for these services, so they can focus on the creative side of their business.

We like to say that our goal is to help our customers migrate from 'media chaos to clarity through collaboration.'

At the end of the day the industry understands that we're more than just a technology solutions provider, we are a long-term business partner. ●

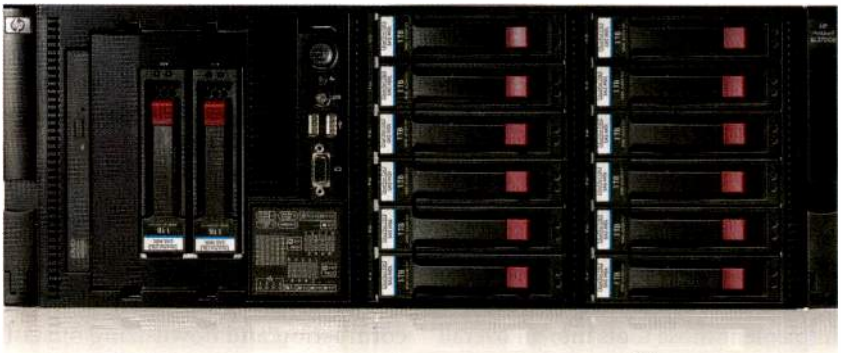
Navigate today's competitive media waters with HP

In their effort to be successful in an ever-changing and highly competitive environment, broadcasters and professional media companies are faced with more challenges than ever before. This includes having to sort through a variety of digital file formats, distribution platforms and consumer viewing habits that every content provider must take into account when planning and implementing an efficient workflow that makes the most of available tools and manpower.

The days of unlimited budgets, proprietary technology and large staff sizes are over. Companies big and small are now faced with having to do more with less.

Navigating this sea of seemingly unpredictable production variables can be time-consuming and expensive without a carefully executed plan and an experienced technology solutions partner that understands the unique needs of the media and entertainment industry and can provide cost-effective solutions to get the job at hand accomplished in the most efficient (and quickest) way.

HP has been helping media companies realize their goals for more than 70 years by providing its expertise and best in class IT solutions that offer flexibility to adapt to customers' unique requirements and the reliability that media companies demand to keep their businesses running smoothly.



The HP Proliant DL370 G7 server features room for several GPU cards, to imprcve a variety of image data processing tasks.

Through a variety of high-performance content digitization solutions and services designed for highly collaborative, heterogeneous and content-rich environments, HP solutions address the various processes and tasks involved in content creation, ingestion, digital asset management and content workflows. This allows users to support traditional production and distribution environments while also helping them to develop new business models that incorporate user generated content and social networking. HP's low-cost and easy-to-operate network-attached storage solutions are highly scalable and can grow as necessary. This way customers get the most value without overspending.

In addition, HP makes it easy for media organizations to deliver great service with its proven security solutions and strategies that reduce risk while maintaining easy access to desired content and mission-critical systems. The company also offers multi-layered and highly redundant solutions for the end-to-end management of a wide range of rich media archiving and IT infrastructure, as well as traffic and billing services.

More Than Just Technology Solutions: A Partner

Yet HP is more than just a technology solutions company. It also has worked hard to develop and maintain strategic relationships with well-known software providers that address specific parts of a collaborative, file-base workflow in the most innovative way. This is due to the unique flexibility of the HP platform, which provides the computing power to easily host complex applications.

At the NAB 2010 Show, HP's exhibit booth was filled with a variety of strategic ISV partner solutions that are helping customers implement their best chance for success. One such company is Elemental Technologies, based in Portland, Ore., whose GPU accelerated Elemental Server and Elemental Live video processing systems helps media companies automatically convert and distribute digital files in a wide variety of digital file formats, simultaneously and in real time.

The company's software takes advantage of NVIDIA GPUs to dramatically decrease the time it takes to encode and transcode files from one format to another. These

Sam Blackman, CEO of Elemental Technologies

next-generation GPU cards are installed inside a new HP Proliant server such as the DL370 G7, providing content owners and distributors with the easy accessibility and Dual or Quad core architecture necessary to make it happen. These users include broadcasters, online video platforms and digital media companies; who all use Elemental technologies software to reformat (encode) audio and video files for online and mobile distribution. It could be viewed on a cable set top box, a Flash-enabled Web site, an Apple iPad/iPhone or other smart phones.

The nice thing about the Proliant DL370 G7 server is that is has room for several GPU cards, so that Elemental Technologies' software is able to take advantage of multiple GPUs at the same time, significantly increasing processing speed. At the booth a single high-definition file was ingested into the HP server, using the Elemental software, and nine different digital formats (SD, HD, .mov, Flash, Windows Media, etc.) were output in real time.

"The key to the HP platform is that it offers really flexible chassis that have good support and sufficient power to drive multiple GPUs," said Sam Blackman, CEO of Elemental Technologies. "A lot of our customers have strong relationships with HP, so because our software is now certified to run on HP systems, it gives them a lot of confidence that the system will run smoothly and reliably. At the end of the day that's critical to broadcasters and HP's platforms deliver what they promise."

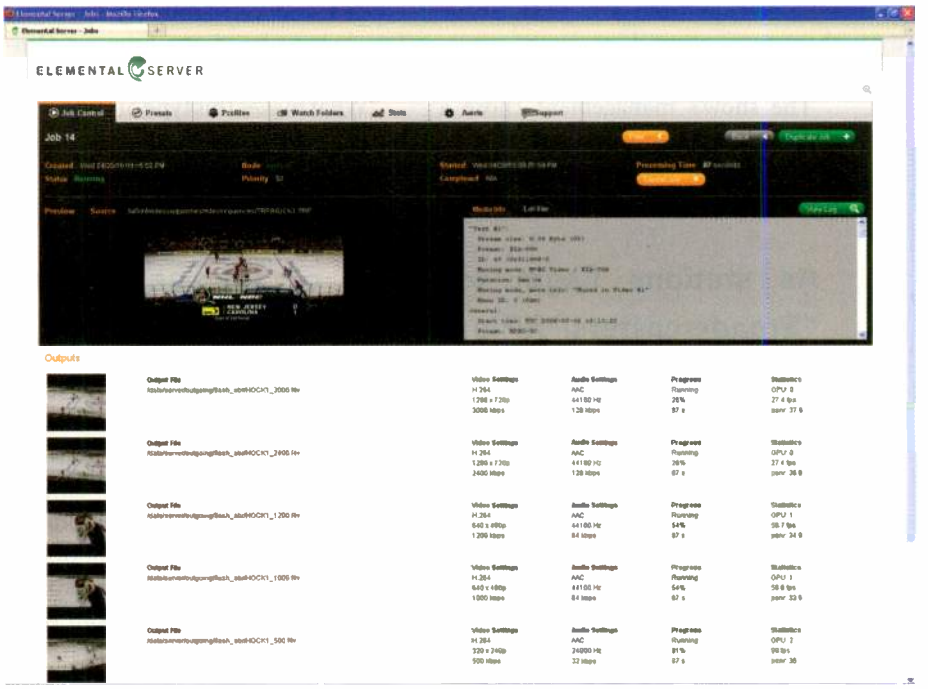
Because of the impressive results they have seen, Elemental Technologies has entered into a technology partnership with HP and has certified HP as a pre-configured hardware solutions provider for all of its customer installations. An example is News-Press & Gazette Company stations KESQ-DT, the ABC affiliate in Palm Springs, Calif. and KTVZ-DT, the NBC affiliate in Bend Ore., which incorporate a file-based workflow that includes the Elemental Server solution to transcode incoming satellite and Internet feeds for later playout to air. Multiple programs are handled simultaneously, increasing productivity and time to air.

"We like HP because the technology is easily deployed and very configurable, relative to the competition," said Blackman, "so it allows software applications like ours to work in a variety of ways to accommodate the many digital media distribution business models that exist today."

Collaborative Workflows Need Flexible Storage

Another key technology partner is Dalet Digital Media Systems, a provider of news production and asset management systems. Dalet and HP have supplied the main production technology for Warner Bros. Television's syndicated TMZ television show, airing on Fox affiliates across the country.

TMZ offers numerous short video clips during its half-hour program, and represents the new generation of TV newsgathering. One of the challenges of designing and installing a system robust and flexible enough to produce the pioneering rich media TV show was to devise a way to allow the staff to leverage the same fast,



Elemental Technologies' Server and Live video processing software takes advantage of multiple GPU cards to dramatically decrease encode and transcode times.

flexible, and lean production processes it uses to put together content for the TMZ.com website. This had to be a collaborative environment that could recognize any incoming format and allow the editors to search and retrieve clips from a large database, then turn around packages sometimes minutes before they go to air.

At KESQ, the ABC affiliate in Palm Springs, CA., Director of Technical Operations Jim DeChant (left) and IT Director BJ Daup have streamlined the workflow for both TV and Web-based programming with HP servers running Elemental Technologies' software.

The show's management chose a newsgathering and production system based on Dalet Enterprise Edition and several standard HP ProLiant servers along with a HP storage area network (SAN) and a HP tape library for archiving. Each day content is ingested, and then later quickly located and retrieved from the centralized HP storage array. A rough-cut edit decision list (EDL) is generated on one of the 90 Dalet workstations before it goes onto to a Final Cut Pro editor for HD finishing.

The XML EDL instructs the Final Cut Pro editor where to find the original material stored on the HP SAN. Once files are finished, they are sent back through the Dalet system where the show rundown is created and constantly updated before being played out from an Omneon Spectrum server.

"What makes this type of system interesting is the high level of flexibility and the ability to handle bandwidth intensive HD content quickly," said Benjamin Desbois, general manager of Dalet U.S. "The Dalet platform running on HP servers allows editors and producers to concentrate on the content itself and not the tools used to create that content. They can work as quickly as they want, which has allowed TMZ to run a very tight ship and produce content before many others in the market."

As stations begin to think of themselves as "Broadercasters," HP is proving that the best strategy is to offer open and industry-standard solutions.

Warner Bros. also employed the Dalet/HP combination with Avid NLEs for "The Ellen DeGeneres Show" which leverages HP ProLiant servers and HP storage.

It's All About Broadercasting

With competition coming from a wider variety of sources virtually every day, media companies have to get smart about the technology they use and how they choose to implement it. The continued use of off-the-shelf IT solutions like those from HP are clearly critical to success, resulting in better performance at much lower costs points. Another advantage of working with standard platforms and pre-certified software in pre-configured bundles is that installation of the equipment usually goes a lot smoother than when outfitting traditional baseband video facilities.

HP has a complete suite of services to help with any implementation project, from start to finish. They'll even run the facility for you. The company's high-availability hosting solutions keep media companies focused on their core business, not the technical challenges behind the scenes. HP digital rights management solutions help to address legal and regulatory concerns. And HP online content digital repository solutions support the massive volumes of interactive, user-generated content that can now easily grow with the business.

So, as broadcasters begin to think of themselves as "broadercasters," HP is ready with the technology, expertise and human resources to help every step of the way. File-based media workflows are the future of professional production and distribution, and with its converged infrastructure and strategic software media partners, HP is proving on every project it supports that the best strategy for a technology and services provider is to be inclusive, not proprietary.

For more information please visit: www.hp.com/media/entertainment

NAB REPLAY

Welcome to *Broadcast Engineering's* NAB Replay. Here we provide in-depth coverage of products and technology from the 2010 NAB Show, including:

Pick Hits *Broadcast Engineering's* Pick Hit Awards are the industry's longest-running product technology awards for broadcast and production. With a 26-year history, Pick Hits are the most prestigious technical awards given at NAB. Here are the top 20 products selected from the show by our panel of independent judges. 45

Technology Seminar New stereoscopic 3-D innovations made this one of the most interesting NAB conventions in history. Read on for 3-D highlights from the show floor. 52

Product Jackpot Here we've compiled more than 100 hot new products shown at this year's NAB. Want more product coverage? Check out the *NAB Special Report* packaged with this issue, where you'll find more than 30 pages of additional products. 54

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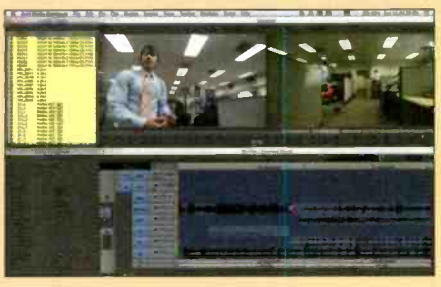

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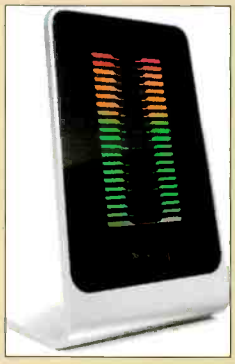

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SD/HD capture and playback solution for USB 3.0 computers; combines the speed of USB 3.0 running at 4.8Gb/s, providing enough speed for the highest quality uncompressed 10-bit HD video wit the maximum possible real-time effects; features dozens of audio and video connections built-in; includes audio level meters; built-in up-, down- and crossconverter lets users edit in one format and then output to any HD or SD format.

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www.dejero.com

Newsgathering system offers a new way to broadcast live high-quality video without the high cost or complexity of satellite or microwave transmission; with the system, one cameraperson and the Dejero LIVE Mobile Transmitter can transmit from any location in cell-phone range; using patent-pending technology, the platform improves live interview talkback, transmitting with only one-second latency.

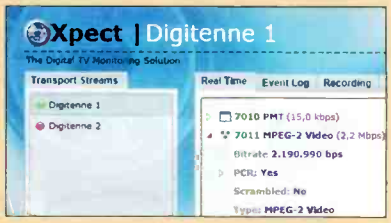
Professional camcorder employs an MPEG-2 4:2:2 50Mb/s codec — Canon XF Codec — for capturing and recording native 1920 x 1080 video onto affordable, universally available compact flash cards; unites video, audio and metadata into a single file; uses an MXF file wrapper to maximize compatibility with existing industry infrastructure and nonlinear editing systems; includes a Canon 18x HD L-series lens to provide news camera operators with the focal-range versatility required in the field; features industry-standard HD-SDI output, genlock and SMPTE time code (in/out) terminals for multicamera or 3-D productions.

XF305

Canon
201-807-3300
www.usa.canon.com

DTC-720 Xpect

DekTec Digital Video
+31 35 6469210
www.dektec.com



24/7 transport stream monitoring software package continuously checks transport stream for compliance to TR 101 290 and compares each stream to a user-created template (defining the expected properties of the transport stream); any violations of the TR 101 290 rules or mismatches to the template are logged in a database and can be signalled to an NMS through SNMP traps or as an IP/UDS-based message; keeps logs of statistical information (such as bit rates, number of CC errors and scrambled status), tables and individual components in the monitored stream; monitors multiple transport streams simultaneously, applying different test criteria to each stream.

Nevion has your video transport solutions

Upgrading your video broadcast infrastructure to HD, 3G or IP? Nevion, formerly Network/VPG, has what you need. With our modular, state-of-the-art technology, it's surprisingly easy to make the transition from SD to 3G optical capability. Connect easily to external contribution networks with the same solution adapting to IP, SDH, or fiber overlay.

- Upgrade your facilities to optical 3G
- Award winning, lightweight and rugged FlashCase outside-broadcast platform
- JPEG 2000 compression with scalable quality for SD and HD
- Intelligent perfect switch guarantees signal quality and no service disruption
- Standards-based modules ensure seamless interoperability

nevion

where video is moving

+47 33 48 99 99

nevion.com
sales@nevion.com

BrightEye 57
Ensemble Designs
530-478-1830
www.ensembledesigns.com

Genlockable sync generator and test signal generator can be used as either a slave or master reference generator; can lock to house reference or to its own internal precision standard; suited for remote trucks, post, helicopters and flypacks; 1.5Gb/s HD, 3Gb/s HD or SD SDI test signals or black with embedded audio is output on the SDI BNCs; 3G Level A and Level B are supported; composite, HD tri-level sync and AES digital audio outputs also are provided; three user-programmable outputs are selectable between AES, LTC, Word-clock or 6Hz Pulse; analog audio and AES outputs provide tone or silence.

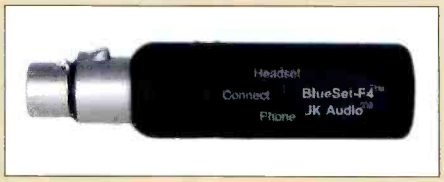
OP+TDMT/R+8
Harris
800-231-9673
www.broadcast.harris.com

Fiber-optic products can transport up to four 3Gb/s, eight HD-SDI or eight SD/ASI signals, or any combination equal to 12Gb/s of transport signals, over a single optical fiber; allow for up to 24 independent 3Gb/s or 48 independent HD/SD/ASI signals in a single 2RU frame; TDM, CWDM and DWDM are implemented in the line; using CWDM or DWDM, several signals can be combined into single wavelengths to provide a cost-effective and expandable design.

LTR-100HS
FOR-A
201-944-1120
www.for-a.com

Video archive recorder supports LTO-5 technology, the latest standard in long-term, high-capacity tape storage; makes file ingest workflow more efficient; reduces archive space requirements; equipped with an MPEG-2 codec, the LTR-100HS includes an MXF wrapper/unwrapper, so MXF files (XDCAM HD/HD422/IMX) recorded to LTO-5 tape can be used directly by many NLE systems.

BlueSet
JK Audio
815-786-2929
www.jkaudio.com



Series of intercom headset adapters uses Bluetooth wireless technology; headset interfaces plug directly into most party-line beltpacks, replacing wired headsets; a 3.5mm stereo headset jack contains a mic level output signal suitable for recording, with the beltpack headphone signal on the left channel and the Bluetooth return signal on the right; a switch selects between connection to a third-party Bluetooth headset or a cell phone.

Ignite Konnect
Grass Valley
503-526-8100
www.grassvalley.com

Provides automation control of the Grass Valley Kalypso and Kayenne video production switchers; designed to provide an easy, flexible transition to live production automation; for live production automation applications where a user already has a Kalypso or Kayenne switcher in place; allows users to automate as much or as little of their workflow as they need; requires little or no change to existing switcher effects.

Kahuna 360
Snell
818-556-2616
www.snellgroup.com

Production switcher platform supports 16 simultaneous broadcast productions in single mainframe; engineered for the most demanding production requirements; employs live assist and workflow tools to streamline operations; features Snell's Format Fusion³ technology, which supports any combination of SD, HD and 3G/1080p inputs and outputs, and seamlessly converts them to and from the required standards; designed to handle 3-D content with ease.

Take YouTube™ to Air

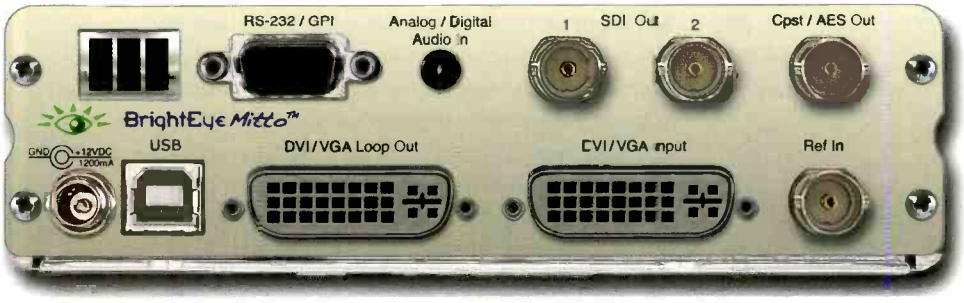
BrightEye Mitto™
Scan Converter For Broadcasters

PICK HIT
BroadcastEngineering
2009

Do You Need to Broadcast Video Content from the Web?
BrightEye Mitto offers the best way to take computer video to air. Video that once seemed constrained by your computer desktop can now be used for the most demanding broadcast and display applications. Just use a mouse to select the video you want to output to air.

Superior Quality – For the Most Demanding Broadcast Applications
BrightEye Mitto* has the advantage of proprietary scaling technology and exclusive multi-tap filtering. The filters automatically adjust in accordance with the conversion being performed. The result is that the output looks as good, or better, than the original and passes the most stringent testing.

A broadcaster came to us and asked that we build an HD scan converter for them. When we brought the prototype to them for testing, they were ecstatic at how good the output looked.



Easy-to-Use
Simply use your mouse to click and drag over the specific portion of computer video that you want to output. Whether you output the entire screen or just a selected portion, you'll be able to see exactly what you are doing. And timing the video output into your system is easy, too.

Purveyors of Fine Video Gear – Loved By Engineers Worldwide

* *Mitto* - the Latin root word for *Transmit* and *Uncompromising*

ENSEMBLE
DESIGNS
www.ensembledesigns.com
530.478.1830

Automatic Loudness Control

Miranda
514-333-1772
www.miranda.com

Automatic Loudness Control (ALC) solution prevents excessive jumps in program-to-program and channel-to-channel loudness levels; available for multiple Densité interfaces; designed to address all typical loudness problems including audio level changes between programs and commercials, without adversely impacting program content; three ALC solutions are available: ALC with Linear Acoustic AEROMAX processing, ALC with Jünger Audio Level Magic processing, and ALC with Miranda's low-cost, high-performance wideband audio processing.

3-D TECHNOLOGY

Neo3D

CineForm
858-345-2645
www.cineform.com

Delivers a real-time 3-D editing workflow compatible with Premiere Pro, After Effects, Final Cut Pro, Media Composer, Vegas and other editorial and effects tools in a manner similar to editing any CineForm 2D file; at the heart of the system is First Light 3D; all 2D and 3-D adjustments are implemented as active metadata under control of First Light; features display support for most 3-D monitors, keyframable 3-D adjustments (all real-time), individual eye adjustments for color and image flip, and keystoning adjustment.

AG-3DA1

Panasonic
201-392-6141
www.panasonic.com/broadcast

Fully integrated HD 3-D solid-state camcorder is equipped with dual lenses and two full 1920 x 1080 2.07 megapixel 3MOS imagers to record 1080/60i, 50i, 30p, 25p and 24p (native) and 720/60p and 50p in AVCHD; can record for up to 108 minutes on dual 32GB SD cards in AVCHD PH mode; offers professional interfaces, including dual HD-SDI out, HDMI (version 1.4), two XLR connectors, built-in stereo microphone and twin-lens camera remotes; weighs less than 6.6lbs.

GD-463D10

JVC
973-317-5000
www.jvc.com/pro

3-D LCD monitor features a large 46in screen and cabinet depth of 1.5in; compatible with line-by-line and side-by-side 3-D input methods, both of which are used for 3-D content production; employs the Xpol circular polarizing method to ensure natural 3-D reproduction; equipped with three HDMI terminals compatible with 3-D input signals; 3-D images can be viewed by wearing a pair of lightweight circular polarizing glasses that do not require a power source; conventional 2-D images also can be viewed without special equipment.

Dimension-3D

Doremi Labs
818-562-1101
www.doremilabs.com

3-D format converter allows the conversion of any standard 3-D format to another, including changing of the frame rate; standard video formats are supported from high definition to 2K; accepts both dual- and single-stream, as well as HDMI inputs and outputs; enables double-stack 3-D projection; by encoding the left and right eye streams into a single HD-SDI stream and back again, the unit becomes ideal for recording 3-D content on standard HD tape and server technologies.

TDM-150W

TV Logic
818-567-4900
www.tvlogicusa.com

3-D OLED monitor is designed for stereoscopic cinema and broadcast production monitoring; uses a 15in (16:9) 120Hz Active Matrix Organic Light Emitting Diode Display at native 1366 x 768 resolution combined with active shutter glasses for vivid 3-D video experience; provides full HD/SDI input and output support, including 3G and dual-link.

Extend. Distribute. Innovate.

Unparalled resolution with secure and reliable media distribution over fiber. Access the equipment you need to get the job done - whether you are in the editing suite, machine room, broadcast studio, or traffic center.

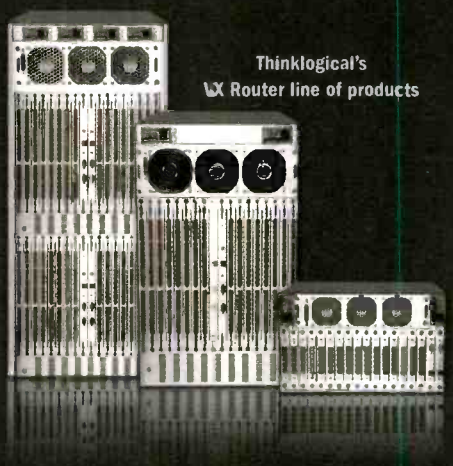
VX 160 Router

Route and switch virtually any desktop device up to 40 kilometers away from the controlling computer.

Transport every frame of a video stream with unprecedented bandwidth - **6.25 Gbps** - with NO compression or frame dropping.

Whether your infrastructure requirements are three floors apart or three blocks apart, Thinklogical provides innovative media distribution.

Find out more about our VelocityKVM extension line and our series of VX Routers at **www.thinklogical.com** or **800-291-3211.**



Thinklogical's VX Router line of products

thinklogical™

Inspired technology for the broadcast and post production industry

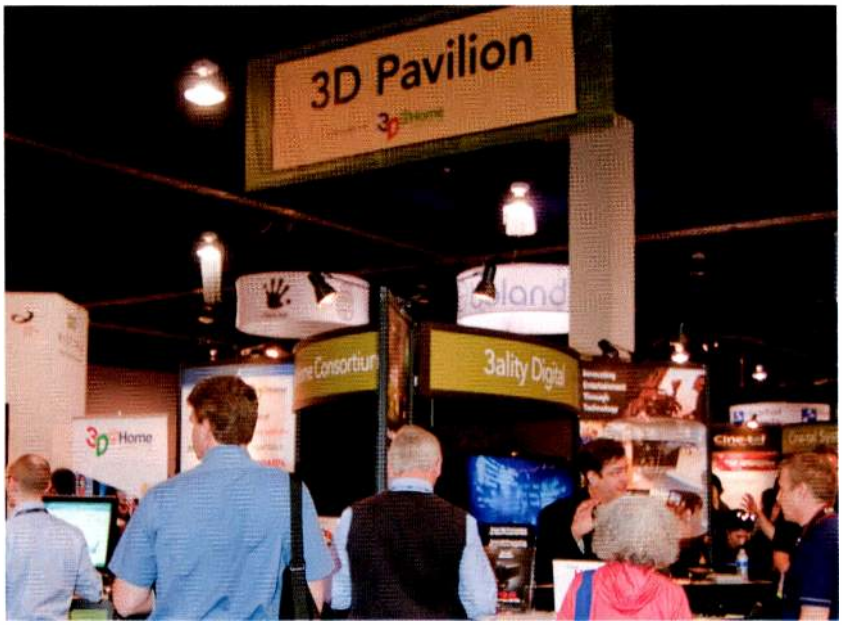
3-D highlights

3-D was arguably the biggest buzz at the NAB Show.

BY L.T. MARTIN

This year, the broadcast industry aimed to make stereoscopic 3-D a mainstream medium for home-delivered entertainment, in hopes that it would become as successful an introduction as high definition. But if you read my blog from the floor of the Las Vegas Convention Center (*blog.broadcastengineering.com/3-D*), you know I maintain a healthy skepticism over whether stereoscopic 3-D will ever rise above being a tantalizing, but limited, event experience. There's a big difference between paying a premium ticket price to see stereo 3-D in a theater and trying to watch it on a daily basis in the living room.

However, it is always exciting to feel the electricity in the air when new ideas rise up to challenge the existing broadcasting landscape, and new stereoscopic 3-D innovations made this one of the most interesting NAB conventions ever. (For simplicity, I'm going to drop the "stereoscopic" modifier from now on since single-stream, or "anaglyph," 3-D has rightly become a poor stepchild in the minds of NAB exhibitors enthusiastic over the possibilities of home-delivered 3-D entertainment.)



This year's NAB trade show featured a 3-D Pavilion, where companies showed off the newest 3-D technologies for software, editing, display, video production and more.

3-D industry announcements

There have been interesting experiments in over-the-air 3-D broadcasting in Japan, Holland, Korea and the UK using various formats, and just before the 2010 NAB Show, a slew of announcements were made regarding 3-D delivery to U. S. homes. ESPN will start 3-D broadcasting with the World Cup games this month, Mark Cuban declared that most of the prime time and weekend shows for his HDNet will be shot in 3-D, Next3D is gearing up for 3-D VOD channels in conjunction with Turner Broadcasting, and the Discovery Channel revealed a joint venture with Sony and IMAX to launch a 24/7 3-D network later this year. Even during the NAB 2010 Show itself, Comcast presented select coverage of the Masters Golf Tournament in 3-D, seen at several exhibits.

While roaming the halls of the convention center, concerns over the public's acceptance of this new medium started to arise. First, only JVC and Hyundai have plans to market home 3-D TVs that can be seen using cheap, passive polarized glasses — the kind you get in most movie theaters. All of the rest — including Panasonic, Samsung, Sony, Mitsubishi and Vizio — will require active shutter glasses to see Z-space on their home screens because those displays are less expensive to manufacture. However, those "flicker" glasses are costly, easily breakable, require charged batteries and, most significantly, are in large part incompatible with competing brands.

But these concerns don't show up in public opinion surveys about the desire for home 3-D. After all, Blu-ray has released its specs for 3-D discs and expects robust sales. In fact, Futuresource Consulting, a market research firm, has predicted that 70 percent of U. S. households will have a 3-D-ready home display by 2015. The question is whether viewers will use them enough to support around-the-clock 3-D entertainment delivery, or if these pricey sets will be switched to their 3-D modes only for special occasions.

3-D technology at NAB

At the NAB Show, many companies created a buzz over their new 3-D gear. Crowds gathered at the Panasonic booth to see its AG-3DA1 single-body 3-D camera fitted with twin lenses and two 1920 x 1080 2.07-megapixel 3MOS imagers that can record up to 180 minutes on dual 32GB SD cards in AVCHD PH mode.

Panasonic also showed depth-enhanced images on its new 25.5in BT-3Dl2550 3-D monitor, which can be connected directly to the AG-3DA1 and other 3-D cameras via HD-SDI inputs. The BT-3Dl2550 is designed as a production monitor, so it uses Xpol polarizing that enables engineers to view it with passive 3-D glasses.

That phenomenon was also on display in Sony's 3-D technology installed in the 53ft double Expando 3-D-enabled HD production truck built by All Movie Video. The remote vehicle was equipped with an MVS-8000G multiformat switcher that can combine two camera inputs into a single 3-D source. All of the screens at the engineering stations used polarized displays so the engineers could watch multiple screens in sync with each other.

One of the most impressive 3-D displays was TVLogic's TDM-150W. It's one of the first 3-D organic light-emitting diode (OLED) monitors, boasting a 100,000:1 contrast ratio. The display is only 15in in size, and due to limited production runs, it will be relegated to broadcast production use for the time being.

Grass Valley disavowed the need for 3-D-specific equipment, claiming all its existing gear is 3-D ready today. The company underlined this with a 3-D camera demo by linking two LDK 8000 cameras side-by-side, introduced the latest version of its K2 Dyno replay system with the ability to handle super slo-mo and 3-D projects, and detailed a 3-D workflow through a Kayenne video production center.

For 3-D format conversion, Miranda showed off its Densité 3DX-3901 signal processor capable of converting multiple 3-D formats, and brought out a new 3-D option for its Imagestore 750 channel-branding processor capable of providing up to four 3-D keying layers and offering a variable "Z-plane" for graphics depth control. To see those signals, Miranda had its Kaleido-X16, a 16-input, dual output multiviewer for 3Gb/s/HD/SD/analog 3-D monitoring.

Post production remains the budget sinkhole for anything but live 3-D production, and few NLE manufacturers have addressed it directly. Avid offers dual timeline mainstream 3-D editing with direct output to full 3-D displays.

Adobe Systems unveiled its Creative Suite 5 product family. However, its editing component, Premiere Pro, can handle 3-D projects only with the help of CineForm plug-ins, despite the boost it gets from the remarkable new GPU-accelerated Adobe Mercury Playback Engine.

Autodesk gave 2011 labels to its NAB 2010 releases of Flame, Flare, Flint, Smoke and Lustre and claimed many had enhanced 3-D capabilities even though that usually referred to 3D graphics, character animation or compositing.

Quantel trumpeted its 3-D post-production products, although unless you have the budget of "Avatar," it's hard to afford them. There is little that you can't do in 3-D with the company's new version 5 software for eQ, iQ and Pablo systems.

Conclusion

Even this skeptic recognizes there is gold in them there 3-D hills: gold for special events, gold for theatrical blockbusters, and by all means gold for home video game players who can vegetate for hours under those 3-D glasses. With all the ballyhoo at NAB 2010 over home-delivered 3-D entertainment, time will tell if it can become a mainstream medium capable of being popular enough to support 24/7 delivery channels. BE

L.T. Martin is a freelance writer and post-production consultant.

For more Technology Seminar coverage from NAB, go to *www.broadcastengineering.com*

AUTOMATION AND PLAYOUT PLATFORM
OmniBus iTX

Includes more than 130 new features, including advanced aspect ratio control with AFD insertion, BXF schedule import, enhanced CG capability and closed-captioning functionality, support for copy guard data insertion, additional bit rate support for Dolby D, and schedule preview control; allows broadcasters to mix both media formats and resolutions in the same schedule; broadcast HD, SD and lower bit rates can be mixed within a single schedule and are automatically up- or downconverted by iTX; can be used for Internet TV and streaming delivery applications.

303-237-4868; www.omnibus.tv

FILE-BASED WORKFLOW
RadiantGrid StationReady

Platform includes transcoding, transformation templates, archive and resource management, CC and ancillary data management, and BXF integration module; also features optional loudness control, transwrapping and upmixing support.

877-828-0094; www.radiantgrid.com

FIBER-OPTIC TRANSCEIVER
Telecast Fiber Systems CopperHead 3200

Provides a robust fiber-optic link between any professional camera or camcorder and the broadcaster's truck, control room or broadcasting center position; over a single fiber connection, transports bidirectional digital (SDI or HD/SDI) and analog (NTSC or PAL) video as well as all two-way camera control, audio, video, data, sync, tally/call, prompter and intercom signals between the camera and base station; features a 10/100 Ethernet path; camera unit mounts directly to any professional camera's battery interface system; base station provides plug-and-play operation without any front-panel adjustments in a lightweight, 1RU frame.

508-754-4858
www.telecast-fiber.com

CONTENT MANAGEMENT
Signiant content management system

Allows organizations to exchange content quickly, securely and cost-effectively; key components include content transporter, content point and content transfer engine; collectively supports five to 15 nodes of internal and external sites, creating a managed network with automated movement; provides single-node management.

781-221-4000; www.signiant.com

FIBER-OPTIC TRANSPORT
MultiDyne HD-4400-CWDM

High-density, multirate, 3G HD-SDI SMPTE FO transport system with a 4x4 matrix on both the transmitter and receiver; transports four 3G, HD-SDI signals over one fiber; openGear-compatible.

888-332-6779; www.multidyne.com

REFERENCE RECORDER
360 Systems MAXX-2020HD

Provides lossless recording and playback of many HD video formats, including paired channels for 3-D; accepts images in any color space with 8, 10 or 12 bits; doesn't compress the image; includes two channels, which can be used for independent HD-SDI streams, as a 3-D pair or as a single 3G channel; two recorders can be synchronized for dual-3G operation; SAS drive enclosures attach with a single cable; features HDMI monitor outputs, 16 channels of 24-bit audio, slow motion, nine-pin control, LTC time code, file trimming and playlisting.

818-735-8221; www.360systems.com

LOUDNESS MONITOR
Wohler Pandora

Desktop or rack-mountable loudness monitor and measurement (LKFS) of any SDI video signal with audio; handles AES, PCM, Dolby, stereo or multichannel audio; graphic display shows changes in loudness over time and real-time loudness (LU) levels at a glance; offers user-adjustable loudness measurement parameters, including reference level, gating and integration time; handles two-, four-, six- or eight-channel (AES or SDI) operation.

510-870-0810; www.wohler.com

INTERCOM VIRTUAL KEY SOFTWARE
Riedel Artist VCP-1004 Virtual Panel

Allows a regular computer to be used as an intercom control panel in combination with any Artist digital matrix intercom system; computers running the software can be integrated via a wired or a wireless Ethernet connection into the matrix; the communication between matrix and virtual panel is realized via the VoIP-108 G2 client card; features four talk-keys and a shift-key to double the number of available keys.

914-819-0495; www.riedel.net

DIGITAL MIXING CONSOLE
Yamaha Commercial Audio Systems M7CL V3

Includes an updated control interface, in-depth access management facilities and a range of built-in functions for medium-sized live sound applications; new features include sends on fader functionality for remote, console-independent sends on fader operation, as well as additional input patch, output patch, direct out patch and insert out patch recall safe parameters for setup flexibility and control.

714-522-9011; www.yamahaca.com

MEDIA ASSET MANAGEMENT
Dalet Enterprise Edition

Customizable platform enables broadcasters and content producers to integrate multiple workflows and formats — news, sports, programs, VOD, archives in SD and HD — under one fluid system; built-in production tools manage ingest, logging, production, distribution and archiving across systems and workgroups.

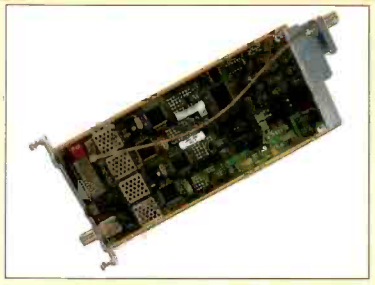
212-269-6700; www.dalet.com

CONVERTER
AJA FiDO

Family of SDI/optical fiber converters for the transport of SDI, HD-SDI and 3G SDI over distances of up to 10km; designed for outdoor or indoor use; converters pass the complete SDI signal (including audio and/or meta data); meets all relevant SMPTE specifications; low profile enclosure enables use in tight spaces.

800-251-4224; www.aja.com

8VSB TO DVB-ASI CONVERTER
Nevion VS198



Allows carriers to take off-air video into their cable or IPTV distribution networks and directly service end users; simultaneously receives up to four off-air 8VSB ATSC RF channels and maps them directly to DVB-ASI electrical outputs using a single antenna source; can be used to aggregate off-air transmissions onto any ASI network, including IP, fiber and SONET/SDH.

805-247-8560; www.nevion.com

FIBER-OPTIC DISTRIBUTION PANEL
Gepco HMS

Provides on-site termination solution for SMPTE 304M format camera connectors; features an internal cable management design with configurable ports for multiple cable formats, including 9.2mm SMPTE hybrid cable and discrete electrical and fiber cables.

847-795-9555; www.gepco.com

ROBOTIC PEDESTAL
Vinten Radamec Fusion FP-188VR

Can be used in both fully robotic and manual modes; in automated studio operation, it allows precise positioning anywhere on the studio floor without the need for complex set-ups or visible market systems; in manual mode, it tracks and uses the same location system to stream precise positional data to a virtual graphics system; has a payload capacity of 180lbs.

845-268-0100
www.vintenradamec.com

TRI-AMPLIFIED MONITORING SYSTEM
Genelec 1038CF

Features loudspeaker drivers, slim speaker enclosure, dual 8in-long throw bass drivers and multiple power amplifiers, as well as active, low-level crossovers; designed for medium-size control rooms; uses Genelec's advanced Directivity Controlled Waveguide technology, which is designed to provide excellent stereo imaging and frequency balance — even in difficult acoustic environments.

508-652-0900; www.genelecusa.com

3-D TV SET-TOP BOXES FOR CABLE
Motorola DCX

Software enhancements enable 3-D content to be processed in the set-top boxes before delivery to 3-D-capable TVs in the home; this enables consumers to seamlessly switch between 2-D and 3-D channels; support 3-D TV over MPEG-4 and MPEG-2; capable of 1080p24/30 output; new software supports all on-screen displays, such as closed-captioning, emergency alerts, and application graphics and text overlays.

215-323-2194; www.motorola.com

DISTRIBUTION AMPLIFIER
ESE DV-212

1 x 12 3G/HD/SD-SDI distribution amplifier provides cable equalization, reclocking and distribution; distributes one 3G, HD or SD-SDI input signal to 12 outputs; video signal can be reclocked before distribution or distributed without retiming the input signal; in reclocking mode, the unit automatically detects and reclocks the 270Mb/s, 1.5Gb/s or 3Gb/s signal.

310-322-2136; www.ese-web.com

INGEST SYSTEM
AmberFin iCR Smart Ingest

Combines high-quality HD/SD ingest with automatic assisted QC in a single system; allows tape content to be efficiently and reliably used in workflows based on central storage solutions, including SAN- and NAS-based architectures; performs a wide range of automatic quality tests on video, audio and time code; provides easy-to-read reports that detail the nature and position of an error with a thumbnail of the frame where it occurred.

818-768-8948; www.amberfin.com

WORKFLOW ENGINE
Harmonic Rhozet Workflow System

Task-based workflow engine for automated management of the video asset transformation process improves scalability, efficiency and reliability for media companies' transcoding needs with an open, distributed workflow; manages large-scale networks of Carbon Coder transcoder nodes in a distributed farm configuration; allows for automated processing of high-volume transcoding tasks, failover support, job distribution, prioritization and notification, dynamic load balancing, file transfer and status monitoring.

408-542-2500
www.harmonicinc.com

CONVERTER
Ensemble Designs BrightEye 72

Allows broadcasters to use off-the-shelf monitors for high-end broadcast applications; converts a 3Gb/s, HD or SD-SDI video signal into an HDMI signal that can drive most consumer monitors; converter provides color correction and caption decoding; features supplemental onscreen signal display of time code burn-in and AFD, up to 16 channels of onscreen audio metering, and built-in color corrector for studio applications where onset monitors are used and need to be color balanced for studio lighting.

530-478-1830
www.ensembledesigns.com

3D GRAPHICS AND ANIMATION SYSTEM
Vizrt Viz Trio One-Box

Latest version of the Viz Trio real-time 3D graphics and animation system; instead of requiring a PC as well as an additional rendering engine, Viz Trio One-Box combines the Viz Trio client and Viz Engine on a single PC with two internal graphics cards; both the VGA preview and final program signals can be viewed on one PC with no negative impact on graphics quality or rendering speed.

212-560-0708; www.vizrt.com

VIDEO SWITCHER
Barco FSN Series

3Gb/s multiformat video switcher features a new Universal Output Card (UOC), built-in 16-channel multiviewer with full UMD, a two-channel 2D DVE card and new software capable of controlling 2.5 M/Es; each dual-channel UOC allows any aux bus to output DVI, analog or SMPTE SDI signals at any format.

916-859-2500; www.barco.com

FIBER-OPTIC INTERFACE
Extron FOX 3G DVC

Receives fiber-optic SDI, HD-SDI and 3G-SDI signals over a single fiber and converts them to DVI-D and analog RGB or component video; compatible with the FOX HD-SDI Fiber Optic Extender, distribution amplifiers, switchers and matrix switchers; ideal for television production and applications that require long-distance transmission of SDI signals from broadcast-type sources, and interfacing them with professional/consumer-level displays and other products.

714-491-1500; www.extron.com

PRODUCTION SOFTWARE
Quantel V5

Applies to eQ, iQ and Pablo; delivers major advances in color correction, RED and stereo 3-D workflows; supports multilayer color correction, real-time color correction on Pablo, new stereo 3-D timeline and 3-D tools; features a new soft mount tool for RED r3D media.

212-944-6820; www.quantel.com

TELESCOPING JIB ARM
Telescopic TechnoJib

Ability to maneuver into inaccessible areas and to smoothly, silently and quickly move in and out of a shot; comes in 15ft and 24ft telescoping arms with single-operator control; equipped with a Mitchell Mount adapter; can easily accommodate most remote heads underslung or overslung.

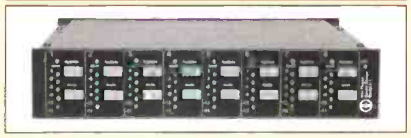
818-917-5677
www.telescopicjib.com

AUTOMATED AD INSERTION
Inlet Spinnaker

For live video streaming; provides support for second-generation adaptive streaming, including support for Apple iPad, Blackberry, Android and the other 3GPP devices; uses SCTE-35 signaling to automate the insertion of video-based ads into live video streams; regional ad insertion is also available.

919-856-1080; www.inlethd.com

AUTOMATIC MIC MIXER
Dugan E-1



Automatic mixing controller downloads a Java-driven remote control panel to the user's Web browser; provides eight channels of signal processing; patches into the input insert points of an audio mixing console; includes analog I/O plus two pairs of ADAT connectors — one pair for digital I/O and one pair for linking.

415-821-9776; www.dandugan.com

ETHERNET IP ROUTER
Utah Scientific 400iP

24-port GigE workgroup router provides real-time control of port priority, security groups and port speed on Ethernet networks; can dramatically increase workflow and efficiency in applications where large video files or high bitrate streaming video are transferred over Ethernet; permits operators to instantly change parameters, including allocated bandwidth, QoS and VLAN assignments.

801-575-3770
www.utahscientific.com

AUDIO CONSOLE
Salzbrenner Stagetec AURATUS virtual control panel

New virtual control panel software simulates additional control panels for the console, which are not physically built in; the GUI software runs on any standard PC linked via Ethernet to the new TREM controller unit mounted in the console's frame; once set up and running, the GUI simulates all the control elements so operators have full access to every control that is found on the hardware console's control surface normally — including all metering, faders and encoders.

888-782-4391; www.stagetec.com

3-D LCD MONITOR
Marshall Electronics 3D-241-HDSDI

New 24in, 1920 x 1200 monitor uses advanced engineering to deliver a natural, flicker-free 3-D image using a circular polarizing filter method, which employs a 3-D optical filter applied to the surface of a flat-panel display; includes four HD-SDI input, which enables the monitoring of two 3-D (left eye, right eye) HD-SDI signals; supports IMD functions through RS-422/485 connections.

310-333-0688; www.lcdracks.com

ENERGY MANAGEMENT SYSTEM
TSL MDU12-PMi

Provides users with total control over and visibility of equipment racks, no matter how geographically spread their locations; features remotely switchable outputs; designed to play a central role in system management and conservation of energy in major new broadcast installations.

+44 1628 676 200; www.tsl.co.uk

VOD APPLICATION
Strategy & Technology S&T Player

Designed for MHEG-enabled integrated digital TVs or set-top boxes; allows viewers to navigate a broadcaster's VOD catalog and select individual titles for viewing using the remote control; video is delivered via DVB-C or IP; once playback has started, the player offers viewers full playback control; dynamic playlist support enables additional revenues to operators through ad insertion, while comprehensive playback reporting provides important measurement data and reporting for the operator.

303-926-4933; www.s-and-t.com

MODULAR I/O BOX
Calrec Audio Artemis

Fully customizable 3U I/O interface box fits into the Hydra2 network system; designed to meet the rigors of live production, whether in an OB truck or on a studio floor; contributes to fast and easy signal routing among devices on an audio network; its mix of audio interfaces and high-density connections support cost-effectiveness while at the same time reducing size.

+44 1422 842159; www.calrec.com

LIP SYNC CORRECTION
Miranda iControl

iControl lip-sync monitor option allows lip-sync error detection and measurement to be performed across broad signal distribution networks; unique signal fingerprint comparison technology allows detection of conditions where the synchronization between audio and video has been severed; can collect fingerprint data over IP networks and perform detection of lip-sync errors of up to several seconds; provides reports and graphs to help operators better understand the operation of complex signal distribution networks.

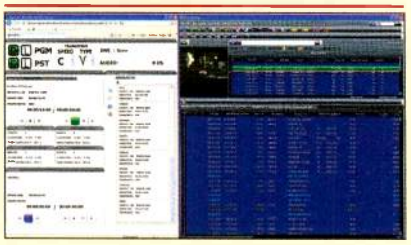
973-379-0089; www.miranda.com

AUTOMATION
Snell Morpheus

Morpheus version 2 capable of running in a virtual machine environment; enhanced join-in-progress feature; new configuration tool for Media Ball allows multiple hierarchically-linked events to be grouped together and managed as a single entity.

818-556-2616
www.snellgroup.com

STATION-IN-A-BOX
Florical Acuitas



Eliminates the traditional, serial-based, proprietary boxes within the broadcast chain by using all off-the-shelf, IT-based components to provide reliable and affordable HD playout, graphics, effects and switching; powered by Florical's AirBoss; provides a feature-rich, flexible and reliable IT-based playout system; creates a service-oriented architecture; can be used for simple commercial insertion operation or to run multichannels.

352-372-8326; www.florical.com

PRODUCTION AUTOMATION
Azzurro AzzurroCam

Fully-integrated, compact production system and high-quality HD video transmission solution is ideal for sports arenas or any facility requiring a robotically-controlled single or multiple pan/tilt and zoom camera application.

201-767-0850; www.azzurrosi.com

PRODUCTION SWITCHER CONTROL PANELS
Ross Video Vision Series

Control panels are modular; now have the ability to add extra MLE and crosspoint control into open module slots on the control surface, thus adding control for additional MLEs; dedicated simultaneous control of up to five MLEs is possible in the largest Vision Series control panel.

613-652-4886; www.rossvideo.com

ADVANCED SOFT PANELS
Pixel Power Management Console

Supports the creation of custom soft panels for BrandMaster; includes a built-in layout editor supporting drag-and-drop simplicity to the process of laying out or modifying a panel design; enables unconstrained panel designs to suit any requirement; provides novel control possibilities such as the use of touch screens, including multitouch and gestures, to add flexibility in master control environments.

818-276-4515; www.pixelpower.com

COLOR CORRECTOR

Blackmagic Design DaVinci Resolve 7.0

Features include support for Mac OS X platform, upgraded user interface, improved video field support, a new EDL library and improved shared database support; three models of DaVinci Resolve areavailable: a Mac-based software-only version, a Mac-based version that includes the DaVinci Resolve control surface, and a high-end Linux version that supports multiple GPU supercomputer based systems.

408-954-0500
www.blackmagic-design.com

PORTABLE HD ZOOM LENS

Canon KT17ex4.3B

Designed to support both HD ENG and general HD production requirements; 1/3in lens is ideal for shooting assignments that require flexible creative control and a generous focal range; features a 17X zoom ratio and minimum focal length of 4.3mm, which provides a 62.6-degree angular field of view in the 16:9 HDTV image format; its built-in 2X extender increases the focal-length range from 8.6mm to 146mm.

800-321-4388
www.canonbroadcast.com

3G/HD/SD CABLE EQUALIZERS

Gennum GS2993/GS2994

Features include a wider output DC coupling range, optional intelligent power down/power up to allow the chip to enter power-savings mode when not in use and output de-emphasis to drive longer traces between chips; offer full-swing (800mV) and half-swing (400mV) options to provide equipment designers with a flexible, lower-power solution; GS2993 integrates independent dual outputs to drive two devices with different input requirements and trace lengths and includes a cable length indicator.

905-632-2999; www.gennum.com

3G FIBER TRANSMITTER

Lynx Technik OTX 1840

Supports all SDI video standards, including 3G 1080p for transmission up to 24.8mi at a wavelength of 1550nm; includes an SDI input and fiber output for single-mode transmission of video signals; when paired with the fiber-optic-to-SDI receiver (Yellobrik ORX 1800), the resulting solution is an optical transmission/receiver system.

661-251-8600
www.lynx-technik.com

DVI SWITCHER

PESA PRO 8X8-DVI

1RU rack-mountable frame assembly with eight DVI-D input ports and eight DVI-D output ports; provides single-link, DVI-D operations up to 1920 x 1200@60Hz (WUXGA) resolutions plus 480p to 1080p video formats; control via local push button selector, IR remote, USB local interface or via an RS-232 connection; has an EDID learning function, reducing switching speed while maintaining bi-directional communications between the switcher frame and connected devices.

800-323-7372; www.pesa.com

CAMERA CARRIER

Petrol Bags Cambio

Carry-on size, smooth-rolling camera carrier transforms into a lightweight support system for small video camcorders weighing up to 9.9lbs; allows users to travel lighter, avoid waiting for baggage and set up quickly once they've arrived at their location; optional lightweight micro-fluid head allows for quick attachment and conventional pan-and-tilt movements.

845-268-0100; www.petrolbags.com

COAX/FIBER LINK
Telemetrics 55D-CAU

Affordable camera control system with increased operating distance; ideally suited for both permanently installed or mobile applications; eliminates the need for video equalizers, frame synchronizers, intercom adapters, microphone phantom power and remote power supplies; offers a convenient and cost-effective means of transmitting HD/SD SDI video from the camera to the base station.

201-848-9818
www.telemetricsinc.com

VIDEO SERVERS
EVS XT[2]+ and XS

Provide full native support of Panasonic AVC-Intra video coding; are fully compliant with both H264/MPEG-4 AVC standard and SMPTE specifications; provide full 10-bit HD resolution at ENG bit rates and intra-frame compression.

973-575-7811; www.evs.tv

MEDIA ARCHIVING SYSTEM
EditShare Ark 2.0

Fully integrated with EditShare's shared storage solutions; offers media file protection for broadcast and post; provides digital and tape-based options for creating backups and archives; enhancements include integration with Flow for complete backup, integration with Flow for complete restoration of files, new support for multidrive tape libraries and a new activation feature for Ark Disk.

617-782-0479; www.editshare.com

CONTROL INTERFACE
Pixel Power VSP

VSP for BrandMaster features TFT switches that can display full-color static images or moving video of graphic and video assets; switches can be configured with images that show the exact effect or associated move; features well-proven tactile feel switches for source selection; available in 19in width and 3RU form factor.

818-276-4515; www.pixelpower.com

REPLAY SYSTEM
Grass Valley K2 Dyno

Can handle super slow-motion and 3-D projects, instant replay with slow-motion and super slow-motion; transferred files are wrapped with MXF or MOV; offers built-in VGA multi-viewer and SDI video monitoring, as well as GigE connectivity.

503-526-8100; www.grassvalley.com

PSIP GENERATOR
Triveni Digital GuideBuilder

Provides mission-critical operational capabilities for both content providers and network operators by generating PSIP data; enables unified fixed and mobile DTV metadata management and generation capabilities in a single platform; includes the addition of ESG functionality to ensure up-to-date scheduling and tuning, managed through the operator's existing workflow components.

609-716-3500
www.trivenidigital.com

BROADBAND VIDEO CONTRIBUTION FOR IPHONE
Streambox Live

Enables iPhone users to upload high-quality video using the AT&T 3G network; allows broadcasters to enhance breaking news stories with ad hoc content supplied by a variety of contributors, including video journalists, stringers and citizen reporters; the Streambox Live encoder is made available at no cost; the encoder may be easily downloaded to the contributor's laptop or mobile phone to enable transmission of live video with minimal latency; at the back end, broadcasters subscribing to the service can manage, track, archive and view unlimited amounts of video uploads from contributors.

206-956-0544; www.streambox.com

LOUDNESS MONITOR
Linear Acoustic LQ-1000

Provides critical loudness information in a simple, colorful and easy-to interpret manner; shows LKFS current loudness, target loudness and current true peak level; has both large numbers and a dual bar graph display; color is used to display the loudness comfort zones — green, blue, yellow and red; provides VGA output for external displays.

717-735-3611
www.linearacoustic.com

MEDIA ASSET MANAGEMENT
Netia Manreo 2

Offers an open, scalable architecture along with all the tools needed to simplify the cataloging, indexing, accessing and distribution of media; designed to maximize productivity gains in asset management and the use of rich media, which in turn can be repurposed and published to platforms such as Web portals and mobile devices; supports all industry-standard formats, ingesting content, generating browse proxies, enriching media through speech-to-text functionality, and providing easy access to media; incorporates new Workflow Engine and Hypercast Warehouse set of archiving tools.

+33 467 590 807; www.netia.com

AUDIO CONSOLE GUI

Stagetec virtual control panel

Virtual control panel software for AURATUS broadcast console; provides additional software-based control panels; GUI-software runs on standard PC linked via Ethernet to the console's TREM controller; GUI simulates all the control elements, providing operators with full access to every control that is found on the hardware console's control surface.

888-782-4391; www.stagetec.com

CONVERTER/EXTENDER MODULE

PESA VidBlox

Accepts computer graphic input signal and converts it to one of several user-selected SMPTE output formats; input pixel formats up to 2560 x 1600@60Hz are scaled to produce a selectable SMPTE 292M-, 372M- or 424M-compliant video output source on one or two BNC connectors, or a duplex SFP fiber module supporting either multimode or single-mode cabling; output formats include 1080p, 1080i or 720p and can be adjusted for standard 4:3 or widescreen 16:9 displays using AFD.

800-323-7372
www.pesa.com/vidblox

DIRECT ATTACHED SHARED STORAGE

Small Tree GraniteSTOR ST-RAID XL

Ethernet-based direct attached storage is scalable up to 64 drives and 128TB; provides real-time, multiclip editing for Final Cut users while supporting 36 streams of ProRes 422HQ concurrently with no dropped frames; easy to install and manage; enables instant availability and background initialization along with automatic insertion/removal detection and rebuild.

866-782-4622; www.small-tree.com

RECEIVER/DECODER

Sencore IRD 3000 series

Receiver/decoder line fits easily into existing SD infrastructure; cost-effective, field-upgradable upgrade path to HD; features satellite RF, MPEG over IP and ASI transport stream inputs; outputs include digital SDI or analog composite video; decodes both MPEG-4/H.264 and MPEG-2; compliant with DVB and ATSC standards.

800-736-2673; www.sencore.com

DIGITAL AUDIO MIXING SYSTEM

Euphonix Max Air

Designed for on-air and live-to-tape broadcast production applications; features include a modular surface design, touch screen with high-res metering, up to 48 multiformat fader strips, four knobs per channel, master module with SuperChannel and eight assignable faders, layouts for recalling assignments, N-1 mix-minus system, and 100-percent redundant DSP SuperCore.

818-766-1666; www.euphonix.com

STREAMING ENCODER

ViewCast Niagara GoStream SURF

Features simple A,B,C button selection of encoder profiles; features a streamlined chassis with intuitive front-panel controls and EASE control menu; simultaneously streams multiple resolutions at multiple data rates in multiple streaming formats, including MPEG-4 , Adobe Flash H.264 and Windows Media (Silverlight compatible); captures, encodes, streams and archives digital video and audio in full resolution.

800-540-4119; www.viewcast.com

MOBILE BROADBAND VIDEO WORKFLOW SOFTWARE
Telestream Vantage

Combines media capture, transcoding, clip management, analysis, QC and metadata processing into one unified workflow design and automation framework; integrates with all the major broadcast servers, edit systems, streaming servers, cable VOD servers, SANs and virtually any network digital device in your facility; allows users to design and automate video workflows; the modular nature allows enterprises to simplify the migration to IT workflows, improve video operations and more easily address new multiplatform business opportunities and revenue streams.

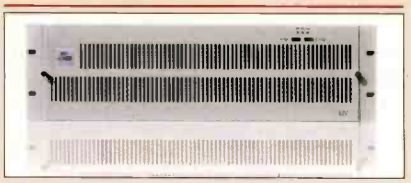
530-470-1331; www.telestream.net

BROADCAST MONITOR
Plura PBM-S

1.485Gb/s/270Mb/s-dual-input HD broadcast monitor provides a Grade A LCD panel; supports digital video formats, including HD and SD-SDI and analog video formats like RGB, component and composite; includes waveform/vectorscope, VPID, IMD and audio metering scales with digital audio decoding; supports underscan/zeroscan/overscan/zoom, 1:1 pixel mode and PIP and PAP; available in 17in to 46in sizes.

602-944-1044
www.plurabroadcast.com

MULTIVIEWER
Snell MV–Series



Flexible and cost-effective monitoring solution; up to 64 analog and digital video inputs, including 1080p; can display inputs of differing frame rates simultaneously; optional input cards for fiber connectivity for 270Mb/s, 1.5Gb/s and 3Gb/s SDI/HD-SDI; meters up to 16 channels of audio.

818-556-2626
www.snellgroup.com

MULTI-IMAGE DISPLAY AND MONITOR
Evertz MViP

Targeted at applications where simple and efficient monitoring of audio and video from an IP transport stream is required; supports both Unicast and Multicast network topologies; supports all major video compression standards: MPEG 2, H.264 / MPEG 4 AVC, MPEG 4 Part 2, VC1; supports all major audio compression standards: MPEG1L2, AC3, AAC; has alarms for loss of video, black, freeze and macro block detection.

905-335-3700; www.evertz.com

VIDEO SERVER
Harris NEXIO Volt

Integrated storage server with small form-factor; supports up to four mixed SD/HD or SD-only baseband channels in 1RU package; provides 1TB of RAID-3 protected internal media storage; comes standard with the NEXIO Playlist and NEXIO Remote application for ingest, playout and media management.

800-231-9673
www.broadcast.harris.com

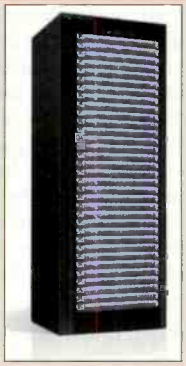
WEB-BASED COLLABORATION PLATFORM
ScheduALL AVvA

Connects media and broadcast companies for collaboration; enables freelancers, equipment providers, truck companies and others to make their services, resources and specific pricing available selectively or to the entire AVvA partner network at no cost; users can identify resources by specialty, location and price, and anyone in the industry can connect with any other party; available via any Internet connection; built on Microsoft.NET and Silverlight to deliver an RIA experience; as a hosted service, backups and updates are managed centrally.

954-334-5406; www.scheduall.com

MEDIA SERVER

Omneon MediaGrid ContentServer 2124



Combined with the latest release of MediaGrid software, V2.3, system delivers high performance and cost-efficiency for high-bandwidth production workflows; smallest MediaGrid system with just three ContentServer 2124 systems provides up to 1GB/sec in bandwidth and can support up to 100 simultaneous Final Cut Pro editors, as well as natively host transcoding and QC applications.

408-585-5000; www.omneon.com

PROFESSIONAL LCD MONITOR

JVC Vérité G

Features 3G and DualLink HD/SD-SDI (1080p/60 4:4:4) inputs; comes in both 17in and 24in sizes; designed for broadcast, studio, mobile and field applications that demand accurate color rendition for critical image evaluation; offers built-in waveform monitor with overlevel function, vectorscope with selectable size and position, advanced audio level meter, and LTC/VITC time code support; non-glossy LCD panel provides improved picture quality and maintains accurate color at wide viewing angles; provides 10-bit 1080p processing with less than one frame of latency.

800-582-5825; http://pro.jvc.com

MEDIA WORKFLOW

Sony Media Backbone

Suite of products and planned technologies supporting networked content workflow; includes Media Backbone Conductor, which manages media workflows between content production services and business processes; Media Backbone Ensemble manages ingest and archive workflows, and connects to the Media Backbone Conductor, which interfaces with third-party platforms; system built on SOA techniques.

201-930-1000; http://pro.sony.com

HD CAMERA

Panasonic AG-AF100

4/3in video camcorder is optimized for HD applications; offers native 1080/24p recording, full 1080 and 720 production, variable frame rates, professional audio capabilities; compatible with SDHC and SDXC media; two SD slots allow up to 12 hours on two 64GB SDXC cards in PH mode.

877-803-8492
www.panasonic.com/business-solutions

WIDE ANGLE LENS
Thales Angenieux 14 x 4.5

Offers a focal range of 4.5mm to 63mm and an aperture of f/1.8; weighs 4.6lbs; available in semi-servo and full servo versions, as well as with 16-bit digital connection for zoom and handle connection; complements the 19X ENG and 26X telephoto HD video lens as all three offer the longest zoom range in their respective categories.

973-812-3858; www.angenieux.com

IMAGE PROCESSOR, CONVERTER
Thinklogical ImageEvolution X3

Real-time video processing capabilities include per-pixel, motion-adaptive noise reduction, content-adaptive block and mosquito noise reduction, natural depth expansion and adaptive scaling, among others; converts and scales SD, HD, dual-link HD and 3G; provides up to 20 user-programmable presets; supports eight channels of embedded audio and ancillary data; user control is via RS-232C port for remote control or through its front-panel, multifunction selector and LCD display; can be used in stand-alone or rack-mount configurations.

203-647-8725; www.thinklogical.com

SATELLITE SERVICE
Stratos BGAN X-Stream

Allows a guaranteed minimum symmetrical video streaming rate of 384kb/s, with up to 450kb/s expected under optimal conditions; is supported only by Class 1 BGAN terminals; access to BGAN X-Stream does not require an additional external antenna or any other supplementary hardware.

709-748-4226
www.stratosglobal.com

NETWORK MANAGEMENT SOFTWARE
Rohde & Schwarz TS4570

Can be installed on a standard industrial computer and perform all the operations at remote site; communicates with all SNMP-capable transmitters and monitoring equipment independent of the manufacturer; non-SNMP equipment like cooling systems, emergency power supplies and other site components are monitored via a parallel I/O port or SNMP converter; can also integrate numerous transmitter sites into a single unified system.

410-910-7800
www.rohde-schwarz.com

SPECIAL VENUE PLAYBACK SERVER
Doremi DSV-J2

2D, 3D and stereoscopic digital playback device is designed for large-screen venues; supports resolutions up to 4K; features MPEG-2 MXF and visually lossless JPEG2000 MXF file playback; offers eight channels of high-quality uncompressed audio via balanced digital AES/EBU or optional analog audio; provides frame-accurate LTC time code output to synchronize external equipment.

818-562-1101; www.doremilabs.com

MULTICHANNEL LEVEL CONTROL
Ward-Beck Systems MLC8

Handles AES, Dolby E, Dolby AC3, analog audio or HD/SD embedded signals; equipped with eight LED bargraph level displays, individual channel and master level control with mute function, level status LED indicators, presets and toggling between 5.1 and stereo listening, and 7.1 and 5.1 to stereo mix-down capability.

416-335-5999; www.ward-beck.com

CAMERA-SWITCHING UNIT
Ikegami CSU-3D

Supports up to four pairs of HD cameras for use in shooting stereoscopic 3-D television productions; working together with a maintenance control panel and four operation control panels, the unit provides extensive set-up control for optimization of each camera and subsequent parallel operational control for the four pairs of HD cameras; ensures that any subsequent camera adjustments are shared precisely by each camera pair, thus maintaining matched camera settings for optimum 3-D HD image capture.

201-368-9171; www.ikegami.com

MULTIVIEWERS
Apantac Tahoma DE series

Each input can be configured to autodetect four, eight, 12 or 16 HDMI/DVI/VGA/YPbPr/YC/composite sources or an optional HD/SD-SDI source; support eight high-resolution inputs in 1RU or 16 high-resolution inputs in 2RU; series includes four models and an integrated CATx extender for extending sources up to 115ft.

503-616-3711; www.apantac.com

BROADCAST STEREO HEADSET
Audio-Technica BPHS1

Created especially for on-air news and sports applications; cardioid microphone pattern provides maximum voice intelligibility; closed-back circumaural ear cups reduces crowd noise; neodymium magnets in microphone and headphones provide high output; boom mic can be positioned either right or left; user-replaceable cable and ear pads.

330-686-2600
www.audiotechnica.com

FRESNEL LIGHTS
Litepanels Sola series

Offer beam control of 70° to 10°; feature instant dimming from 100 percent to 0 with no noticeable color shift; provide the control and single-shadow properties inherent in a Fresnel light but use a fraction of the power of conventional fixtures; SolaENG provides manual focus and dimming control via camera lens style ergonomic controls; Sola6 and Sola12 provide on-fixture motorized control of focus and local dimming via a touch-screen and are also remote-controllable via their integrated DMX interface.

818-752-7009; www.litepanels.com

CHARACTER GENERATOR
Brainstorm Aston 7

Provides real-time 3D preview and playout, as well as easy editing and preview on a PC or laptop; integrates with external systems such as newsrooms, automation controllers, asset management servers and external content feeds; system is comprised of an edit workstation and one TX playout unit; is fully scalable; features include timeline view and simultaneous pre-buffering of multiple pages.

646-688-4493
www.brainstormamerica.com

SCAN CONVERTER
Analog Way TetraVIO

Universal A/V computer and HD cross-conversion with digital audio de/embedder features a built-in TBC, switcher and interface; handles up to 2K images; HDCP-compliant; output provides the same diversity of formats, signals and connectors.

212 269 1902; www.analogway.com

RECORDING CONTROL
Haivision Video VFiControl

Application for the iPhone/iPad platform allows users to initiate recordings and add metadata (HotMarks) on the fly during a recording session; users can instantly review the recording directly on their mobile device prior to publishing the recording directly to the Furnace IP Video System.

847-362-6800; www.haivision.com

GAP FILLER
Linear Industries ATG20P

Can be used as a distributed translator network on the same channel and can improve signal levels for mobile ATSC needs; features 20W RF output, echo cancellation, automatic gain control, one-click linear and nonlinear precorrection, automatic power limit, gain-margin monitoring, front-panel four-line by 40-column digital display, RF I/O UHF frequency range (Channels 14-69) and active bandwidth of 6MHz.

847-428-5793; www.linear-tv.com

MPEG-2 HD/SD MULTICHANNEL ENCODER
NTT Electronics MPC1010

Can be installed with multiple MPEG-2 HDTV/SDTV encoders, which allows for high image quality and high reliability; supports both HDTV (1080i and 720p) and SDTV (480i) standards with encoder IC that provides high-quality MPEG-2 videos; complies with ATSC standard, including TS mux and PSIP generation features; features maximum four-channel encoder and DVB-ASI, SMPTE-310M and IP output.

+81 45 414 9130
www.ntt-electronics.com

BEND-TOLERANT CABLE
Optical Cable High-Density Bend-Tolerant Cable

Designed for use in truck, LAN, data center, 40/100GigE and other applications where small size, light weight and small bend radii are needed; increases capacity in tray systems, improves cable management, increases cooling efficiency and reduces cost for under-raised-floor cabling systems; offers negligible loss, exceeds ITU-T-G.657.A2 standards for bending performance and has a tighter bend performance than many similar products.

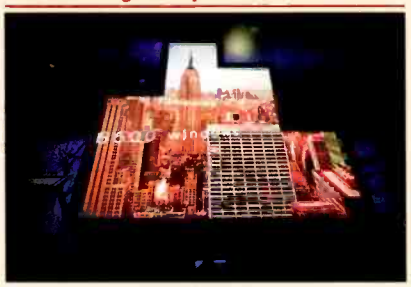
540-265-0690; www.occfiber.com

MODULAR FIBER RACK SYSTEM
Clark Wire & Cable ModBox

Configurable, field-deployable solution for SMPTE 304M hybrid fiber connectors; available in self-contained breakout modules or flat-panel bulkhead mount connectors; up to eight different connector modules can be mixed and matched within a single 2RU frame; features a full cable management system at the rear of the chassis for securing component and hybrid cables.

847-949-9944; www.clarkwire.com

DIGITAL DISPLAY TILES
Christie Digital Systems MicroTiles



Can be stacked and clustered like building blocks to create display walls of any shape or scale; offer superior color and image reproduction, wide viewing angles and only 1mm gap between tiles; based on LED and DLP technologies; rated at 65,000 hours to half brightness usage or nearly 7.5 years of continuous operation; feature a screen size of 16in x 12in x 10in; require 2in of minimal clearance for rear ventilation; include built-in sensors that automatically perform color calibration.

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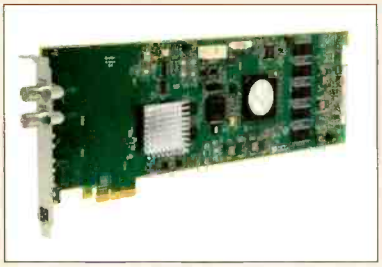

Advanced, onboard, real-time video preprocessing features including motion-adaptive deinterlacing with pixel-level analysis and video noise reduction groom the input signal to be more compression-friendly, enabling the most efficient use of bandwidth in the compressed output; integrated up/down/crossconversion provides high-quality conversion between SD, HD and 3G-SDI formats and frame rates; additional features include video adjustments, color space conversion and graphic overlay.

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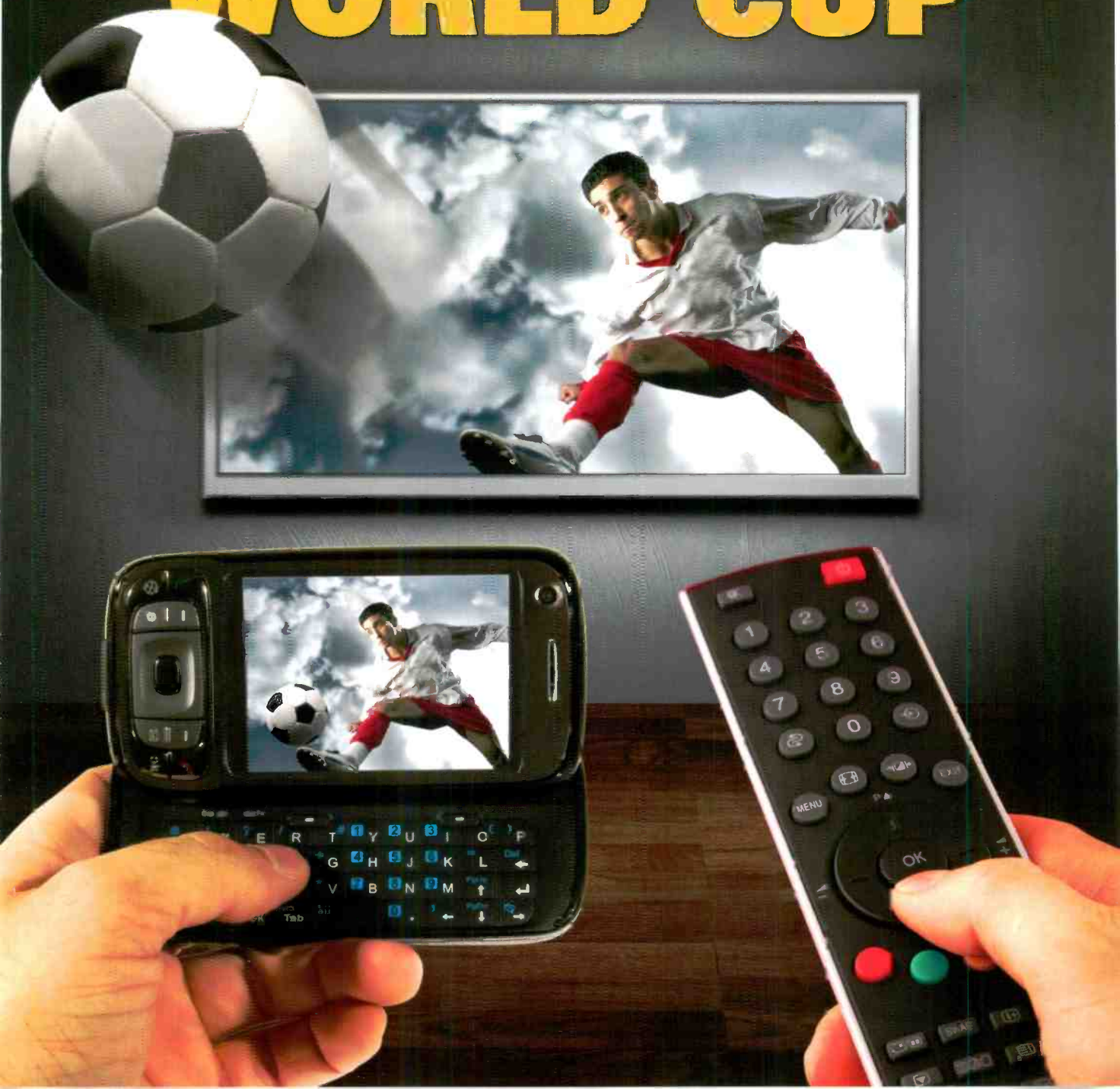
JUNE 2010

A SPECIAL REPORT

2010 FIFA WORLD CUP



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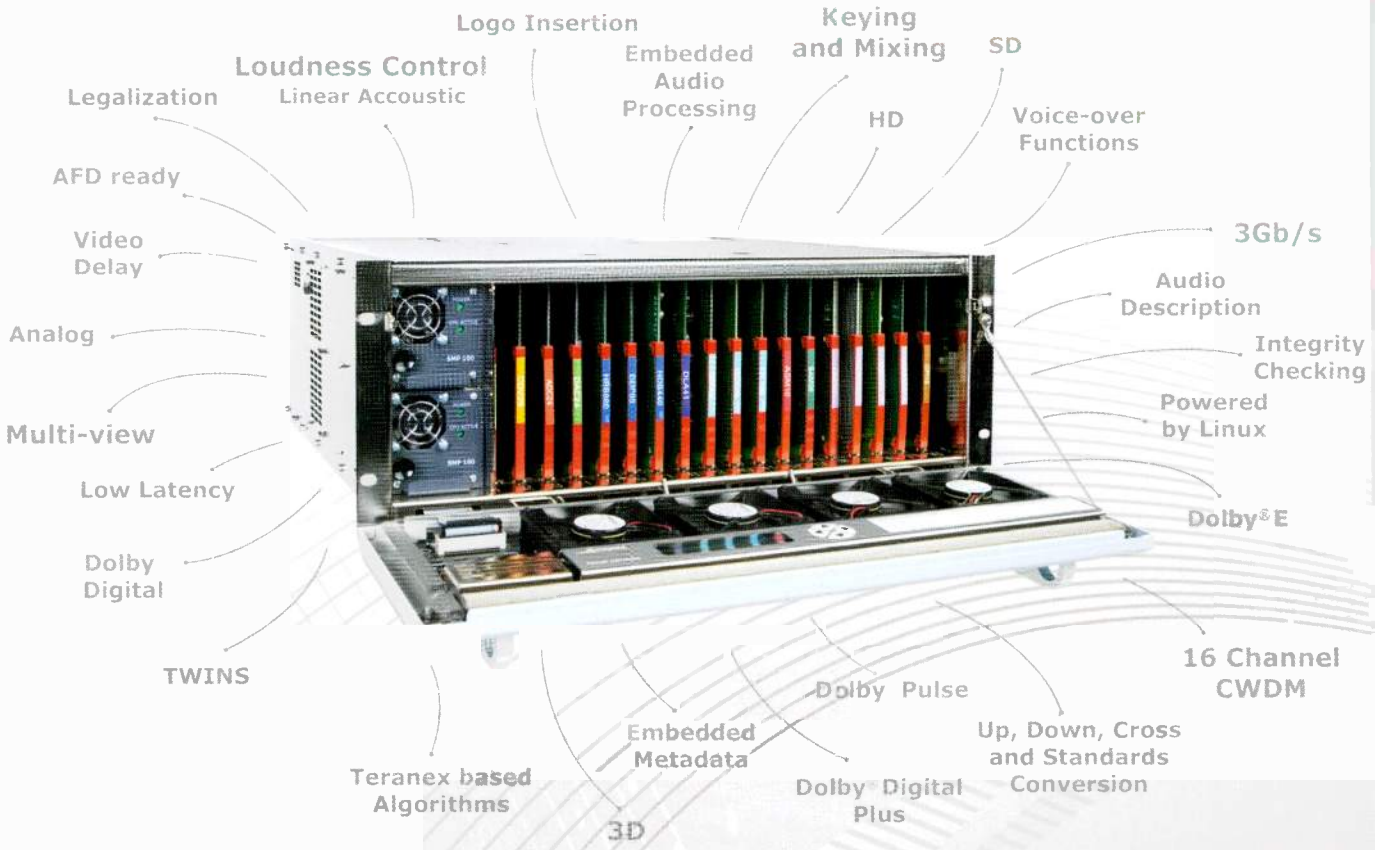

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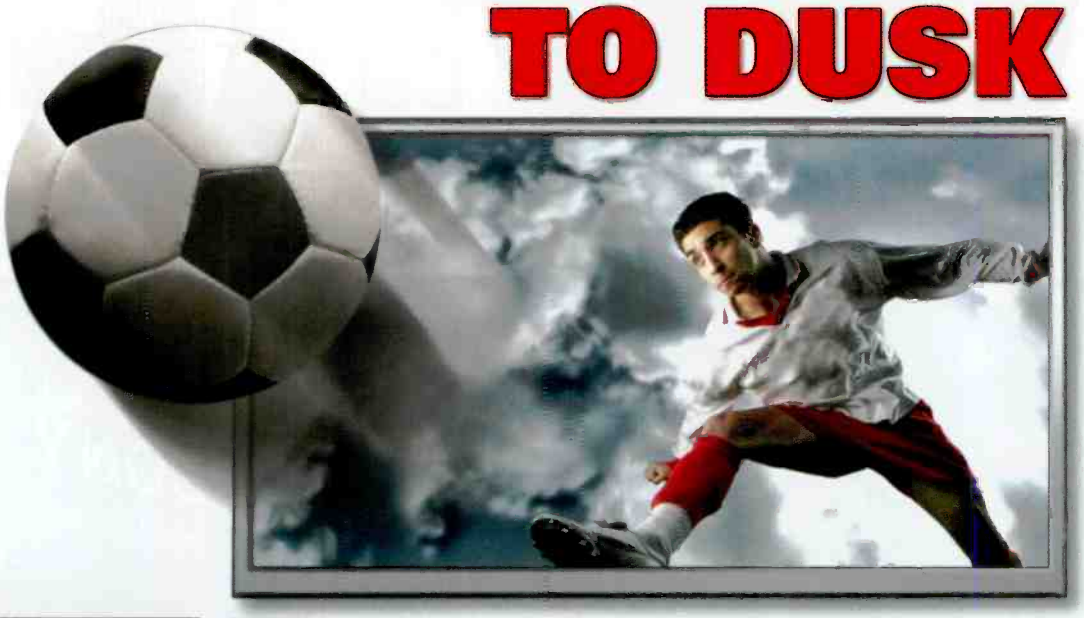


CONTENTS

The FIFA World Cup will undoubtedly be a showcase of sports production techniques. As one of the most-watched international events on the sporting calendar, the expectations from fans are high. South Africa was not well-endowed with suitable venues, because existing facilities were designed more for rugby and cricket, but the World Cup has brought with it excellent, purpose-designed football stadiums.

The country also did not have the technical resources for such a mammoth event, so a veritable army of production personnel and technicians have travelled, largely from Western Europe, to the southern hemisphere to provide coverage of the month-long event.

Up-and-coming broadcast technology is sure to provide compelling coverage, as well as — for the first time for some lucky viewers — coverage in 3-D. The 3-D coverage should prove to be a milestone. In the last year, production techniques have been honed and new equipment developed to process the stereo signals. These techniques and technologies will surely be tested, with 25 consecutive matches being covered in 3-D. Those in charge of the 3-D broadcasts are looking for the World Cup to establish the technology as a normal (if expensive) way to cover major events, and prove that it is no longer just an experiment.

For most fans, however, the most useful innovation will be the mobile TV coverage; the event will surely test the capacity of 3G networks worldwide. Detailed mobile coverage will not only stream the matches, but also it will provide around-the-clock coverage of training camps, team interviews and all of the background information that the fans live for.

2010 FIFA WORLD

The AMP Car 8 mobile truck provides facilities for 3-D coverage of the World Cup. The truck supports 16 cameras.

CUP

BY DAVID AUSTERBERRY

BROADCASTERS PLAN TO PULL OFF A LOGISTICAL FEAT.

Every four years, football teams from 32 nations compete for the Fédération Internationale de Football Association (FIFA) World Cup. This major sporting tournament has always attracted comprehensive television coverage, and this year promises to be even better with some matches shot in 3-D, a special feed for mobile devices and the standard HD feeds.

Behind the scenes, the big innovation is the enhanced workflow made possible by a large media server at the International Broadcast Center (IBC), which makes all the feeds and clips available immediately so broadcasters can create their own programming.

The 32 teams competing for the World Cup Finals play from kickoff on Friday, 11 June, to the final on Sunday, 11 July. These teams have reached the finals through a series of qualifying rounds, which 204 nations played in over the last three years, and were selected in a final draw that took place in South Africa last December.

The first round is in groups of four, eliminating teams down to a second round of 16 teams. Eight teams then compete in the quarterfinals, followed by semifinals. The final round decides the winner as well as third and fourth places, and the entire final comprises 64 matches. The games are played in 10 stadiums in nine cities spread across the host nation of South Africa.

Football has always been a huge draw for TV viewers, and the statistics for the 2006 event confirm the huge global following. The estimated audience for the 2006 final was 715 million, and the total cumulative television audience for the tournament was 26.29 billion, making it the world's most popular television event. The rights are expected to generate revenue of at least $1.6 billion for FIFA.

Host Broadcast Services

The organizing body, FIFA, appointed Host Broadcast Services (HBS) to be the host broadcaster for the World Cup tournament. HBS was previously the host broadcaster of the 2002 and 2006 FIFA World Cup tournaments, and has also been appointed as host broadcaster for the 2014 FIFA World Cup in Brazil. HBS is owned by sports marketing company Infront Sports and Media, based in Switzerland.

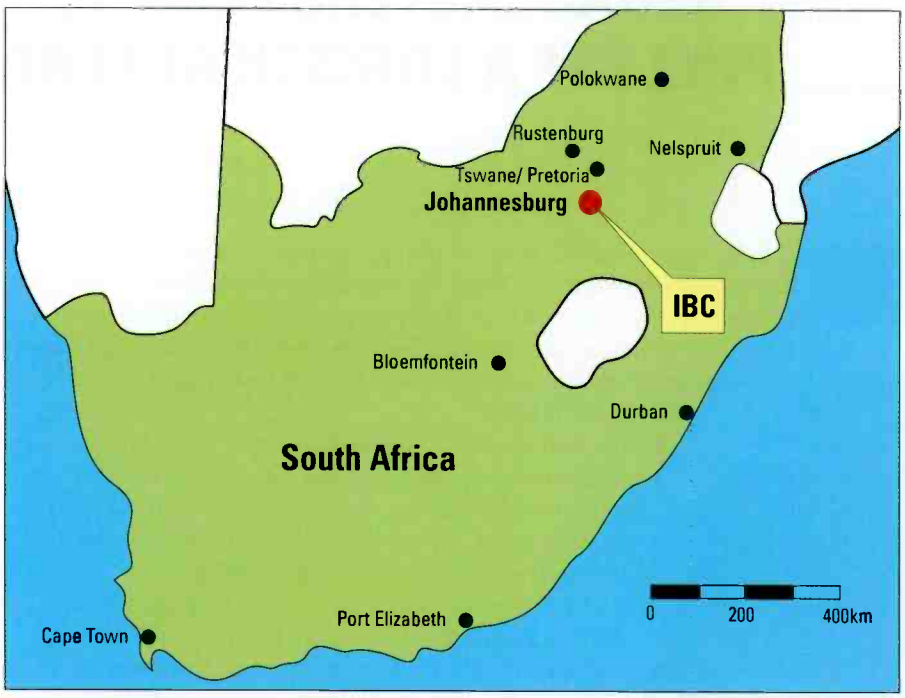


Figure 1. The World Cup Finals are played at 10 venues across South Africa.

As host broadcaster, HBS is responsible for production of each match, for facilities at the venues for other broadcasters and for the IBC in Johannesburg, the nerve center of the operation.

The coverage has to cater to a wide range of media rights licensees (MRLs), which is FIFA's term for media organizations that have licenses to air the matches. MRLs include broadcasters, new media platforms and mobile network operators (MNOs).

MLRs have a choice of using feeds at the venue for a bespoke production, feeds at the IBC or just taking the finished show feed (ESF or EBIF). Many national broadcasters have their own production facilities at the venues. They can take the clean feed from the production switcher to add their own graphics plus ISO feeds of the cameras, so they can feature their home team.

The big advantage of having a host broadcaster is that high-quality coverage is maintained throughout the tournament. Although many national broadcasters want to fully cover the event, any investment must take into account the risk that their national team falls out at the first round and returns home early.

All production is 1080i25, but recognizing that the largest number of viewers will be watching analog 4:3, the production is designed to protect a 4:3 aspect ratio.

This year there will be innovations. After visiting IBC in 2009, HBS decided that it was feasible to cover the World Cup in 3-D. It has not been possible to cover all 64 matches as there is worldwide shortage of 3-D equipment and experienced stereographers, but 25 of the matches will be shot in 3-D. Two broadcasters, ESPN is the USA and Sogecable in Spain, have become MRLs for the 3-D coverage, with TF1 in France making a late announcement of the intention to license coverage. As of press time, ESPN was aiming to debut its 3-D network with the South Africa versus Mexico match 11 June.

Mobile coverage is also getting an upgrade with a dedicated camera and a separate feed featuring tighter shots more suited to the small screen. Mobile coverage is important, as most fans will not be near a TV receiver during working hours but can keep in touch with all the news via their phones.

At the venue

At each of the 10 stadium (see Figure 1), HBS has built a full OB facility using flyaways. Grass Valley is providing facilities through partners such as production companies Alfacam, CTV, Mediapro, Studio Berlin and VCF France. Alfacam alone is providing 170 cameras and 155 technicians to help cover the event for HBS and for MRLs. The technical operations centers (TOC) at the venues are again supplied by Grass Valley through partner Gearhouse Broadcast.

Expensive equipment, such as cameras and lenses, is shared and moved between the venues as needed. The camera plan has been extended beyond the 2006 event, where 26 cameras were used. (See Figure 2 on page S8.) The primary cameras are Grass Valley LDK 6000/8000 WorldCams. A total of six Grass Valley LDK 8300 Super SloMo 3X cameras and two ultra-motion cameras provide for playback of players and goals.

The main camera platform in the stadium has the cameras for wide, medium close-up and close-up shots, plus the A and B player cameras. An additional camera will be dedicated to the mobile TV coverage.

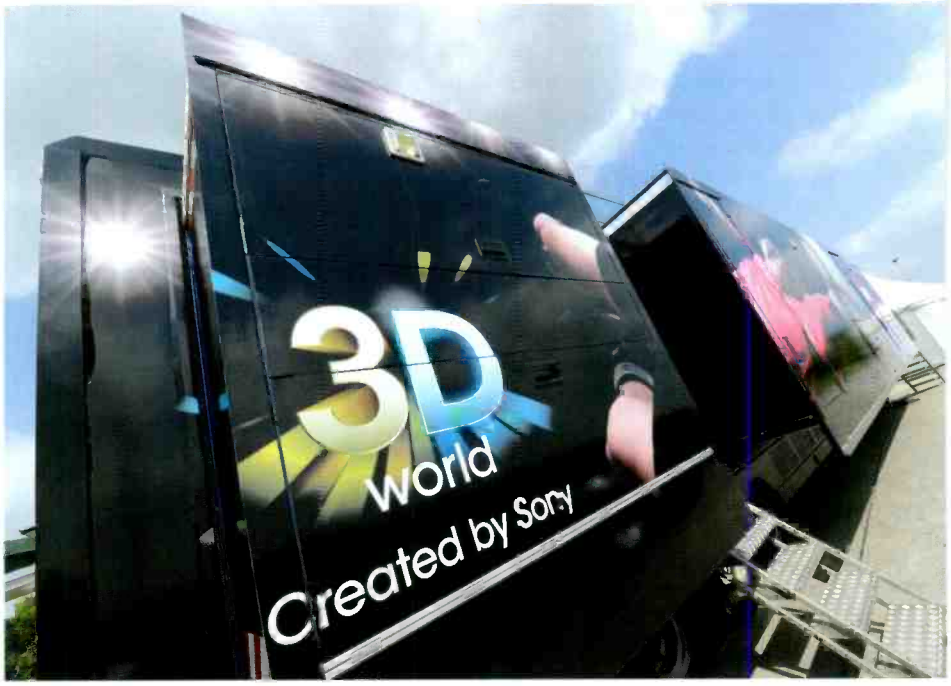
Behind each goal line is a wide-angle box camera (goalcam), a crane, a

super-slow-motion and an ultra-motion camera. In line with the goals are box cameras and super-slow-motion cameras. With eight high-speed cameras available, there should be every opportunity to analyze the play in detail.

For general pitch coverage, there are two steadicams, a close-up camera and a minicrane, which is used before the match for interviews.

Other cameras cover tactics, a beauty shot of the stadium and views of the benches. Selected matches have aerial coverage before the match and a Spidercam cable camera for use during the game.For some matches, there are additional stereoscopic camera rigs for the special 3-D coverage.

In addition to the extended stadium feed (ESF), a clean feed, the mobile feed and a beauty shot of the stadium are all fed back to the media



The AMP 3-D truck uses Sony HDC-1500 cameras with Element Technica rigs, which can be set up in side-by-side or beam-splitter configurations.

server at the IBC. The team A and B and player A and B camera feeds also are returned to the IBC for recording on the media server and for use by MRLs that are at the IBC but don't have facilities at the venue. (See Figure 3 on page S10.)

The OBs use a variety of Grass Valley switchers, including Kayenne 4M/E and Kayak 1M/E units. A total of 10 Kayenne HD and 30 Kayak HD units are used across the venues for the broadcast feeds and to feed the stadium display screens.

HBS aims to produce each match with a neutral style, favoring neither team. One rule is live coverage only when the ball is in play, with slow-motion replay only when pertinent. The production is delivered to audiences with different expectations — football experts and ordinary viewers — plus different nations deliver football in different ways. Some still use only five cameras to cover a game. In addition, viewers are watching on a wide variety of devices, including small analog portables and PCs.

Many leading broadcasters have OB facilities at the stadiums to cover their national teams and can produce more partisan coverage.

For HBS production, the director at each venue uses a production crew of 50, including cameramen, production switching and EVS operators. There are additional HBS technical crew at each venue.

Camera feeds are recorded to EVS production servers at the venue. The best clips and sequences are transferred from the TOC to the FIFA MAX media server at the IBC in Johannesburg.

Mediabroadcast provides backhaul services from the venues to the IBC. The company is a partnership between Media Broadcast and local systems integrator Telecom 180. Mediabroadcast uses the infrastructure and network of South African telco Telkom, which provides the high-bandwidth fiber circuits for the IP-based broadcast contribution network.

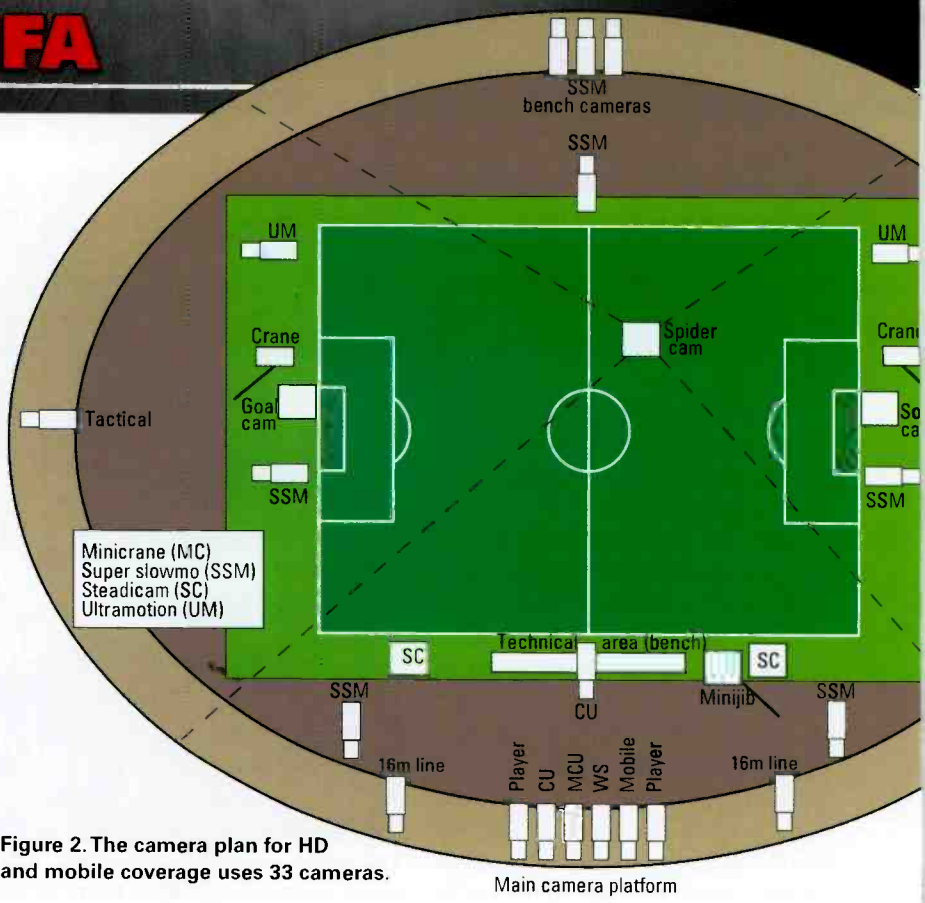


Figure 2. The camera plan for HD and mobile coverage uses 33 cameras.

Graphics

Sports graphics specialist Delta Tre is providing the graphics for the main feed. To allow broadcasters to add their own graphics, only the lower half of the frame is used for Delta Tre graphics.

Players and the ball are tracked to create stats for MRLs to use in their analysis of games using statistical analytics software MAGMA Pro (Match Analysis Graphics Machine) from Delta Tre, powered by Piero. HBS production teams are able to replay pictures integrated with MAGMA Pro data from the FIFA MAX server to create analysis of key moments such as goals and the position of every player on the pitch.

The software identifies patterns, categorizes them and grades them. Producers can search the database to find the key moments and preview relevant clips from their desktops. The data can be output as statistics on screen or can be fused with the clips and pushed to Piero, which automatically adds the virtual graphics effects.

As part of the production philosophy to create clean coverage following the main action, graphics effects like virtual offside lines are used sparingly.

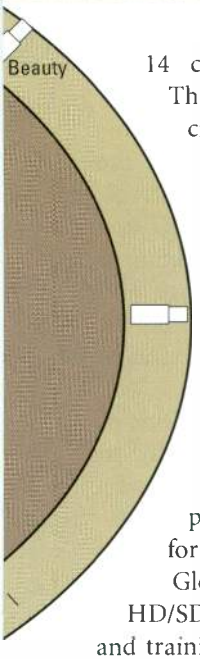
Audio and commentary

HBS must cater to viewers listening in mono all the way through to 5.1 audio on a home theater system. To meet varying requirements, a TV stereo mix, a radio stereo mix and a 5.1 mix (encoded Dolby E) are created by HBS. Twelve pitch microphones, some surround, pick up crowd sound and atmosphere. The basic commentary is in English and is provided as an extra channel.

At each venue, a commentary control room provides all the facilities for the commentators from the MRLs. HBS uses its stock of Glensound commentary boxes that were specially customized to its requirements.

ENG

For this World Cup, HBS has expanded the number of ENG crews covering the teams and added crews to shoot general supporting features. At the 2006 event in Germany,



14 crews covered the teams. This time there are 32 ENG crews, equal to the number of competing teams, that film teams the day prior to a match (MD-1) and cover team press conferences. An additional eight crews shoot feature material for use in the "world package" for the EBIF feed. The crews use Panasonic P2 HD camcorders, with Mediabroadcast providing DSNG facilities for backhaul to the IBC.

GlobeCast is providing 12 HD/SD SNG uplinks at venues and training camps for many of the international broadcasters that are covering the tournament.

International Broadcast Center

The hub of the broadcast operations is the IBC at the Johannesburg Expo Center. The IBC has areas for HBS facilities, including the master control room (MCR) and the central equipment room (CER). Other areas are available for the MRLs to set up their own facilities. To cope with the vagaries of local power, the center has dual redundant power generation with a generous over capacity.

Adjacent to the Expo Center is a 5000sq-m dish farm for the contribution and distribution links.

At the heart of the IBC is the FIFA Media Asset Exchange (MAX) server. HBS loads match feeds, clips, highlights, city profiles, ENG material and any other material that is needed by the MRLs to create their own packages. During each match, the servers capture nine feeds per venue. In all, 3000 hours of HD material will be available to broadcasters. The material is stored as DVCPRO HD format at 100Mb/s, but clips also are available in SD as DVCPRO 25.

Many MRLs shoot their own material, and they can load clips that they wish to offer to other MRLs in a "media stock exchange," also hosted on the MAX server cluster.

As material is ingested, HBS loggers add descriptive metadata to the clips. The tagging operators have eight workstations.

Distribution

Distribution of the matches and associated reporting are over a combination of satellite and fiber. One supplier alone is providing 1300Mb/s of fiber capacity out of South Africa with full redundancy. Mediabroadcast is providing links from the IBC back to Frankfurt and Paris using undersea fiber to feed European broadcasters.

Net Insight is supporting a wide range of contributions to North and South American and European broadcasters from South Africa with a video-over-IP transport infrastructure. The company has been contracted by EPSN to manage the distribution of feeds from South Africa along undersea fiber-optic cables into the broadcaster's New York hub. ESPN then routes on to affiliates in South America.

The satellite teleport and telecommunications infrastructure for the World Cup supports transmission capacity of 40Gb/s and will be used after the World Cup to provide broadband services to South Africa.

Eutelsat has four satellites — W2A, W3A, W4 and W7 — covering Europe, Africa and the Middle East that are available for use by MRLs to distribute the tournament to their viewers. The EBU has added two transponders on W2A to bring back matches, reports and highlights to its HQ in Geneva for distribution via W2A and W3A to its 75 members. Nimbra transports the host feed to Eurovision, the terrestrial network services wing of the EBU, which acts on behalf of Europe's public broadcasters.

Other clients providing services for the tournament include GlobeCast, APTN, Arqiva, Telenor and TV.

Although the matches must be live, much of the background coverage is not so time-sensitive. Some broadcasters are using WAN acceleration techniques to deliver coverage like clips of training sessions and team interviews as files using the public Internet. This method can represent a big cost saving over satellite circuits and fiber.

Although 3-D may catch the headlines, 2010 is going to be the year for

Inside the AMP 3-D truck, Sony MPE200 stereo processors are used to control the stereo images.

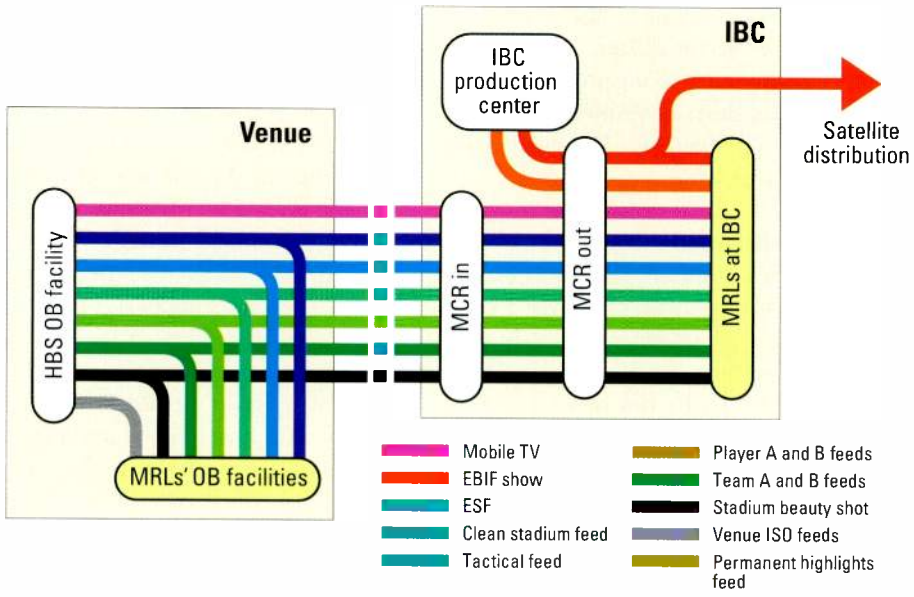


Figure 3. Nine contribution feeds are returned from each stadium to the IBC

mobile coverage. With a specially produced mobile feed rather than a transcode of the primary HD signals, mobile viewers are able to keep track of their teams' fortunes throughout the day. FIFA has partnered with Ericsson to provide content management and distribution to MNOs for what will be the most comprehensive mobile coverage of the World Cup tournament so far.

FIFA has worked with MNOs and MRLs to create content for users on a nation-by-nation basis. The focus is live match feeds composed for mobile screens and daily news and feature content based around individual national teams. This includes team arrivals, dressing room coverage, team lineups, goals, action, highlights and interviews.

3-D

This year marks the beginning of regular 3-D broadcasts. ESPN launched its 3-D network with the opening game of the tournament, South Africa versus Mexico. FIFA signed the rights agreement with Sony (also an official FIFA partner) in December 2009. HBS has taken the precaution of trialing 3-D productions with eight broadcasts of French Ligue 1 football.

The 3-D coverage is a separate production from the regular HD coverage. The 25 3-D matches are shot at five of the 10 stadiums. The Sony production uses two 3-D OB trucks from French operator AMP Visual TV and Telegenic from the UK. Both companies have considerable experience shooting 3-D events, including tennis and football.

The AMP Car 8 covers the Johannesburg matches. It is equipped with a Sony MVS 8000 switcher and the Sony MPE200 multi-image processor. In addition to the usual crew, the truck is manned by eight convergence technicians (stereographers).

At every stadium, seven or eight pairs of Sony HDC-1500s mounted on Element Technica Quasar stereo rigs are used to shoot the 3-D coverage. The cameras are fitted with Canon lenses. The rigs can be used as beam-splitter rigs for close-ups or side-by-side for long shots.

The convergence technicians manage the stereo images using the multi-image processor with MPS-3D01 stereo processing software. The processor can perform color matching, image alignment and convergence adjustment, including toe-in correction. Data is exchanged between the processors, the CCUs and the Canon digital lens servos, which enables the 3-D box to correct lens misalignment over the zoom range and drive some aspects of the rig, including the interaxial spacing.

Not many viewers out of the 750 million expected to watch the final will actually see the live 3-D. Acknowledging this reality, Sony Pictures will release the official FIFA film on 3-D Blu-ray later this year, by which time there will be many more home theater systems capable of displaying 3-D. FIFA, HBS and Sony hope that the 3-D coverage of the tournament will kick-start the industry and open up production across the world as broadcasters see what is done at the World Cup.

Summary

The World Cup regularly gets higher global viewing figures than any other sporting event, so covering this monthlong event calls for a logistical feat equaled only by covering the Summer Olympics.

The host broadcaster, HBS, has 2500 staff in South Africa for the event and has called on the services of many systems integrators and rental facilities to assist in the provision of the temporary facilities for the coverage of the World Cup.

The main coverage is HD, but for the first time, a mobile feed framed for the small screen with its own dedicated camera provides around-the-clock coverage of match preparations, comment, highlights and news for fans to watch from "breakfast to bedtime."

Viewers will not be disappointed by the coverage; whether their teams meet their expectations is another matter. **BE**

Coverage of FIFA 2010

Broadcast Engineering recently talked to Francis Tellier, the CEO of Host Broadcast Services (HBS), the host broadcaster for the 2010 FIFA World Cup. HBS is responsible for the production, broadcast venue operations and the provision of the International Broadcast Center (IBC).

Broadcast Engineering: Which is more difficult: supporting the latest technology, like stereo 3-D, or providing affordable coverage to less developed nations?

Francis Tellier: It's not which is more difficult, because we have to do both. We must provide state-of-the art coverage for the most advanced broadcasters and new media [operators], but there are other less-developed countries that cannot afford to attend the IBC, and simply take the world feed by satellite. The world feed is a turnkey editorial package that starts one hour before the match and runs 30 minutes beyond the final whistle. At the same time, we have the high-profile coverage. For [this] we put all the material on a giant media server, and they just take what they want. We produce edited features, but the Brazilians or French — for example — can re-edit the footage if they want.

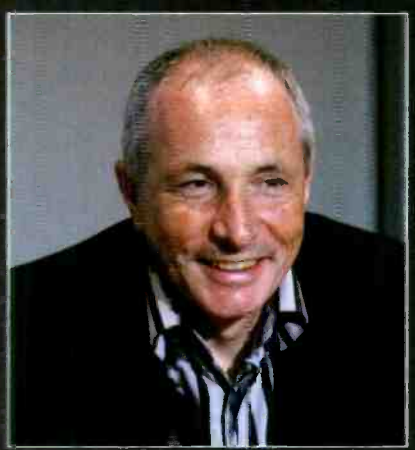
Broadcast Engineering: At each tournament, you add new technology. Over the years, what has represented the greatest leap forward?

Francis Tellier: The biggest challenge in 2002 was to deliver the coverage from two host countries, Korea and Japan. For 2006 [in Germany], the move to HD for such a big event was also a challenge, but it was decided in 2003, so there were three years to plan. This year we wanted to do 3-D, but it is going to be an additional production, and it is not going to impact the main production. Perhaps this time 3-D will be remembered. It is much earlier for 3-D today than it was for HD in 2003. 3-D is still experimental, especially for sports.

Broadcast Engineering: Are there any special challenges for FIFA 2010?

Francis Tellier: For 2010, there are new challenges. They include a large country, with two hours flight between venues.

Another problem is that the country does not generate enough electricity for all its needs, so there is often load shedding, leading to outages. The broadcast facilities will all need local generators to ensure continuity. And accommodation is a challenge in the smaller cities.



All the technical facilities are going to be imported. For 3-D, there will be flyaways — one at each stadium. We will move the expensive equipment likes lenses and cameras between stadiums. Because each venue has a flyaway setup, there is a comfort in the security of transmission.

3-D is more complicated; we have to rent Antonov freighter aircraft to deliver two OB trucks to South Africa. There is a shortage of 3-D production facilities that are available in time for the tournament, so flying in trucks at the last minute was the only option for HBS.

Broadcast Engineering: How do you rate the complexity of covering the World Cup versus the Olympics?

Francis Tellier: Our difficulties are that we only know the qualifying countries the November before, so a lot of preparation has to be last-minute. The Olympics has years to prepare.

There are nine host cities with up to 1800km between the most distant, so the World Cup is all over one country, whereas [the] Olympics is mainly in one place.

Although the [Olympics] opening ceremony has a large audience, the exposure of the World Cup is much higher than the Olympics. There is pressure during each [football] match; for the Olympics, it is just the opening ceremony.

Broadcast Engineering: Where will we see the greatest innovation?

Francis Tellier: Leaving 3-D aside, I would say the workflow, which we do for just one month. That is, making available material on the FIFA media server, files to transfer and edited material for use by new media.

Some broadcasters have taken one year to get a large media server working. We don't have that time; it has to work the first time.

We have a long relationship [with EVS]; we brainstorm with them. We suggest new products, and they work with us to develop them.

Broadcast Engineering: What about mobile TV?

Francis Tellier: We have developed several new packages for mobile network operators (MNOs) for a "breakfast to bedtime" experience. It was decided by HBS and FIFA to outsource the delivery to MNOs to Ericcson.

Mobile users will be able to receive features and information throughout the day, which complements live TV. There will be team-oriented packages offering features on your favorite team. An ENG team will follow each of the 32 qualifying teams. This will be made available to the broadcasters and MNOs. Material collected at the base camps is returned to the IBC for post production and repurposing. BE

2010 FIFA WORLD CUP TECHNOLOGY

BY SERGIO NAPOLITANO

EVS AND HBS COLLABORATE FROM INGEST TO PLAYOUT.

Appointed as the host broadcaster for the 2010 FIFA World Cup in South Africa, Host Broadcast Services (HBS) renewed its partnership with EVS to provide instant tapeless technology and support services for the production of this world-class event.

EVS technologies are involved at different levels of the host broadcast production, including the live production of the 64 matches. The OB facilities use these systems for the production of live slow-, super slow- and ultra-slow motion replays, best clip compilations, and creation of highlights packages.

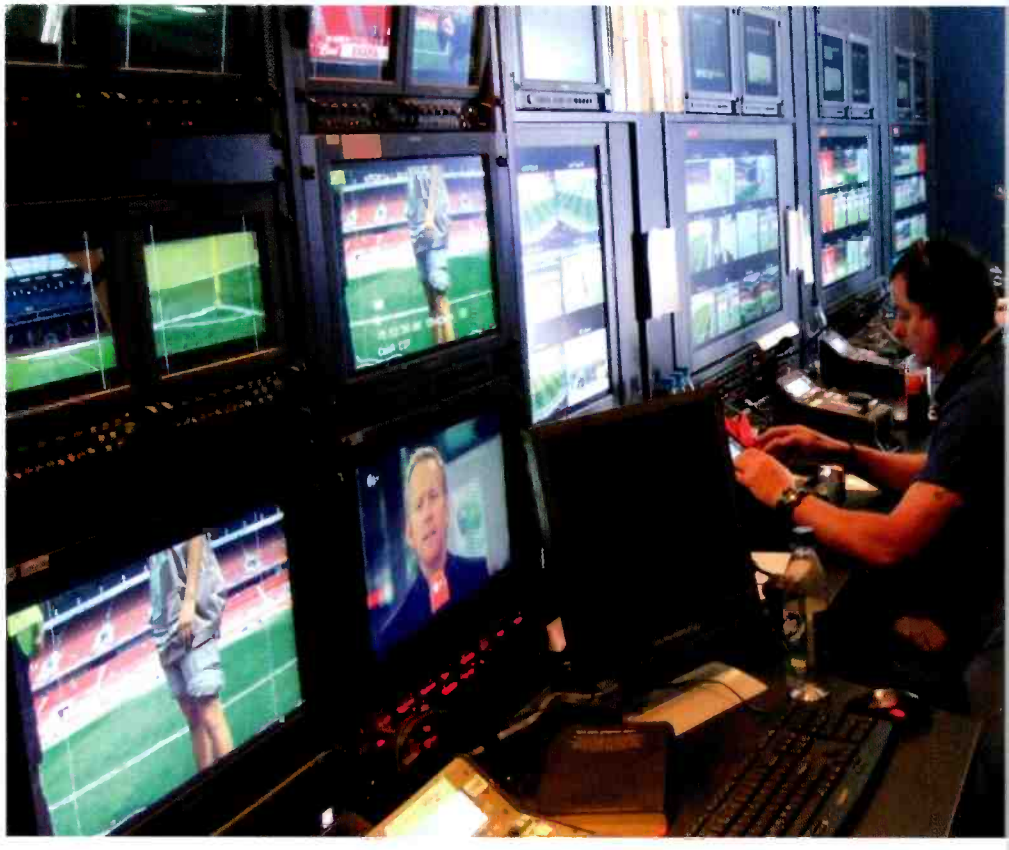
EVS also provides a full HD multiple feed ingest and media exchange using a large media server based on network XT[2] servers. This offers instant access to any content recorded during the competition with enhanced search and low-resolution browsing systems, allowing broadcasters to interchange media content.

The media recorded and logged into the media server includes nine different feeds from the pitch, plus ENG files from the 40 field reporting crews.

To maximize the remote access to the content, the broadcaster uses Web server systems already operated by HBS for the Ligue 1 Football production in France. The system enables broadcasters to access, browse and review the edited sequences produced by the ENG team at the different venues on a Web-based solution for download in SD or HD.

EVS' Xedio editing solution is being used for the production of 24/7 news programs, as well as to provide remote access to file-based ENG through the Web production system.

Different broadcasters, known as



EVS operators at the 2006 World Cup operate the slow-motion capture and replay.

media rights licensees (MRLs), are provided with browsing tools to access, review, clip and import material for their own production crews.

Last but not least, EVS systems manage the ingest of dedicated mobile feeds with live streaming onto Apple Xsan and FCP editor for instant delivery to mobile network operators (MNOs).

Production at venues

While traditional league matches are shot with an average of 12 to 18 cameras, 30 cameras are being used for the FIFA World Cup matches, plus an additional aerial camera and cable camera over the pitch for some matches.

In addition to standard cameras, HBS is operating a series of super slow- and ultra-motion cameras. To ensure the production of live replays, slow-motion action replays, highlights and closers during a live football match, all cameras are recorded on EVS video production servers installed in the outside broadcast facilities located in the broadcast compound, at the venue, during the event.

Multicamera recording

About 130 XT[2] servers are deployed in the fleet of OB trucks working at the different venues in South Africa. These digital video recorders manage the acquisition of all cameras surrounding the pitch. They are based on a loop recording process so that not even a single shot is missed. Their live-oriented architecture (with a high level of redundancy and fault tolerance, ensuring that no failure can interrupt the workflow) guarantees the level of control needed for instant replays, highlights editing, clips compilations and graphics overlay managed by the OB production team during the matches. Each server can simultaneously ingest and control up to six feeds per server.

During the production of a match, all the XT servers installed in the OBs are linked together, allowing operators and production teams to share content and control media recorded on the XT[2] network. The servers are ganged together through a dual media sharing network consisting of an XNet[2] network based on high-bandwidth SDTI and a standard GigE network.

Any feed recorded on one server can be reviewed, converted to a clip and played out from any other server. This allows operators to exchange clips and highlights with other operators gathering all the best sequences and actions that will then be transferred to the International Broadcast Center (IBC) in Johannesburg.

During the production of the matches in the OB trucks, the large number of I/O XT channels are controlled by multiple systems, including the MulticamLSM and IPDirector.

The MulticamLSM remote controller is used for all live slow-motion, super- and ultra-motion replays, multicamera actions clipping, and quick highlight or closer creations. In addition, LSM controllers point out the offside positions of the players through the insert of a virtual offside line graphic overlay recently integrated onto the system.

The IPDirector is used for the multicamera ingest and server network control, browsing and logging operations. In addition, a timeline editing module of IPDirector, called IPEdit, will create highlights and clip compilations. With IPEdit, HBS editors benefit from instant access and control over the XT[2] recording channels, with no need for media transfer, encoding and decoding processes. The IPDirector is also used to manage the transfer of clips and sequences onto third-party post-production tools.

Live editing operations

A total of 150 MulticamLSM systems are used at the different venues for all live replays, including slow-motion, super-motion (three-phase cameras) and ultra-motion camera replays. EVS is used for all replay actions of ultra-motion camera sequences managing up to 1000 frames per second. In addition, HBS LSM operators use the system for the creation of on-the-fly highlights and closers played during slack periods or to illustrate interesting actions happening during the game, such as a goal, penalties and crowd reaction.

Clip compilation and near-live timeline editing

HBS production at the venues compiles all the best sequences and replays occurring during the matches. These sequences combined as one single feed are transferred to the IBC and ingested to the media server to be available to all HBS and MRL production teams.

The creation and gathering of clips by the HBS teams in the OB trucks at each venue is managed using MulticamLSM and IPDirector clip and playlist management tools. The clip compilation gathers all the best action recorded on the servers during the match, such as multicamera angles of goals, public reaction, and super-motion and ultra-motion sequences. To facilitate the compilation of all the best action replays, as well as player and crowd reaction clips, an HBS team working in the OBs on the IPDirector has real-time access to all logs created by another HBS team in the IBC in Johannesburg using the IPlogger interface.

IPEdit (the new timeline editor for IPDirector) is used by the OB team for the production of highlights and pregame sequences, complete with transition effects using the full timeline editing solution. Editors can access multicamera feeds instantly and add sequences and clips on their timelines with simple drag and drop actions. IPEdit is operated for short-form editing such as highlights and closer creation.

Virtual offside line creation during live production

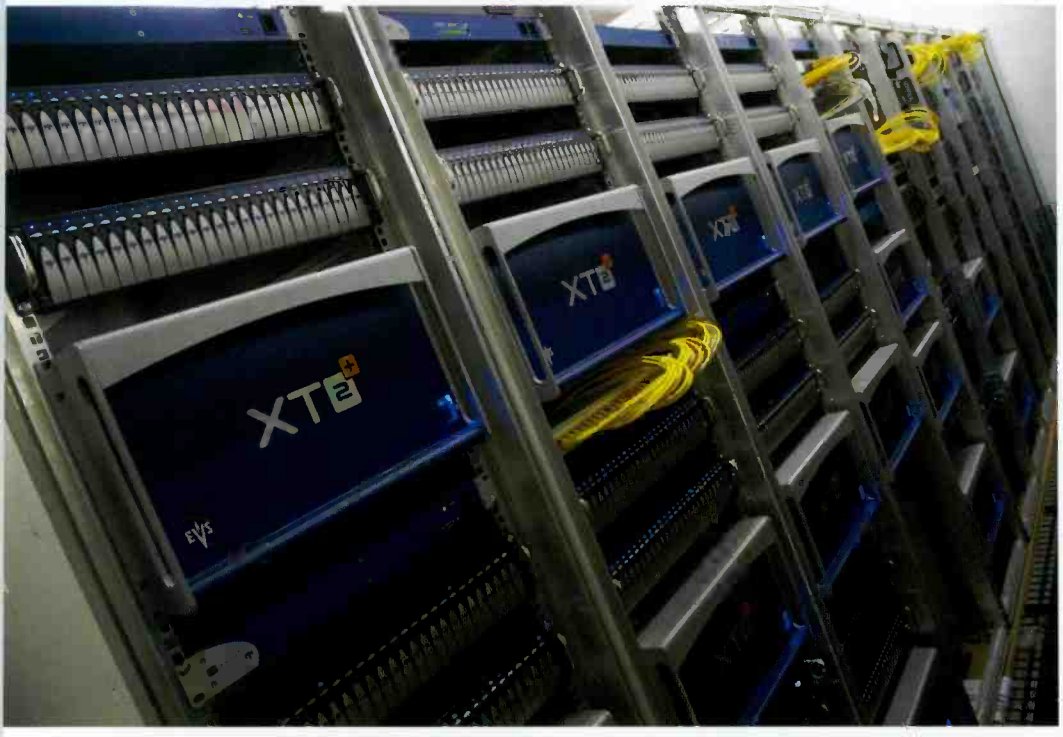
For the first time, HBS is creating virtual offside line graphics for the international feed. The offside line graphic overlay creation is managed using an EVS Epsio. This allows LSM operators to instantly generate a virtual graphic overlay with automatic recognition of the pitch boundary. The operator only has to manually trigger the offside line with the jog wheel of the LSM remote to adjust it properly. Using a one-time-per-event calibration wizard, where each camera sends images of the playing field with predefined angles into the system, Epsio can instantly and automatically recognize the playing field during actions and virtually draw the offside line along the borders of the playing field. This one-second operation is selectable with the touch of a button.

The special preview of the graphic overlay guarantees the availability of the offside line effects when the director decides to replay the action.

IBC remote browsing and transfer

Additional IPDirector browsing stations (IPBrowser) have been added to increase the availability of multicamera angles to the production teams in the IBC. They also allow unseen camera angle browsing and reviewing right after each match.

The IPBrowser in the IBC is connected to the IPDirector database in the OB truck at the venues through an Ethernet network. Operators in the IBC are able to review each clip, as well as its related, unseen camera angles. Operators can transfer the high-resolution clip back to the IBC for the preparation of news cut and edits.



EVS is providing the host broadcaster, HBS, with HD multiple feed ingest and media exchange using a media server based on a network of XT[2] servers.

The media server

HBS introduced the EVS media server in 2006 during the FIFA World Cup to expand broadcasters' creative capabilities during major sporting events. It offers the production team, as well as broadcasters around the clock, access to all the recorded media, including the director's cut, multiple camera angles, ISO camera and best clip compilation. ENG footage was made instantly available for production and post-production operations.

The media server is a fully integrated cluster of production servers. Built on instant tapeless technology, the media server combines hardware (XT[2] servers) and software solutions optimized to manage exchange and distribution of media with the maximum guarantee of speed and security, including indexing (based on intelligent logging systems) of incoming feeds and content, media backup, and archive.

For the World Cup, the media server — known as the FIFA MAX (Media Asset Exchange) — manages the ingest and the exchange of about 3000 hours of HD content. During the competition, HBS production teams and MRLs (the broadcasters) can access a wide range of A/V material, including match feeds, clips compilations, match highlights, and the ENG clips and rushes. To assist MRLs with background coverage, HBS has its own features, the FIFA tool kit, music sequences and city profiles.

Also on the server are analysis and stats, selected ISO camera recordings, team training, interviews and press conferences, plus the match day minus one highlights (MD-1).

During each match, 11 HD XT[2] servers record the nine different feeds produced by HBS, including a:

- broadcast international feed;
- clean stadium feed;
- tactical feed;
- player A camera feed;
- player B camera feed;
- team A feed;

- team B feed;
- clip compilation; and
- mobile live feed.

Logging operations

The content recorded on the media server is logged using IPDirector systems. In total, eight logging stations are used to add descriptive tags (logs) to the A/V feeds recorded on the FIFA MAX media server.

Two loggers per match (four in total, in the case of two simultaneous matches) are dedicated to logging the clean stadium feed as well as to the clip compilation feed. Three stations are dedicated to the logging of ENG material and the MRL content contributions imported onto the system. One additional station is used for supervision.

ENG operations, ingest, Web browsing

HBS deployed 40 ENG crews, with 32 crews following each playing team and eight crews spread throughout the host country gathering World Cup-related features about matches, fans, South African culture, sights and on-site events.

All crews working with Panasonic P2 camcorders send their rough cut edits and rushes to the IBC on a daily basis. These are immediately logged and made available on the media server for HBS production teams and MRLs to browse and download locally.

The rough cut operations are managed using an EVS Xedio media dispatcher system to select, group, clip, log and export P2 files — in the appropriate format — onto the media server in Johannesburg. In total, about 20 to 25 hours of content are produced and shared every day.

To increase the availability of ENG cuts to MRLs, HBS developed a new Web-based solution offering Web browsing and download capabilities to broadcasters based on the XT[2] Web systems.

The MRLs use services based on XT[2]Web technology already implemented for the Ligue 1 Football production in France. The system offers remote video and audio Web browsing and download capabilities of the ENG edits to broadcasters that opted for MRL services.

Once ingested onto the media server, ENG edits and their related metadata logs are automatically sent onto a secured Web server in proxy format (MPEG-4 H.264). MRLs at their own studios abroad can browse among the hours of edited ENG content using the keywords and descriptive metadata to facilitate their search. Once they have found and selected media (A/V or audio only) and dropped it into their baskets, MRLs can then request the high-res file either in SD or HD.

The transfer operation is automatically managed using the SmartJog system linked to the EVS database and media server. High-res audio files can simply be imported locally through the XT[2]Web solution.

Mobile live feed ingest and streaming

HBS is managing the production of a mobile feed delivered to FIFA mobile subscribers through telco networks. To offer high-quality footage, HBS is providing a dedicated mobile feed. A production team works on the mobile feed production; a special mobile production substitutes the main camera feed with a dedicated camera — also filming from the main platform — to provide closer shots and action that offer better visibility on mobile devices.

Mobile production includes a clean feed produced at the venue from the dedicated mobile camera mixed with other shots composed for the small mobile screen. A feed is sent to the IBC for the dedicated production of mobile packages, with a version produced for distribution with mobile-specific graphics for the distribution to mobile network operators.

The dedicated mobile feed produced at the venue is ingested into the media server with live streaming from an Apple Xsan server, allowing a FCP editor working on the mobile content production (voice-over, editing, specific team presentation, etc.) to edit it live. BE

Shown here are EVS servers forming the original media server concept developed for the 2006 World Cup in Germany.

Sergio Napolitano is solution marketing officer at EVS.

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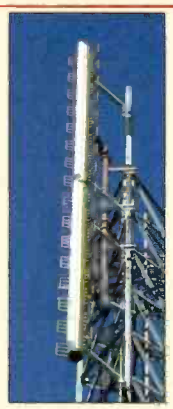

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Front Porch DIVAsolo

The system provides turnkey digitization of videotape.

BY BRIAN CAMPANOTTI

An enterprise with a significant media archive stored on videotapes has an urgent problem. Not only do videotapes deteriorate over time, but the equipment required to play them is increasingly becoming obsolete. There is a real risk that those tape-based media assets will soon be worthless.

In most organizations, it is likely that the decision-makers recognize this, but videotapes decay in silence and crying needs take priority. Add to that the perception that digitizing video assets will be disruptive, expensive and difficult, and you have a recipe for procrastination. In addition to the silent degradation of these valuable assets, overall accessibility to these aging assets is a predictable and significant barrier to effective reuse and repurposing.

To preserve and assure access to valuable media for the future, there are a couple of potential strategies. One is for the enterprise to develop its own digitization solution relying on VTRs connected to a generic encoding device controlled by a video professional. But digitizing is more complicated than mere dubbing, and unless an organization's video collection is tiny, a homegrown solution will be extremely time-consuming and may even create unforeseen problems. For example, running a VTR requires some technical training, and even then there is the risk of human error. In the worst case, a technical glitch introduced to the media in the digitization process may remain undiscovered until some future date when urgently needed content is found to be unavailable. Add to this the choice of encoding format, bit rate, file wrapper, etc., and it can become an ominous challenge.

Even for content that is digitized with errors, challenges remain. Archiving is a discipline unto itself, requiring thorough consideration of how files and their component parts ought to be labeled, categorized and identified so that the appropriate people will always have access to them.

Given the pitfalls of developing a homegrown digitization solution, an enterprise is likely to seek something off the shelf. Front Porch Digital offers this technology in its DIVAsolo system. This semiautomated, end-to-end solution speeds, simplifies and lowers the cost of analog-to-digital media migration. In addition, it provides a well-thought-out path whereby the media flows in quality-controlled form into a tracked management system from which it can be easily found, retrieved and repurposed. This solution has proven its effectiveness at media enterprises as varied as broadcasters, government agencies and regional nonprofit museums.

The system combines three components: a professional migration appliance that performs real-time, parallel-multiformat and multiwrapper encoding of content stored on videotape; an advanced content storage management (CSM) system to handle the storage, archive and protection of encoded files; and a browser-based media asset manager that affords distributed desktop access to the content, proxies and metadata now and in the future.

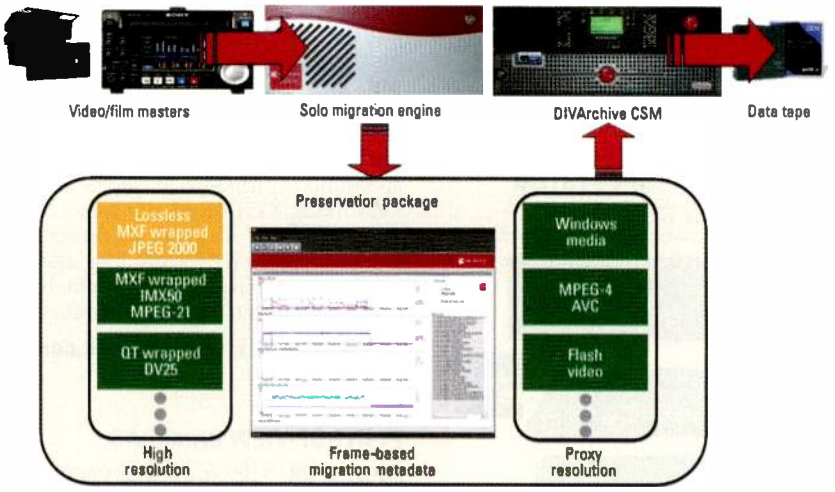


Figure 1. The Front Porch Digital DIVAsolo system simplifies the digitization of videotapes.

This turnkey solution surmounts the challenges an enterprise would encounter in trying to develop its own solution. For example, it automates quality control by relying on advanced signal analysis to perform all but the preliminary evaluation of the videotape, and monitors

A semiautomated, end-to-end solution speeds, simplifies and lowers the cost of analog-to-digital media migration.

the digitization process itself so any problems are flagged and can be fixed. Likewise, the system associates not only technical but cataloging metadata to each file at the time of ingest so that once the files are in digital form they can be identified, retrieved and even browsed from the user's desktop.

The migration process is straightforward. The system automates the cueing, migration, storage, preservation and controlled access to all migrated content. As migration progresses, comprehensive frame-accurate metadata detailing quality is captured and stored for later reference along with automatically generated shot lists identifying cuts contained on the original videotape assets, simplifying later repurposing.

Within the system, multiple high-resolution versions of the content are automatically moved to nearline spinning disk and then on to high-density LTO data tapes. The low-resolution proxy versions and associated metadata are passed to the media asset management system for desktop access.

The system automates the cueing, migration, storage, preservation and controlled access to all migrated content.

A system that simultaneously generates multiple essence formats — such as mathematically lossless JPEG2000 for preservation; MPEG-2 and DV for editing; and WMV, H.264 and Flash for proxy viewing — in a single real-time pass affords significant time-saving advantages. Relying on this technology, organizations can migrate content at speeds 10 times faster than manual methods. Besides speeding the process, the system minimizes labor expense because it can be run by nontechnical personnel such as student interns.

As evolving technology and consumer tastes create an unprecedented market for repurposed content, the potential value of archival videotape soars. So does the potential loss if that videotape is allowed to decay. Fortunately, integrated end-to-end migration systems make preserving content in digital format faster, easier and less expensive than ever, rendering yesterday's recipe for procrastination today's call to action. BE

Brian Campanotti is chief technical officer of Front Porch Digital.

Display technology

Displays are changing fast; don't be left behind.

BY JOHN LUFF

Some of us remember Conrac monitors in broadcast stations being the crème de la crème. Conrac still manufactures CRTs for broadcast use (4:3 only), but along with many other manufacturers, it will soon be out of the broadcast CRT monitor business when new and replacement CRTs are no longer available because of environmental issues. How soon will this happen? This year — now. Not ready for change? Let me try to illuminate your options.

Replacement display options

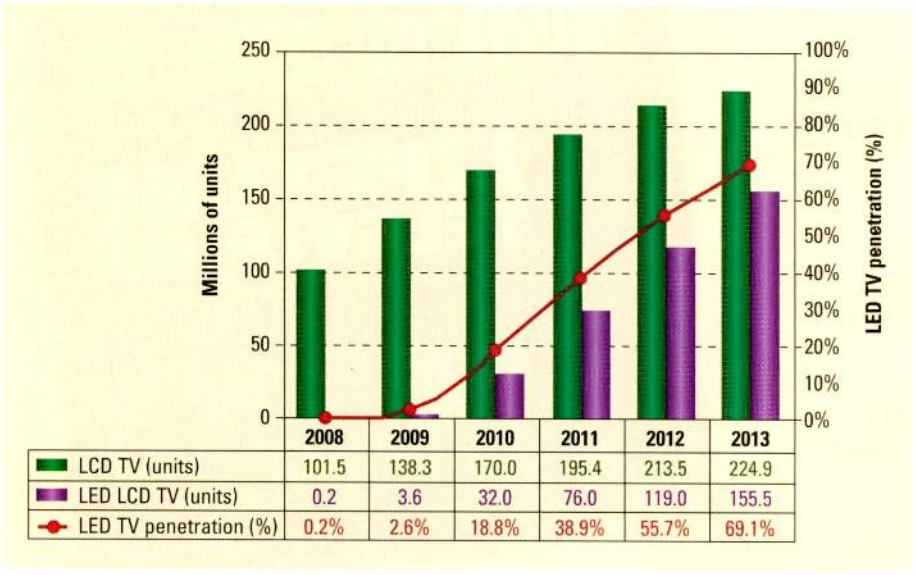
With CRTs disappearing, we're left with variants of flat-panel displays. Consumer products based on both LCD and plasma technology are readily available and of good quality. Some manufacturers buy panels from the "fab" factories in the Far East and modify the electronics to make the performance more precise, repeatable and closer in results to CRT monitors. Emerging technologies hold great promise, though they are not yet ready for commercial production in sizes applicable to most professional uses. Organic LED (OLED) technology falls into this category.

In general, the closest technology to CRTs (in terms of contrast ratio and colorimetry) is plasma. Both use phosphors and are emissive technology, but plasmas have some drawbacks. They do not modulate an electron beam per se, but rather modulate the "dwell" time for each pixel to effect amplitude modulation of the light. This means that the pixels must be flashed at a rate considerably faster than the frame rate. Brighter simply means it is on longer. Early plasmas suffered from contouring because of the appearance of insufficient pixel depth, though it was simply an artifact of the speed of modulation and number of bits used in the temporal modulation. More recent designs have largely eliminated this effect by improving the modulation near black and number of bits used to represent the pixel.

LCD monitors are transmissive, i.e. they require illumination from behind. (See Figure 1.) The ability of LCDs to make deep blacks is limited by the ability of the panel to completely cut off the backlight. They also suffer from "lag," which is the decay of pixels slower than the frame rate. Both artifacts can be ameliorated by technology. Lag can be reduced by updating the panel much faster than the frame rate, with some panels flashed at up to 480Hz in consumer displays. With arrays of LEDs in the backlight unit (BLU) behind the panel instead of continuous illumination from cold cathode light units, it is possible to turn off the light behind dark regions, improving black level substantially. At the same time, it is possible to extend color gamut to digital cinema specs and beyond by managing the color of the backlight in regions. At NAB, one manufacturer of digital cinema hardware introduced an excellent 42in panel with this technology, using all of these techniques.

OLED technology is also emissive and has been touted for years as the logical replacement for CRTs. Because OLEDs are emissive, and because the pixel sites can be quite small, OLED displays could scale to large arrays with almost unlimited resolution. Power consumption is low as well. When cells are turned off, they produce inky blacks. This sounds promising.

The problem is that volume production for either professional or consumer use in large sizes is still a ways off. Also, the state of the art still has less than satisfactory aging characteristics, though that is improving. When I asked one manufacturer of small OLED panels why it doesn't scale production up considering its superior performance, I was told the answer was economic, not technical. The same company had built a fab factory for LCDs at a cost of billions (with a "b") of dollars. I was told



	2008	2009	2010	2011	2012	2013
LCD TV (units)	101.5	138.3	170.0	195.4	213.5	224.9
LED LCD TV (units)	0.2	3.6	32.0	76.0	119.0	155.5
LED TV penetration (%)	0.2%	2.6%	18.8%	38.9%	55.7%	69.1%

Figure 1. LED backlit LCD TV penetration (Courtesy Displaybank)

OLED production would be delayed until that factory produced a sufficient LCD product. Case closed, for now at least.

Consumer display technology

If you are getting the impression that future professional monitors will be based, at least in part, on consumer technology, I think you are right. Simply put, there are not enough professional monitors to make it worth the investment to develop primary technology that cannot also be effective in consumer distribution channels. But that does not mean that

If you are getting the impression that future professional monitors will be based, at least in part, on consumer technology, I think you are right.

CRT replacements are not going to be as good, or delayed, until consumer sets are as good as professional sets. Let us not forget that consumer sets can already display the same resolution as professional monitors and are improving rapidly in other respects. For instance, LED BLUs for LCDs are in general distribution for consumer use now. A monitor with calibration features appropriate for professional use is not a daunting task. There are mainline manufacturers of monitors that participate in the professional marketplace as well, and they have a vested interest in providing high-profit, high-performance monitors to the professional marketplace.

At the same time, there are interesting technologies in development and deployment. You can now buy a consumer set with a four-color BLU, which can produce an extended gamut. Research on this was demonstrated at the 2006 Hollywood Post Alliance Technology Retreat in the United States and received considerable interest — so much interest that a patent infringement suit was filed the next year against consumer manufacturers using what was alleged to be the same approach.

Conclusion

All of this display upheaval has produced interesting effects. We used to be able to color correct to a known standard, the repeatable performance of a CRT monitor. But now film work has to use DCI color specs, often on projectors, and video production has to guess what the dominant display technology will be. Let's say the four-color display becomes dominant because of consumer interest in what might appear to be better pictures. Does a post company switch to displays replicating that approach? When can we say we know what the dominant consumer display has become? Or do we use tools that produce repeatable and scientifically correct output?

For instance, transmissive displays have a map built in to correctly display the content, knowing that the signal may have gamma assumptions that do not apply to the physics of their operation. Plasma monitors are inherently similar in physics to CRTs and don't need that correction. Can we assume that the displays have correctly adapted to the input, or has the manufacturer decided to make the picture more pleasing at the expense of accuracy? While not a scientific answer, I would opine a guess that the multitude of options available to consumers ("cinema mode," "standard" and other menu selections) means that we have to assume the worst. The only realistic answer is to produce standardized images and educate consumers and CE companies to make sure the whole distribution system permits holistic results. **BE**

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The mother of invention

Mozaik creates monetization nirvana for advertising.

BY ANTHONY R. GARGANO

Is it really *that* old? Actually, it is. That oft-used phrase referring to necessity as the mother of invention has its derivation in Book 2 of "Plato's Republic," which incredibly dates back to the fourth century B.C. The actual original phrase was: " ... and yet the true creator is necessity, who is the mother of our invention." Fast-forward two dozen centuries, and there's a unique application of that long-guiding tenet developed by a little-known startup called Mozaik Multimedia.

The DVR effect

In this era of TiVo devices and cable set-top boxes with built-in DVRs, does anyone really watch commercials anymore? Clearly, the broadcast community can ill afford to stick a fork in that advertising golden goose known as the commercial spot. The reality, though, is that DVR technology in its various forms is increasingly penetrating viewer homes, and with that time-shifting technology also comes the ability to fast-forward through commercials. Many viewers take pride in the fact that they no longer watch their favorite shows in real time; DVR viewing now allows them to watch a one-hour TV program in just 40 minutes by zipping through the ads. The DVR impact to commercial viewing is a verboten topic that is seldom discussed above whispers in the broadcast community, but its crescendoing impact is only getting louder. In April, Nielsen reported that 34 percent of TV households now have DVRs, up from just 24 percent a year earlier.

One answer to the DVR phenomenon is product placement, i.e. having identifiable products in use as part of the content storyline. This has become a widespread advertising practice but opens an interesting can of worms with regard to claims of false advertising. For example, in the recent movie "Date Night," Steve Carell's character needs to check some photos. His accommodating cab driver produces an Amazon-placed Kindle, which allows him to view the pictures. There's one minor problem. The real-life Kindle can't read flash drives, the media that's

Mozaik's !Content technology provides an interactive, end-to-end e-commerce system for consumers.

holding Carell's photos. So, does a viewer who was influenced by this scene to purchase a Kindle on which to view his flash drive photos have a false advertising claim against Amazon? We'll have to leave that one for the legal minds, but you get the idea.

Another anti-DVR scheme has been to do live commercials within the program prior to a normal commercial break. "The Tonight Show with Jay Leno" has been a pioneer with that approach.

But, let's get back to Mozaik. Its approach is to author a layer of interactivity on program content that embeds hot buttons associated with a specific product and/or talent. Thus, by clicking the appropriate hot button, the viewer can obtain further information, for example, about a particular location, item, person, service or soundtrack in the content he or she is currently watching.

What is exciting is the transaction opportunity presented when that viewer clicks on a product hot button. Mozaik's !Content technology takes this process to monetization nirvana. It creates an actionable environment between viewer and product, thus elevating product placement to a level of interactivity that is both measurable and transactionable. With just a few clicks, the viewer can place an order and make an actual purchase. Uniquely, !Content provides an end-to-end, consumer through advertiser to retail e-commerce system that offers the potential of a new revenue stream to the broadcaster. Fundamental to the process is delivery of this interactive content to the consumer. Recognizing this factor, Mozaik's business model provides for a form of revenue sharing with whoever is delivering the content.

For the viewer, the system could not be any simpler. The entire interactive portion of the experience is enabled via a standard remote control using the left/right, up/down and enter buttons, or through smart mobile devices such as Apple's iPhone or iPad.

Mozaik is already in negotiations to begin initial delivery of this new e-commerce experience. For broadcasters who have seen affiliate revenue turn into affiliate fees and whose bottom line pressures have driven significant operational retrenchment, this is clearly a Silicon Valley company to keep an eye on. BE

Anthony R. Gargano is a consultant and former industry executive.

? Send questions and comments to: anthony.gargano@penton.com

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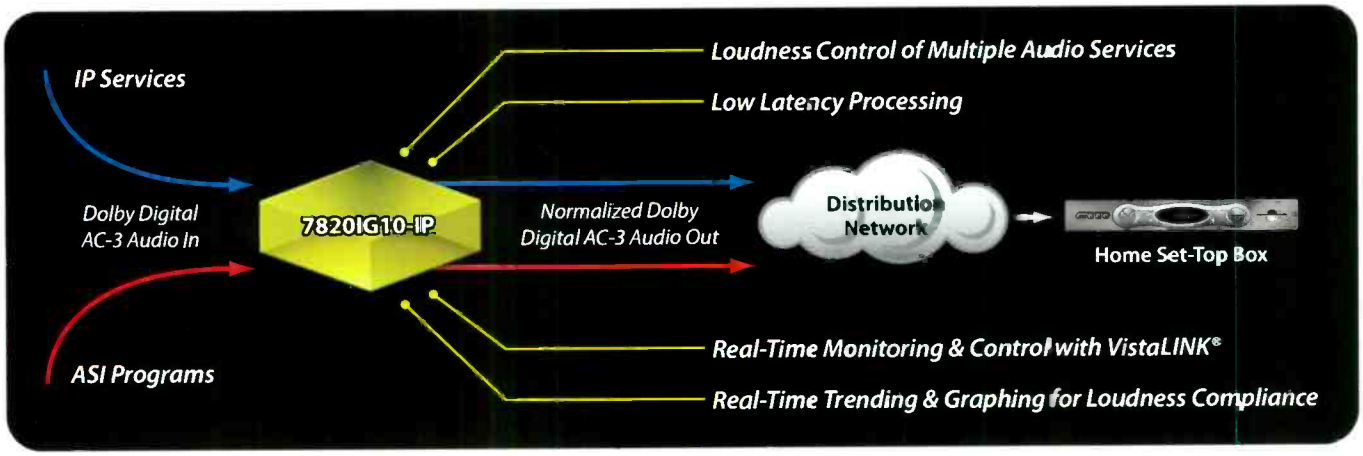

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