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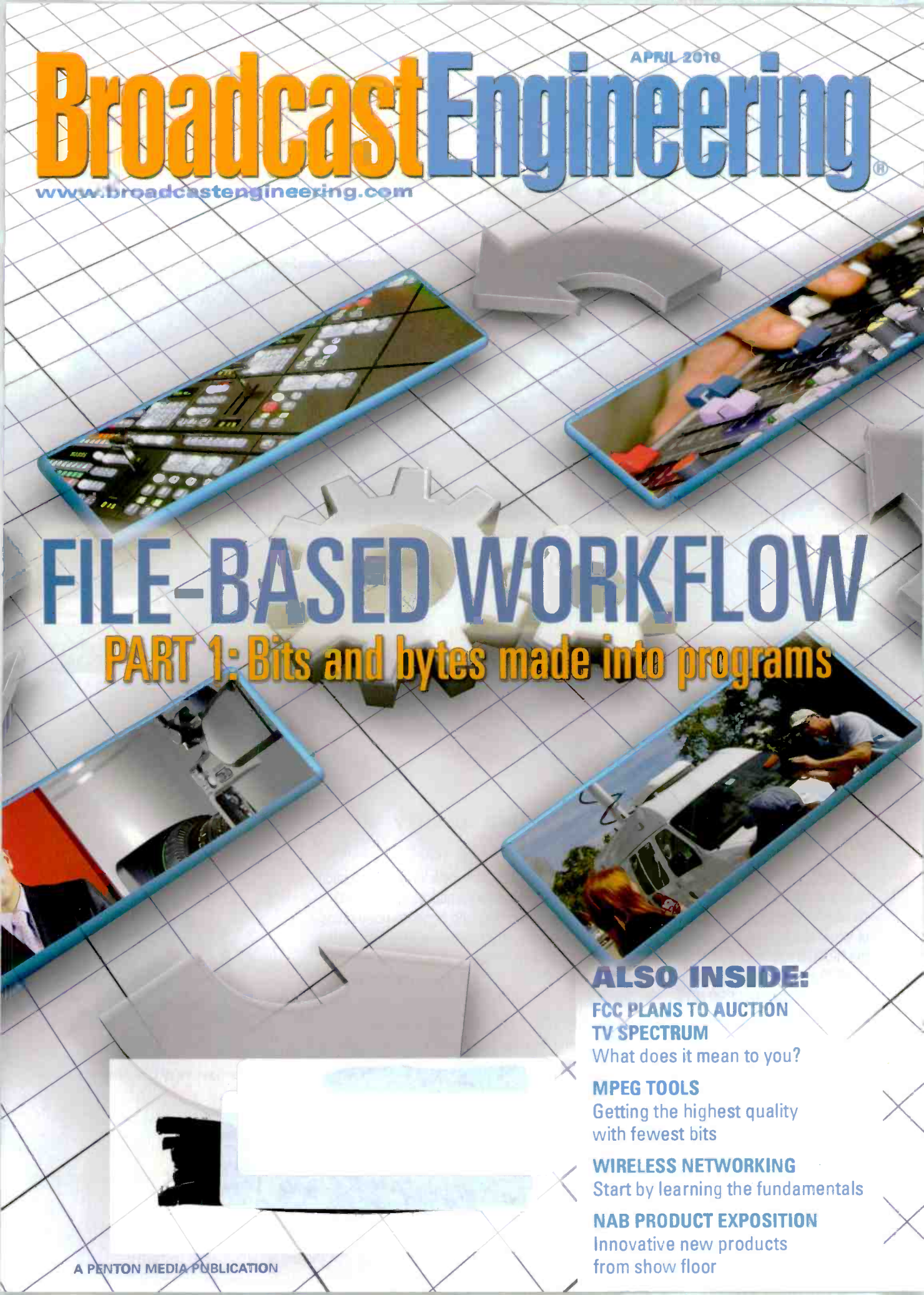

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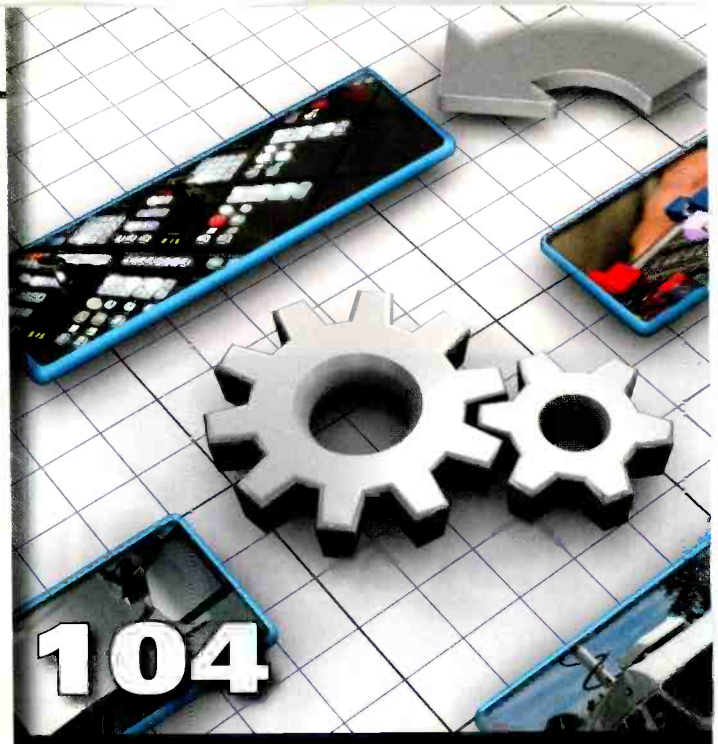

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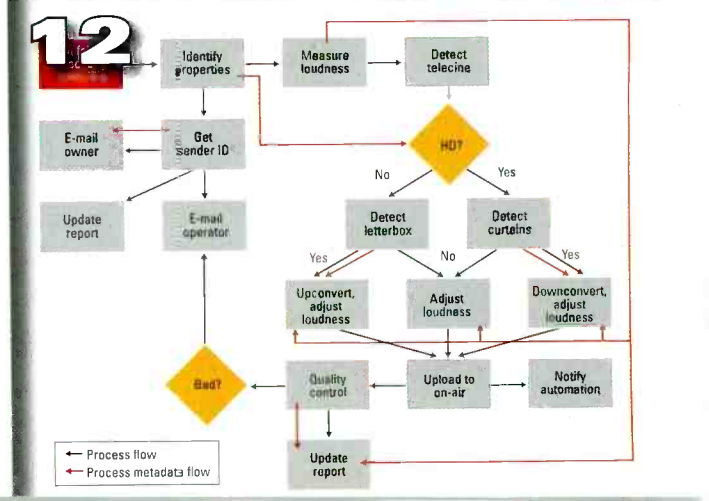

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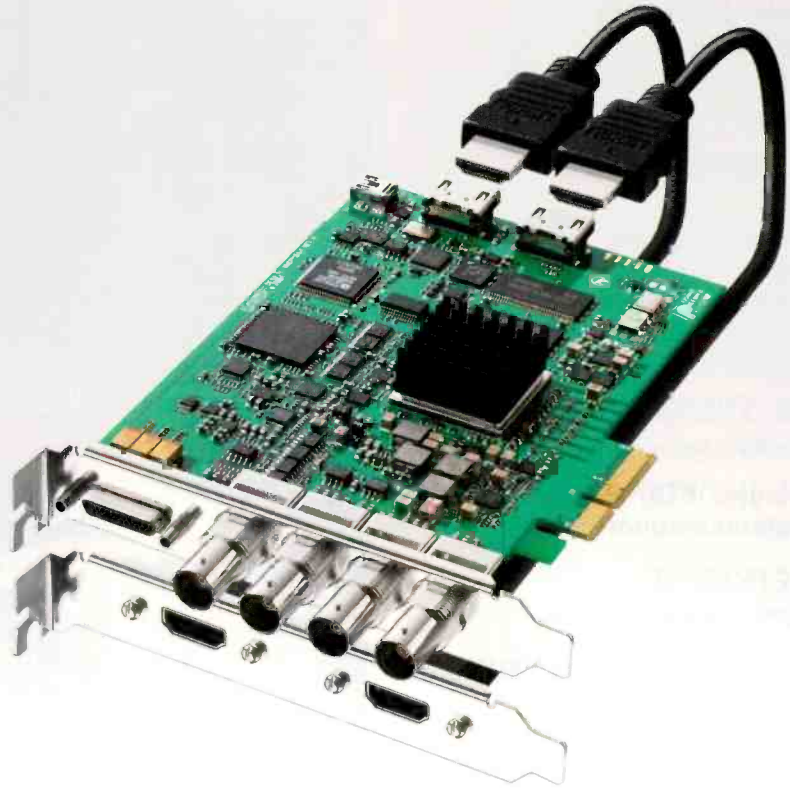

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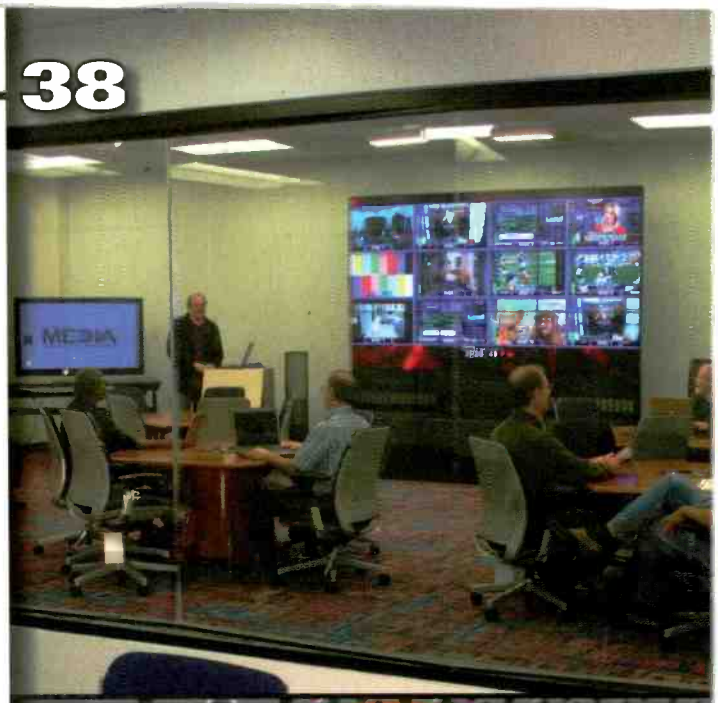

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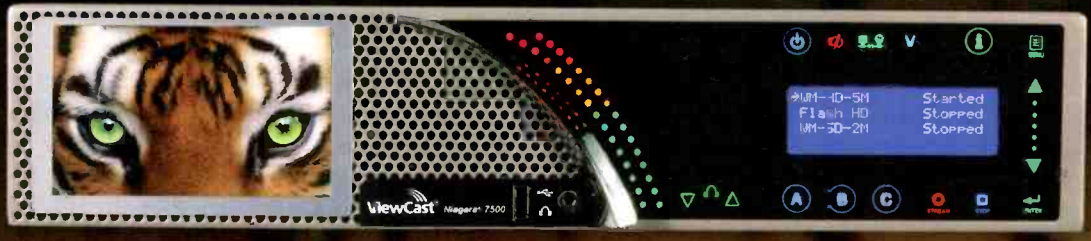

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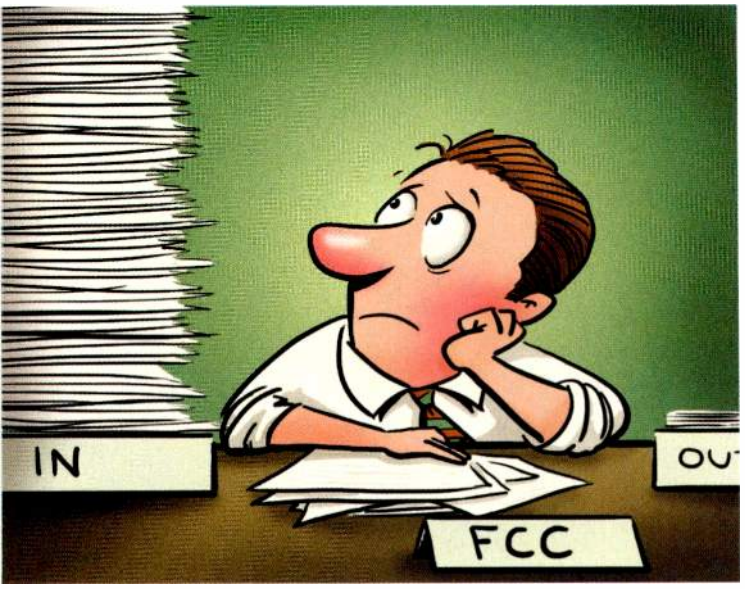
57 million hours of work

According to the Government Accountability Office (GAO), the FCC is dealing with so much paperwork that it requires 57 million "burden hours" just to process it. A burden hour is officially defined in the Paperwork Reduction Act as "the time, effort or financial resources expended by persons to generate, maintain or provide information to a federal agency."

The GAO released its report, "Information Collection and Management at the Federal Communications Commission," in late January. The report notes that in prior studies, the GAO had found weaknesses with the FCC's information collection, management and reporting process.



Readers may recall the political hullabaloo that accompanied the previous chairman's last year in office. One component in the complaints surrounding Chairman Kevin Martin focused on bureaucratic issues, including record keeping, staffing and his style of management. Apparently, things haven't gotten any better.

According to the GAO review, the FCC collects information through 413 collection instruments (forms) or filing mandates. Those filings include required company documents, consumer complaints, company financial and accounting performance, and a variety of other information, such as the annual survey of cable operators. It's worth noting that the numeric total of collection instruments does not include filings and responses made in response to FCC Notices of Inquiry or Notices of Proposed Rule Making. (A table showing how the FCC uses its resources as measured by burden hours is available online.)

The GAO discovered that only 14 of the FCC's 30 information collection portholes are managed electronically. The remainder are handled with old-fashioned paper. The FCC publishes information from 11 of those 30 information collection portholes on its Web site. Some information is published only on request and often in a redacted format.

Other management issues were identified in the GAO's review. The investigators reported that the FCC staff makes what seem like simple operational mistakes. For instance, the agency discovered that the FCC rarely includes the text of a proposed rule in its NOPRs. That's like telling your kid, "I'm changing the rule, and if you break it, you're in big trouble," but then you never say what the "rule" is.

Also, the GAO reported that companies, stations and the public complained that the FCC fails to even clearly specify the information it wants to gather in a public notice. The GAO said the result is that the public is greatly challenged to provide "meaningful input" on proposals and new rule making.

Another indication of the FCC's increasing paperwork is a jump in the number of telecom lawyers. Since the late 1990s, membership in the FCC Bar Association has grown by 73 percent. This occurred at the same time the FCC increased its spending by 37 percent and increased by 300 percent the number of pages of regulations published in the *FCC Record*.

Perhaps the numbers are correct. Maybe it did require 57 million burden hours for the FCC to maintain its current operation. One might ask, then, what's going to happen when Congress gives this monster bureaucracy oversight of a national broadband plan, which proposes, among other things, spectrum auctions, building a new public safety network, a new FCC R&D facility and other empowerments?

Can you spell "FCC lawyer full-employment act"? **BE**

Brad Dick

EDITORIAL DIRECTOR

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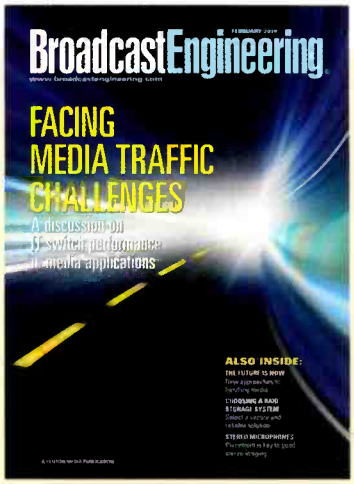

Aspect ratio clarification

Dear editor:

I am writing in response to a letter from Paul in the Feedback department of your February 2010 edition. I have no issue with Paul's personal opinion on aspect ratio and his conclusion in favor of a 4:3 aspect ratio for television. However, I feel that, for the record, some significant errors should be corrected.

• The first error resides with Paul's statement: "My use of the word 'gimmick' is appropriate because it added nothing of real value, only extra background as the real action was still confined to the central 4:3 area."

Nothing could be further from reality, as hundreds of major movies have fully exploited (and still do) the entire widescreen — in highly creative ways — with all sorts of action. Has Paul not heard of the sophisticated "pan and scan" function of the global telecines that transfer film-based movies to TV video, where they must track that action across the wider screens in order to judiciously extract his favorite 4:3 portion?

• The second error is in Paul's statement: "I fail to understand the TV industry fascination with 16:9."

This failure is probably because (a) Paul never participated in any of the standardization working groups back in the 1980s that produced the 16:9 standard for widescreen HDTV and SDTV; nor (b) did he ever study the highly learned research papers that validated the move to a wider screen in the new era of HDTV. This was psychophysical research on large numbers of humans that clearly established a preference for a wider screen. I would suggest that Paul find and read just one of these papers, perhaps starting with "Psychophysical Analysis of the Sensation of Reality Induced by a Visual Wide Field Display" by Hatada, Sakata and Kusaka (*SMPTE Journal*, August 1980).

• The last error is within Paul's statement: "Most paintings from the great masters to modern works are approximately 4:3."

Here, Paul is guilty of a significant inexactitude. I would gently suggest that he return to any major art gallery and take a more careful look.

Larry Thorpe
Canon
Ridgefield Park, NJ

Thinnet networks

Dear Brad Gilmer:

In your February 2010 article on networking hardware, you write:

"While RG-58 was much easier to work with … it required a BNC T and a 50Ω terminator on the back of every card, and you had to shut down the network to install or remove computers from the network."

This is inaccurate. A bus topology thinnet network only requires a total of two 50Ω terminators, one on the BNC T of the first device on the bus, and one on the last device. Devices in the middle do not require termination because they have network cable connected to both legs of the T connector. This is why they are called terminators; they terminate the bus and stop signal reflection from the end of the cable.

Also, it is incorrect to state that the network had to be shut down for nodes to be removed or attached. This is true only if you have to physically disconnect the cable to insert a BNC T connector. Where existing T connectors are in place, nodes can be inserted and removed without any interruption in the network.

And finally, why are the features of the vampire tap and MAU labeled in German?

Jamie Campbell

Brad Gilmer responds:

Well spotted! You are absolutely correct. On 10BASE-T networks, a terminator is required only at the beginning and end of the network. There is a BNC T on the back of every NIC card. The RG-58 cable daisy-chains from one computer to the next via the T connectors. At the ends, a 50Ω terminator is required, as you correctly state, to eliminate reflections.

You are also correct to state that if you have had the foresight to install T connectors where you need computers in the future, then you do not need to shut down the network. Unfortunately, I never was smart enough to figure out six months or a year early where our network would need to be. In this case, the information in the article is correct: You have to break the network to add a computer, something you do not have to do with more modern networks.

In regard to the vampire tap, the picture of the vampire tap has German captions because vampire taps are so old that this is the only picture I could find that illustrated the connections I referred to in the article.

Thanks so much for your helpful comments and the correction regarding the terminators. I hope you find this column useful. BE

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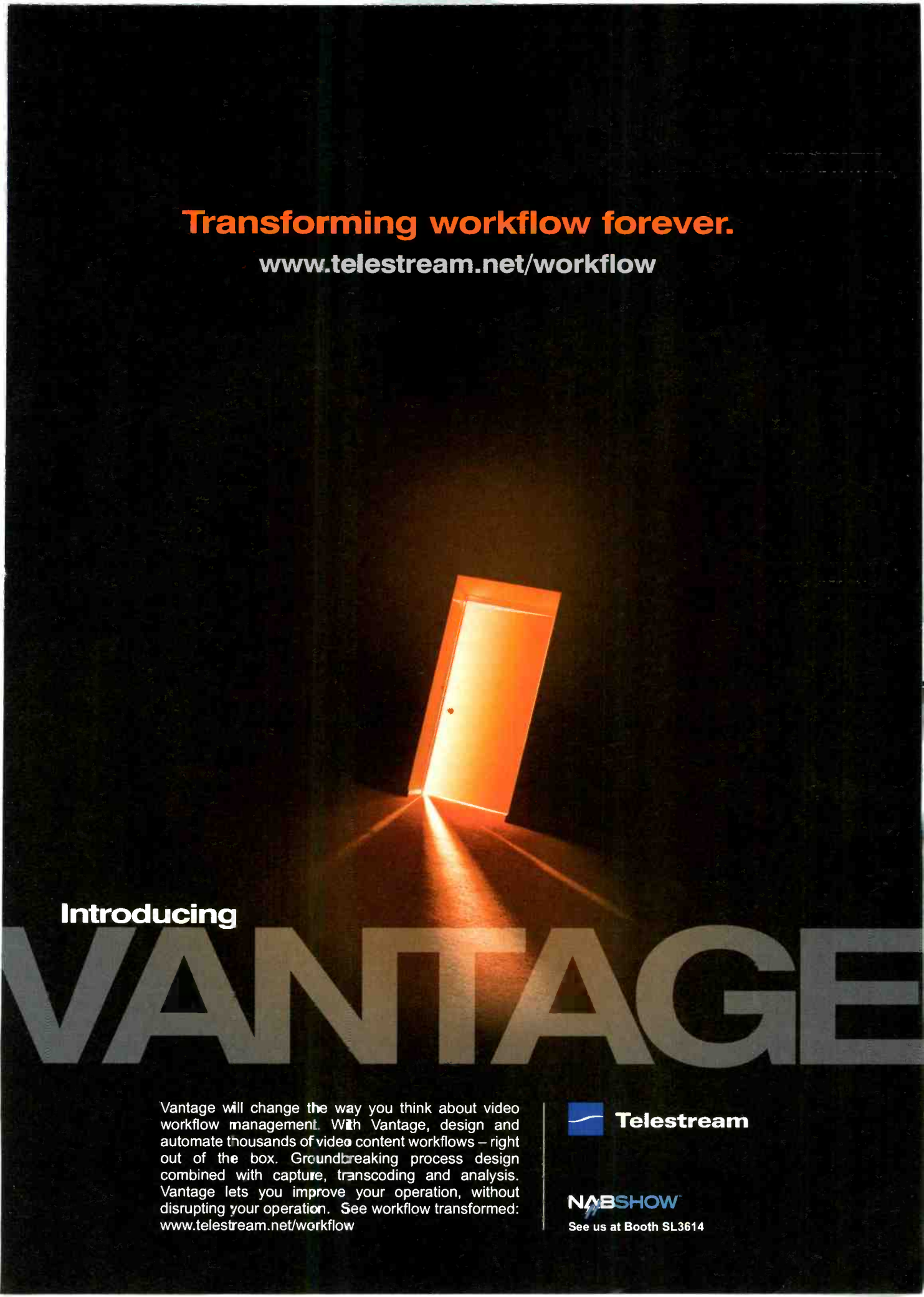

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Guiding video workflow

Video workflow management in an IT-based environment is more than just making data available.

BY JOHN PALLETT

The migration to IT is not unique to the video industry. Hundreds of industries — from automotive manufacturing to financial services to warehousing — have made this transition. Now that almost every device in the video ecosystem supports IT-based data exchange, it is tempting to suggest that the video industry has made that transition as well.

However, there is a difference between making data available and allowing the process design and management necessary to truly leverage IT. When warehouse records moved into the database, it took ERP solutions to build processes around that data before warehousing was able to find true value in IT. While many operational departments within video companies — such as finance, traffic and billing, and sales — already use IT-based solutions to manage both their data and processes, the guts of the video industry have still not truly transitioned to IT.

Specifically, the processes that surround the actual content are still evolving in support for IT-based management and control. Despite the increasing support for IT-based video infrastructure, it is nevertheless a major effort to design, implement, automate and manage video processes. (See Figure 1 on page 14.)

Video operations managers and station engineers must design, implement and manage more video workflows with fewer people.

What type of process is lagging behind? For our purposes, a video workflow is a content-centric process that creates, acquires, modifies or deploys video media assets and supporting metadata. Such processes can be found in news production, spot management, post production, and virtually any other business that creates and manages video.

These video workflows are different from a business-centric or data-centric process, which primarily concerns itself with business rules, and the manipulation of business records in a database. Such business processes may in fact involve media — the business process of creating a report for an advertising client may involve a proxy of last year's spot — but generally the primary goal of such business processes is not the management of the media itself. And in fact, such business processes are well-addressed by IT-based tools such as SOA middleware. So why can't the same be said for video workflows? And who cares?

A lot of people care. The number of IT-based video workflows is on the rise, largely because of two driving forces. First, as revenues from traditional distribution channels decline, content owners and broadcasters are forced to support more distribution channels — often IT-based Web and mobile channels that require new workflows. Second, competitive pressure and the economy have led to cost-reduction and centralization efforts — creating even more need for IT-based workflow automation as headcount is replaced by servers and as redundant work is consolidated at low-cost operations centers. The net result of these forces is that video operations managers and station engineers must design, implement and manage more video workflows with fewer people. And in doing so,

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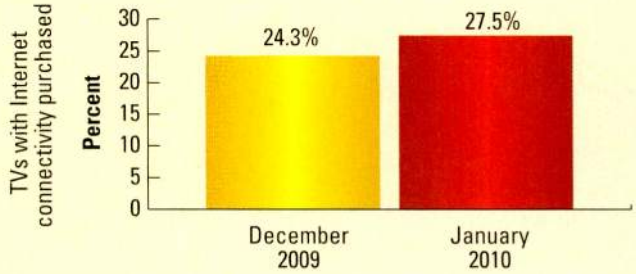

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various approaches to managing those workflows have appeared.

What makes video workflows unique?

To explore the advantages and disadvantages of each approach, it is best to start by looking at some of the unique characteristics of video workflows. What makes video different?

• *Video workflows tend to involve multiple versions of content.* Most video workflows involve numerous versions of some original footage. Content versions may be in different locations, in different file formats, or treated for different formats and different distribution channels. It is not enough to simply create these versions; they must be linked and tracked, and process design must allow the use of different versions at different stages of the course.

• *Video processes tend to change frequently — yearly, monthly, even weekly.* Video operations teams have always been under pressure to be flexible. Whether supporting new distribution channels, new advertising customer requests or changing deadlines, there are always opportunities for process changes.

• *Video processes tend to involve large, metadata-heavy assets and CPU-intensive processing.* Process steps that modify, analyze, capture or play video tend to be fairly CPU- and storage-intensive. As a result, multiserver load-balancing and storage management are often necessary.

• *Video processes tend to involve highly interdependent steps and systems.* Many of the typical steps and systems in a video workflow require more than just a video file. Systems often require advertising information, scheduling instructions, rights permissions and other content metadata before they know what to do.

Further compounding the complexity, another type of metadata — process metadata — is becoming common as individual components become more focused upon their individual task. For example, what use is detecting macro-blocking artifacts if the time code of the error is lost? What value is automatic curtain detection if the curtains cannot be cropped downstream using the result of analysis?

Systems often require advertising information, scheduling instructions, rights permissions and other content metadata before they know what to do.

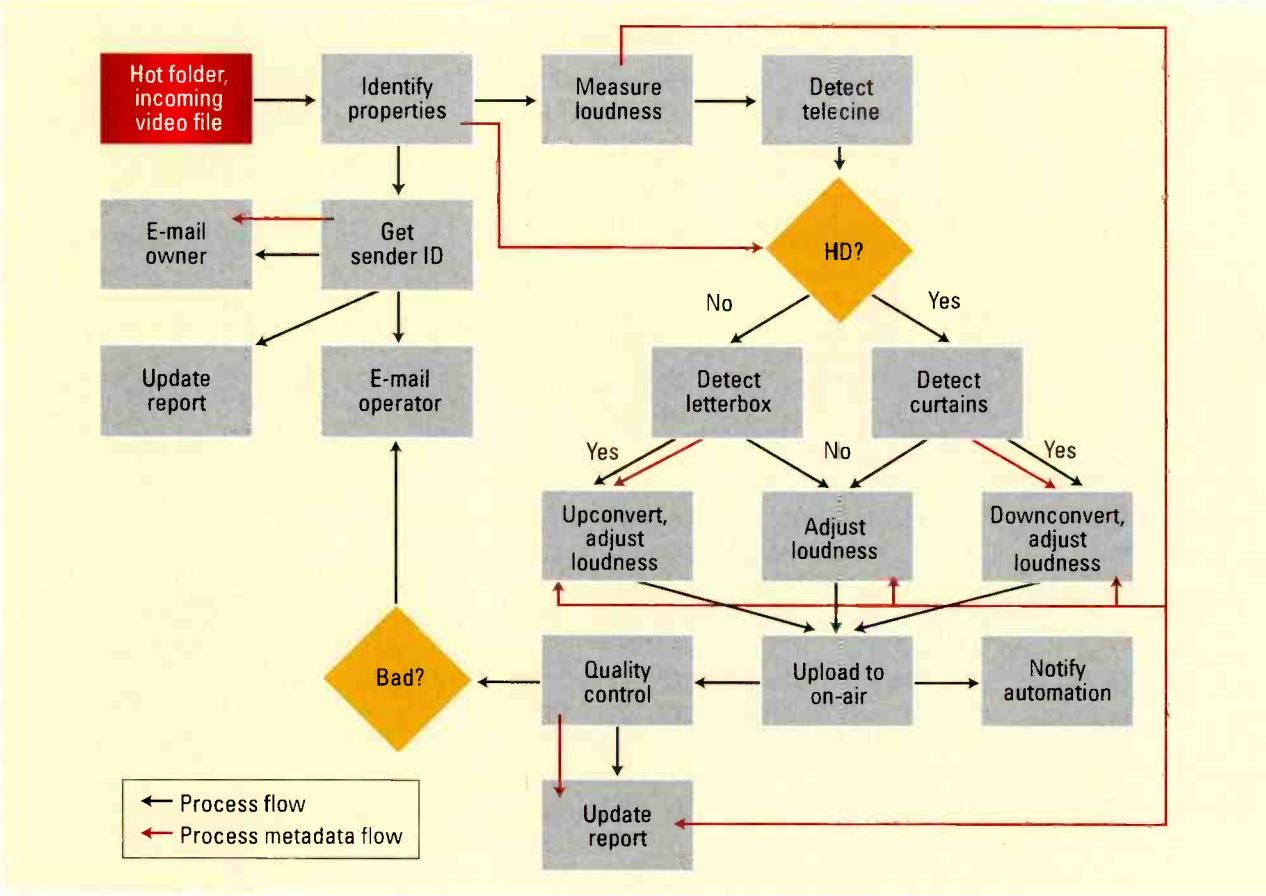

Figure 1. As seen in this real-world example, a video workflow can be quite complex.

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Traditional approaches to managing video workflow

Traditional ways of managing video workflow include:

• *Digital asset management.* Digital asset management (DAM) tools tend to be good at managing large, metadata-heavy assets; they excel at searching and indexing metadata, and at managing storage.

Although DAM systems have added some rudimentary process design tools over the last few years, more sophisticated processes usually involve custom engineering or system integration. DAM systems do not natively preserve video-specific data types in a way that facilitates process design. Finally, DAM systems usually rely upon third-party components to handle 24/7 reliability and load-balancing for mission-critical operations.

• *IT middleware.* Middleware is software that allows the combination of software components to execute processes. There are dozens of generic IT middleware solutions on the market today. The capabilities of middleware vary. Some allow visual process design, some enable integrations with third-party components using SOAP, and others require system integration. In most cases, however, middleware is flexible and does not prescribe a particular operating model.

However, while middleware generally allows process design and management for business processes, they tend to lack core capabilities for managing content-centric processes such as video workflows.

For example, while middleware may allow data exchange between third-party components, it typically does not support data types necessary for video (such as time code), and relies upon underlying components to perform management of multiple content versions and the passing of process-required metadata between steps. They also generally handle load-balancing and 24/7 uptime as needed for the processes that they support, and many of them allow process design "out of the box" at a reasonable price point.

However, such tools often come with the caveat that "You can have any process that you want … as long as it involves transcoding." This ultimately can result in a mandated operational model, which may not be desirable for flexible video workflow design.

Standards-based approach to workflow management

Where systems need to interoperate, standards such as MXF and BXF have been proposed as an interoperability platform. The goal of such standards is typically to provide some degree of information interchange between systems that otherwise could not communicate.

However, neither a file format, nor a protocol specification, can actually perform the work required for interoperability. While MXF and BXF provide a vehicle for vendors to work together, the fully described workflow support within BXF and MXF is narrow and mandates a particular operating model. The reason for this is straightforward: It is up to the participating vendors to actually implement the process, and vendors cannot implement every possible process, nor can standards committees think of every possible use case.

As a result, when the workflow extends beyond the specifics of the standard, attempts are made to extend it. Specific implementations of the standard are proposed, and vendors are convinced to support the implementation, but this very method of implementing the process is the antithesis of flexibility. In the end, the standard works well as a requirements document, but the burden of workflow automation gets shared between participating vendors, and flexibility is difficult to achieve.

When fully funded, software development has several advantages over traditional methods. When done cheaply, software engineering can be precarious.

Successful video workflow management

While the approaches above have various limitations, two more holistic approaches exist that tend to meet the full set of video workflow management requirements:

• *Software development.* A growing number of media companies are building their own process management tools. The result is usually either done well at significant cost or done cheaply in an unreliable fashion.

When fully funded, software development has several advantages over traditional methods. This is particularly true when that software can understand video data types and can arbitrate between partial implementations of standards, removing the burden of interoperability from individual vendors. Such efforts may even be built upon existing middleware and standards, with software developed to fill the gaps as necessary.

When done cheaply, software engineering can be precarious: An IT manager may appear to reduce costs by

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automating a workflow, but if the result is a set of batch scripts on outdated computers, this can be a risky solution for companies where the video workflow is actually the revenue workflow.

• *Video workflow management solutions.* More recently, a new breed of solutions has arrived that are specifically targeted to address the challenge of video workflow management. Such video workflow management solutions tend to be at the intersection of the more traditional solutions. They include aspects of DAM such as storage management, clip management and metadata indexing.

They offer integrated analysis, transcoding and multichannel distribution tools. They may also maintain the flexibility of SOAP-based generic interfaces while actually understanding video data types, with the ability to pass video information between process steps.

Some such solutions are hosted with monthly fees — allowing companies to move their entire video workflow out of the building. This can save on capital expenditure, but not all content owners are comfortable allowing their primary assets to be managed externally.

Some out-of-the-box video workflow management solutions now exist.

Some in-house solutions involve systems integration work to implement the process and tend to be a large-scale proposition. For companies looking for a consultative review of internal processes, this can be an effective approach.

Finally, some out-of-the-box video workflow management solutions now exist. These solutions can offer easy-to-use workflow design and automation — with third-party integration in mind. This allows them to be deployed organically, interacting with existing systems to manage parts of the video workflow on an opportunistic basis.

These systems can scale up to full enterprise-class workflow management solutions, and can generally fit into an existing custom software architecture using Web services interfaces. As a result, these solutions may provide a low-risk, high-potential approach to introducing video workflow management within an organization, without requiring significant investment of time or capital investment. BE

John Pallett is senior product manager for Telestream.

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National broadband plan

The FCC proposes an auction for TV spectrum.

BY HARRY C. MARTIN

In the National Broadband Plan (NBP) released March 16, the FCC proposes a "Mobile Future Auction," which will permit existing spectrum licensees, particularly television broadcasters, to voluntarily relinquish spectrum in exchange for a share of auction proceeds.

According to the NBP, TV spectrum is not being used efficiently and would be better allocated to mobile broadband use. The proposed Mobile Future Auction would be the recommended way to encourage TV licensees to relinquish spectrum in return for at least some of the proceeds when their spectrum is auctioned.

The NBP calls for "freeing up" 500MHz of spectrum over the next decade, with 120MHz to come from broadcast TV. One way the FCC hopes to achieve that is to develop "market-based mechanisms" (i.e., special-feature auctions) that enable spectrum intended for the commercial marketplace to flow to the uses the market values most. Under the FCC plan, broadcasters would not only share in the proceeds of the resulting spectrum auctions, but also their participation in the scheme would be voluntary. How "voluntary" would this be with the FCC controlling the rules of a game where those rules are based on policy goals that cannot be fully achieved absent an end to free, over-the-air TV? It is unlikely broadcasters would volunteer to give up their spectrum without first receiving a guarantee that they would receive at least full value for their stations.

Precisely how such an auction would work has not been determined; indeed, there may be no need to spell out the details at this point. But it is apparent that the commission has thoroughly embraced the notion that television spectrum is a resource that can and should be repurposed for mobile broadband use.

In a February speech, FCC chairman Julius Genachowski said there is a "massive amount of unlocked value" in TV spectrum — maybe even $50 billion, according to "one study," and that "a broad range of analysts, companies and trade associations" have shown the inefficiencies of the current allocation scheme. The study says, "Even in our very largest cities, at most only about 150MHz out of 300MHz [of TV spectrum] are used."

Genachowski said, "the Mobile Future Auction is a win-win proposal: for broadcasters, who win more flexibility to pursue business models to serve their local communities; and for the public, which wins more innovation in mobile broadband services, continued free, over-the-air television, and the benefits of the proceeds of new and substantial auction revenues."

What's next?

Publication of the NBP may not have any immediate or long-term effects on TV spectrum use. The statute requiring the NBP simply directs the FCC to do its due diligence to come up with a plan and then tell Congress about it. The FCC has no independent authority to implement the NBP without formal notice-and-comment rulemaking proceedings. Moreover, the FCC's statutory auction authority does not permit the agency to turn over auction proceeds to incumbent licensees or anyone else but the U.S. Treasury.

Also, members of Congress may be reluctant to let the FCC raid TV spectrum, particularly if broadcasters increase the introduction of multichannel video and data services on their own. Another key factor is, of course, the considerable political clout TV broadcasters have in their home markets in an election year. BE

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

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

Dateline

- Noncommercial TV stations in Arizona; Idaho; Maryland; New Mexico; Nevada; Utah; Virginia; Washington, D.C.; West Virginia; and Wyoming must file their biennial ownership reports by June 1. The biennial ownership reporting date for commercial TV, Class A TV and LPTV stations has been suspended pending a further redesign of FCC Form 323.

- June 1 is the deadline for TV stations in Arizona, Idaho, New Mexico, Nevada, Utah and Wyoming to electronically file their broadcast EEO midterm reports (Form 397) with the FCC.

- June 1 is the deadline for TV stations licensed in the following states to place their annual EEO reports in their public files: Arizona; Idaho; Maryland; Michigan; New Mexico; Nevada; Ohio; Utah; Virginia; Washington, D.C.; West Virginia; and Wyoming.

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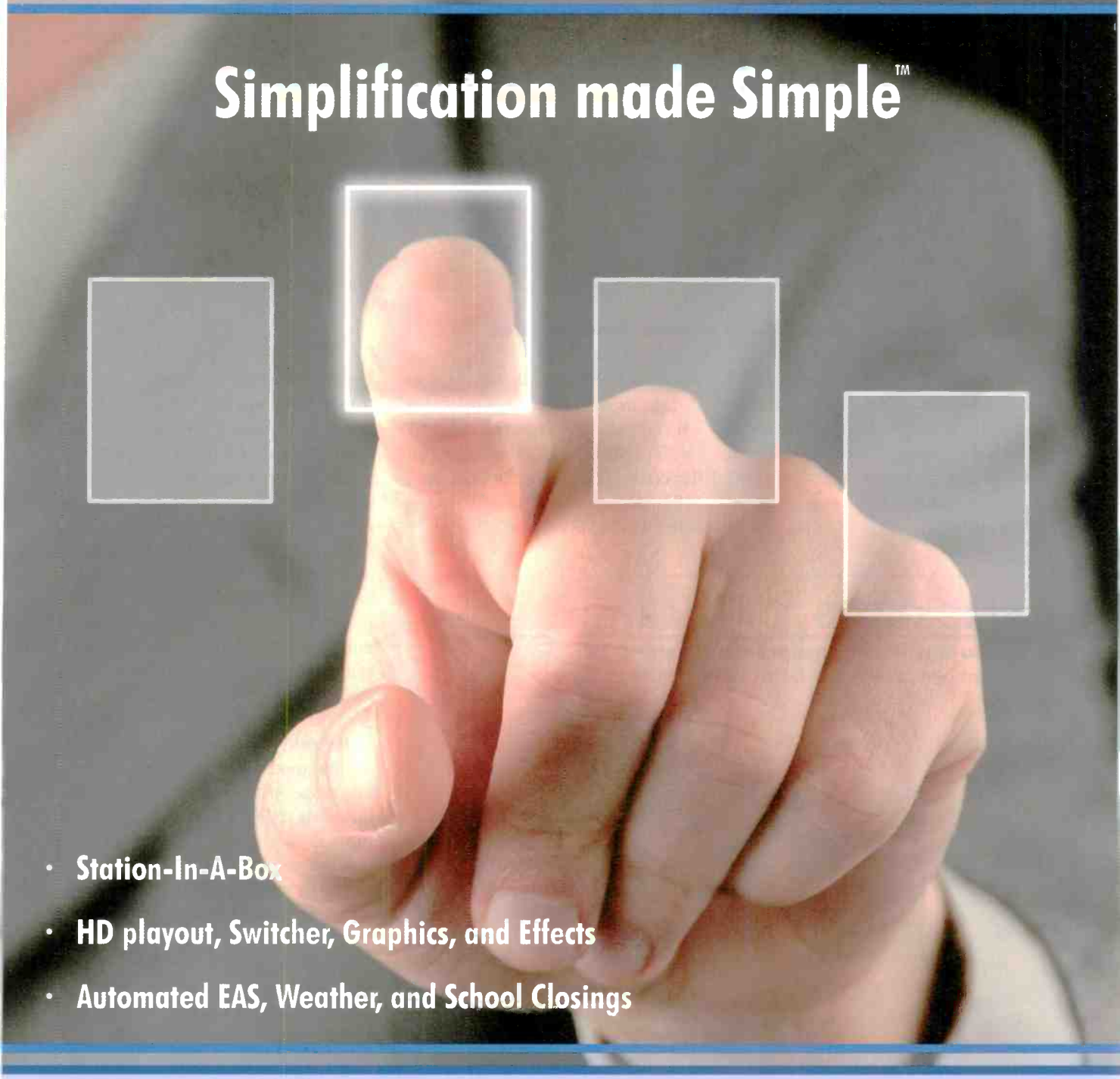

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MPEG tools

Bandwidth and cost are driving innovation.

BY ALDO CUGNINI

Video compression has been available in a standardized form for about 20 years. Over that time, there have been considerable advances in the technology. To get a better appreciation of how it will continue to evolve, it's useful to look at how it has developed so far. While there are several video compression systems in use today, some of them proprietary, the progress made by the MPEG working group forms a good basis for this analysis.

A look back

Work on MPEG-1 video and audio was started in 1988, with the first standards being released in the early 1990s. The system was designed to operate at compressed bit rates of up to about 1.5Mb/s and was primarily aimed at delivering digital video on storage media such as compact disc. One typical use was on the video CD (VCD). MPEG-1 also specifies audio coding, including the ubiquitous MP3 format (so-called because it is defined in MPEG-1 Layer III).

MPEG-1 described a standard method for defining picture types and groups of pictures, called intra, predictive and bipredictive. It broke the pictures down into slices of macroblocks, which are further divided into constituent blocks. These blocks then undergo transform coding, which converts the spatial video information into frequency information that can then be perceptually compressed by means of quantization. Interpicture redundancy is then removed by means of residuals (differences between pictures) and motion vectors (which predict the motion of objects between macroblocks). Finally, entropy coding is used to reduce the transmitted information by exploiting the statistical redundancy in the generated code words. (See Figure 1.)

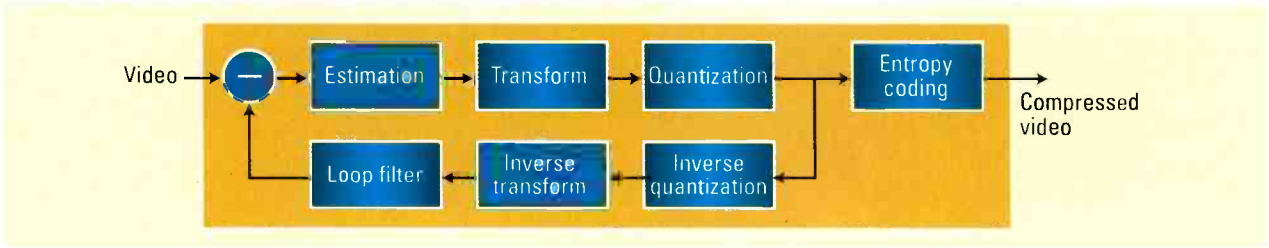
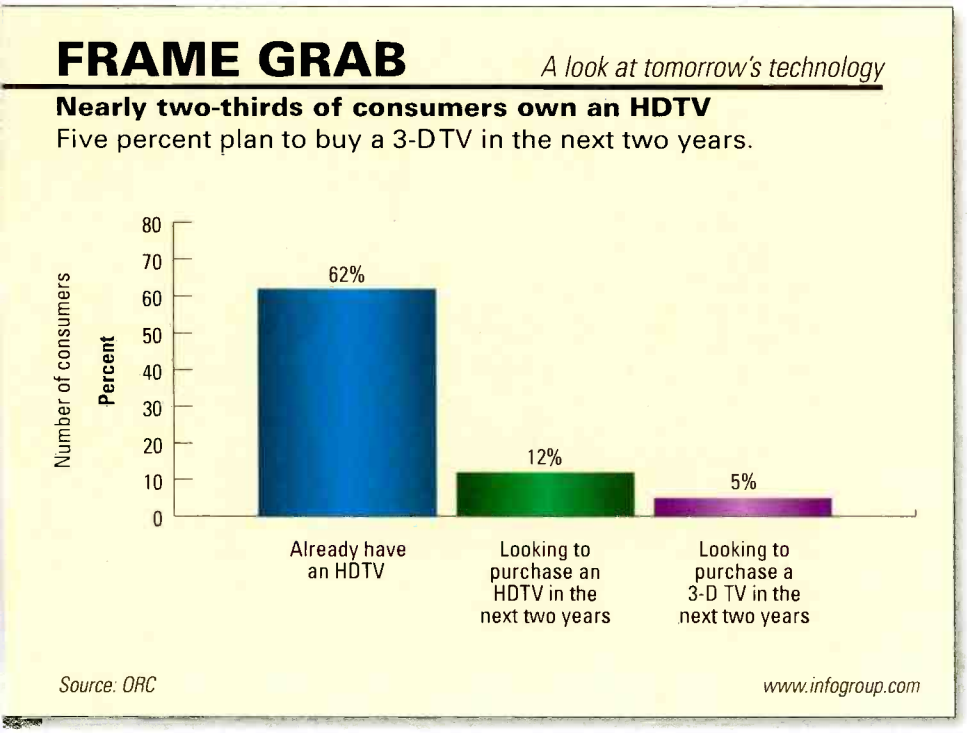


Figure 1. Video compression is based on a number of elementary steps.

MPEG-2, which was introduced in the mid-'90s, went further by allowing good video quality at higher bit rates, with higher resolutions, including HDTV, as well as an optimized mechanism to support interlaced video. (HDTV support was originally envisioned for an MPEG-3 standard; that effort was soon rolled into MPEG-2, when it was found that the HD resolutions could be easily supported therein.) MPEG-2 also introduced the concept of the transport stream, which allowed for simultaneous multiple program streams, each with its own synchronization information. The target then became



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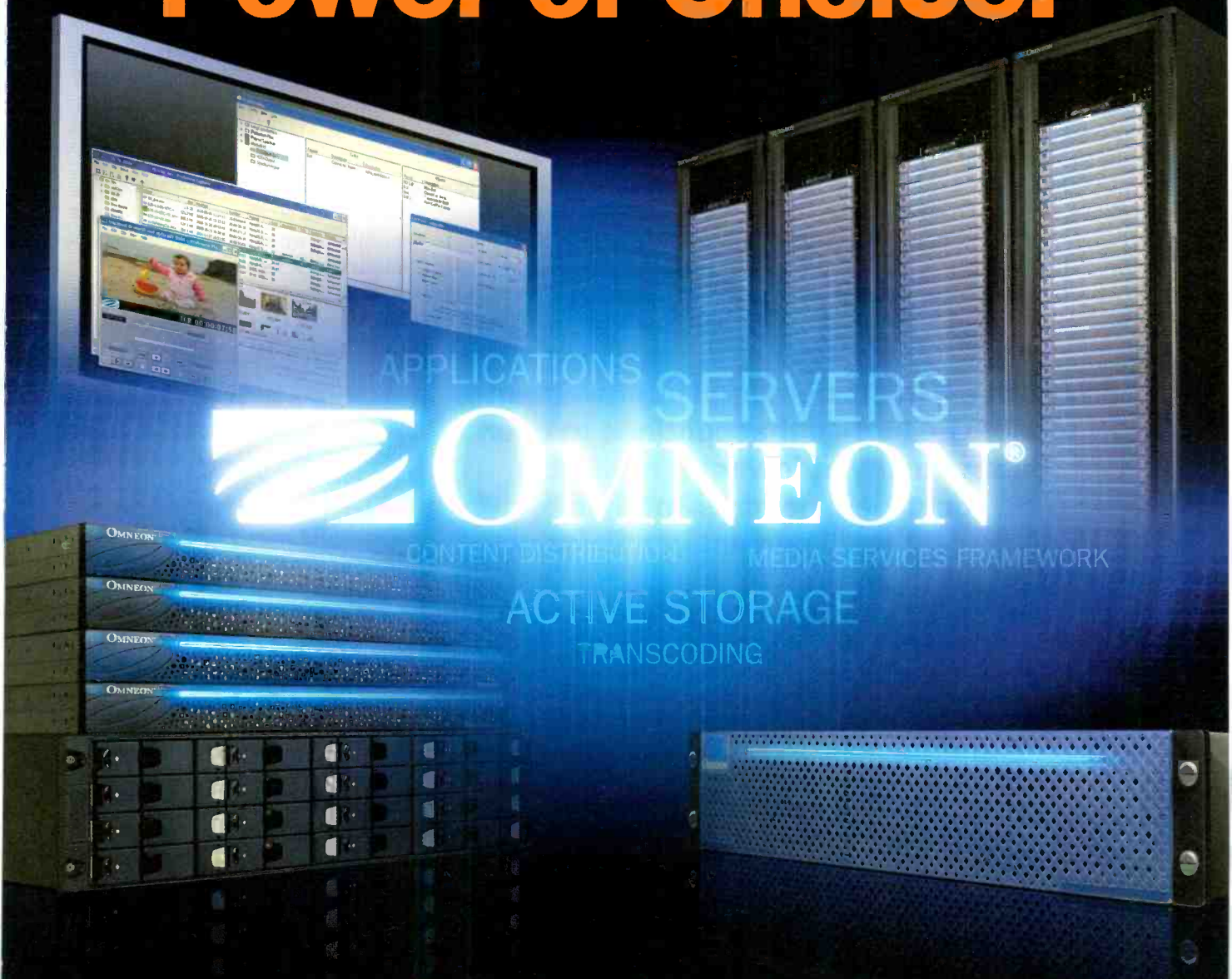

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transmission and broadcast systems, which are inherently one-way, and therefore need a fault-tolerant synchronization process. In addition, the adoption of MPEG-2 for DVDs provided the quality and convenience needed to quickly establish the medium as a popular consumer format.

The growing need for more bandwidth efficiency drove working groups to develop MPEG-4 in the late '90s. By adding the concepts of video objects and video object planes, MPEG-4 coding allows a foreground video object plane to be coded over a separately coded background image, in contrast to coding an entire picture. The technique also introduced methods for coding still textures and synthetic images. A still-growing application of MPEG-4 at low bit rates is for 3G/4G mobile-phone video.

We can expect incremental improvements to MPEG-4 Part-10 that continue to offer better quality at lower bit rates; this could yield perhaps another 10 percent to 15 percent in efficiency.

While a target of lower bit rates initially drove the development of MPEG-4, new techniques developed into the early 2000s enabled the improved coding of video at higher bit rates as well. This led to the development of MPEG-4 Part 10, a.k.a. AVC, for Advanced Video Coding (equivalent to H.264), which enabled about a 50-percent improvement in coding efficiency for even HDTV video. AVC support is now required for all Blu-ray disc players and is suitable for use in various transmission systems, including extensions to DVB-T and ATSC, as well as for IPTV.

AVC provides a much-enhanced toolkit over its predecessors; some of the key features include picture-adaptive frame/field coding, intra estimation (within blocks), 4 x 4 transform blocks, lossless macroblock coding, macroblock adaptive field-frame coding, 4 x 4 (and other size) motion compensation blocks, quarter-pel motion vector precision, multiple-reference P- and B-frames, de-blocking filters, various entropy coding algorithms and Fidelity Range Extension. These features enable better video quality at lower bit rates and reduce the visibility of artifacts; different implementations can also offer lower delay, lower decoder processor load and better error resilience. Higher supported resolutions also include those for digital cinema.

MPEG-4 Part 10 offers various levels of scalability, using Scalable Video Coding (SVC), so that simpler receivers decode only the elements needed for that level of performance. SVC has been incorporated into the new ATSC M/H mobile TV standard, allowing for simultaneous coding of different resolutions and frame rates.

MPEG-4 also defined an advanced audio coding (AAC) standard (based on a likewise-named portion of an earlier MPEG-2 specification), which has since come to be used in the Apple iPod and various video game systems. The "high-efficiency" AAC codec also has been incorporated into various transmission systems, such as ATSC M/H and DVB-H.

Where is compression going?

The MPEG working groups continue to refine aspects of the MPEG-4 standard. In 2008, an extension to AVC was released, called Multiview Video Coding (MVC), which enables the simultaneous coding of different views of the same scene. This allows for a standard method of coding 3-D video, which has since been adopted for use on Blu-ray discs. MPEG-4/MVC compresses both left- and right-eye views and can provide full 1080p-resolution backward-compatibility with 2-D decoders. It works by exploiting the similarities between multiple-camera video captures of a scene. By eliminating redundant information across camera views, MVC achieves a reduction in bit rate of approximately 20 percent to 25 percent on average, when compared to encoding each view separately.

Work also has been started on the feasibility of High-performance Video Coding (HVC), which is mainly intended for high-quality applications. The goals of the project include performance improvements at higher resolutions, such as for home cinema and ultra-HDTV (U-HDTV); the benefits include lower noise level, extended color gamut and higher dynamic range. The work will generally involve the modification (extension and refinement) of existing coding tools.

What's next? While there is no "MPEG-5" in the works, we can expect incremental improvements to MPEG-4 Part-10 — perhaps a few more coding tools — that continue to offer better quality at lower bit rates; this could yield perhaps another 10 percent to 15 percent in efficiency. In addition, encoding techniques, while constrained to generating compatible compressed video, can improve the quality/bit rate efficiency through novel search techniques and distortion optimization. Expect about a 5-percent to 10-percent improvement. There is no limit to technological ingenuity, especially when bandwidth and cost are driving innovation. BE

Aldo Cugnini is a consultant in the digital television industry.

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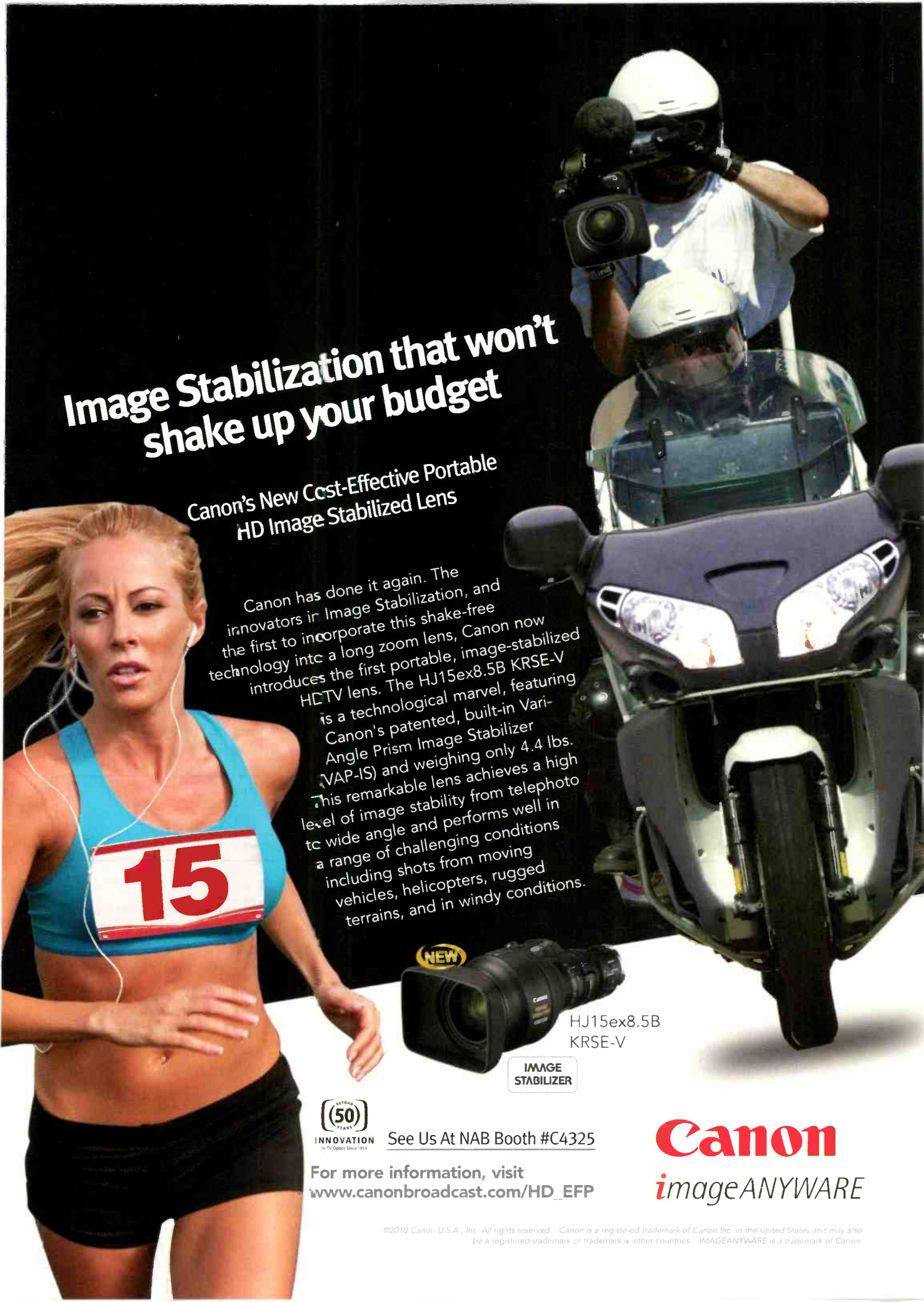

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Wireless networking

Here are the fundamentals every broadcaster should know about wireless networks.

BY BRAD GILMER

The standard for wireless networking, written and maintained by the IEEE, is 802.11. The document has been expanded over the years, and the two most heavily used sections are 802.11b and 802.11g. Both versions use the same spectrum centered on 2.4GHz. While there are a number of differences between the b and g versions of 802.11, the most important thing to know is that 802.11b has a maximum data rate of 11Mb/s, and 802.11g has a maximum data rate of 54Mb/s. But as with most networking technology, you will never see those maximum data rates. You should expect more in the neighborhood of 6Mb/s from b technology and around 20Mb/s from g technology.

The IEEE just published 802.11n in October of 2009. The 802.11n standard supports a maximum data rate of 600Mb/s and adds a new band of frequencies in the 5GHz range. For a host of reasons, maximum data rates in the range of 120Mb/s to 150Mb/s are more realistic.

A lot of effort was put into making g backward-compatible with b, and you can see this in the fact that both of these systems use the same frequency channel arrangement, and both of them use spread spectrum modulation techniques. Unfortunately, they also share a problem, which used to be an issue when you mixed a 10Base-T device into a 100Base-T wired network — namely that adding a b device to a g system can slow down the entire wireless network. The same issue exists with n networks.

All of these standards use adaptive data rates, meaning that they can slow the link data rate if the RF link becomes noisy. For example, a g device may support data rates of 54Mb/s, 36Mb/s, 24Mb/s, 18Mb/s, 11Mb/s, 5.5Mb/s, 2Mb/s and 1Mb/s. (The last four rates — 11, 5.5, 2 and 1 — are b rates.) If you are using a wireless device in a marginal service area, the device may drop back from 54Mb/s to 1Mb/s if the signal becomes weak. (Remember that these are maximum rates. Your actual throughput will be less than 50 percent of these values.)

The IEEE just published 802.11n in October of 2009. It supports a maximum data rate of 600Mb/s and adds a new band of frequencies to the 5GHz range.

How wireless works

Enough about the generalities; how does wireless work?

For this discussion, let us assume you have a producer who has just plopped herself down on a comfy couch in your post-production suite. She pulls out her laptop to connect to your open client wireless network to pull up the storyboard for this session from a server on the Internet. (By open client, I mean you have an open wireless network in your post room that producers can use to access the Internet. Users do not have to use security or enter a password to use the wireless connection.)

You have an access point (AP) in your post area, which broadcasts its service set identifier (SSID), POST_NET, on a regular basis. After a few moments, the producer's computer finds the POST_NET access point and displays its availability on her screen. She chooses to connect to the AP, and after a few moments, her computer is authenticated by the AP, associates with this AP and finally gets an IP address on the network. But what is going on behind the scenes?

As the packet capture in Figure 1 shows, about once every one-tenth of a second, the POST_NET AP sends out a beacon frame. Each beacon frame contains the name of the AP along with information about its capabilities, such as supported data rates, security modes and so on.

Once the producer has indicated that she wants to connect to POST_NET, the first step is for her laptop to be authenticated with the POST_NET AP. In open system

```
114   11.673681 Cisco_41:bd:6e   Broadcast   IEEE 802.11  Beacon frame, SSID="POST_NET"
115   11.776078 Cisco_41:bd:6e   Broadcast   IEEE 802.11  Beacon frame, SSID="POST_NET"
116   11.878489 Cisco_41:bd:6e   Broadcast   IEEE 802.11  Beacon frame, SSID="POST_NET"
117   11.980877 Cisco_41:bd:6e   Broadcast   IEEE 802.11  Beacon frame, SSID="POST_NET"
118   12.083280 Cisco_41:bd:6e   Broadcast   IEEE 802.11  Beacon frame, SSID="POST_NET"
```

Figure 1. Beacon frames announce the availability of an access point.

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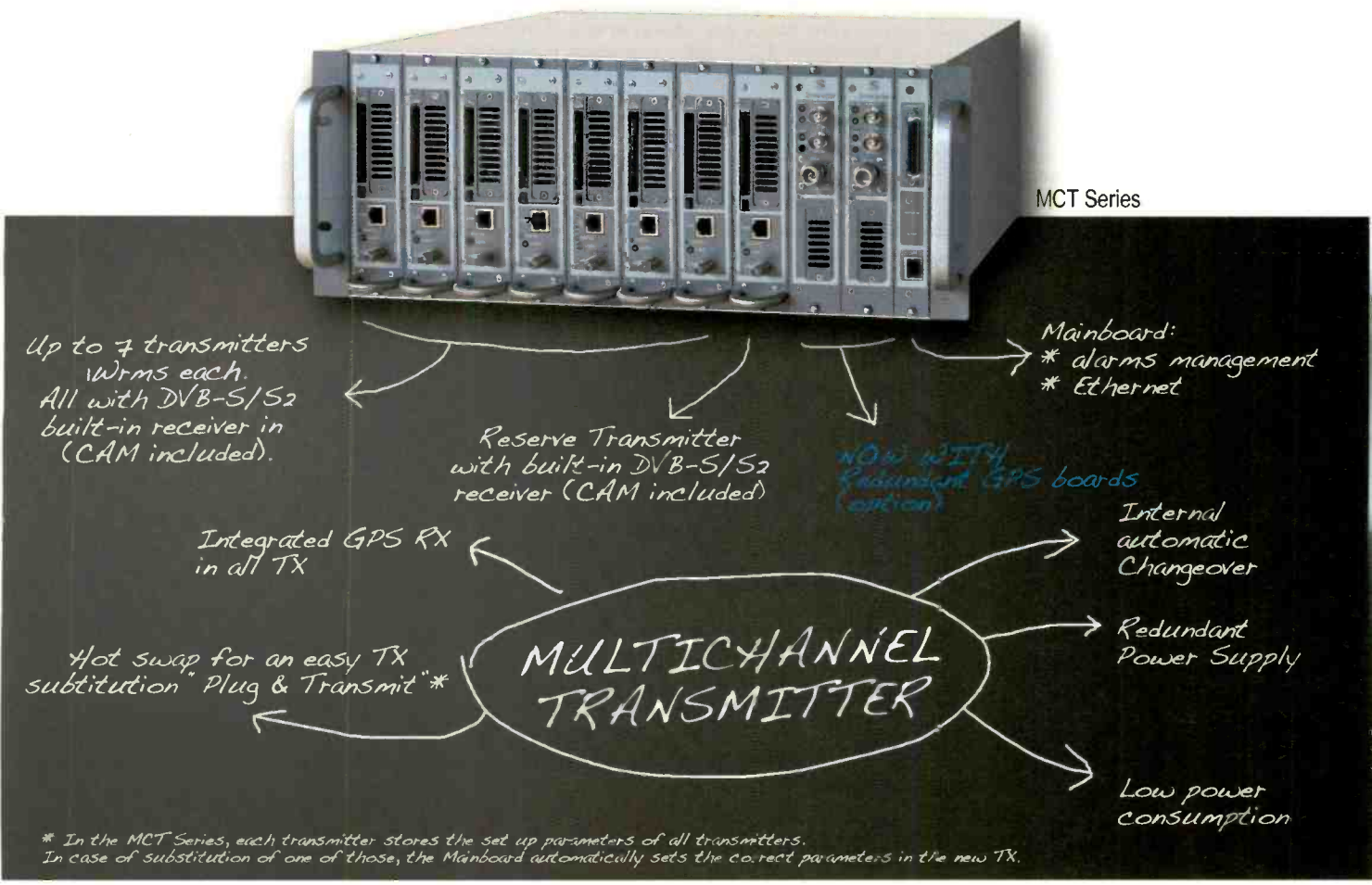

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authentication, the authentication process is guaranteed to succeed. The two systems exchange capability information, the laptop asks to be authenticated using the open system authentication algorithm, and the AP returns a message saying the authentication was successful. There are many different authentication methods available. The most common are Open, Wired Equivalent Privacy (WEP) and Wi-Fi Protected Access-Pre-Shared Keys (WPA-PSK). Open networks can be accessed by anyone. WEP security is simple to use but should not be relied upon; it can be easily cracked. WPA-PSK is more secure.

Once the laptop has been authenticated with the AP, the next step is for the laptop to become associated with

```
Frame 719 (79 bytes on wire, 79 bytes captured)
IEEE 802.11 Association Request, Flags: ........
    Type/Subtype: Association Request (0x00)
    Frame Control: 0x0000 (Normal)
    Duration: 258
    Destination address: Cisco_41:bd:6e (00:01:e3:41:bd:6e)
    Source address: Dell_3d:aa:57 (00:16:bc:3d:aa:57)
    BSS Id: Cisco_41:bd:6e (00:01:e3:41:bd:6e)
    Fragment number: 0
    Sequence number: 14
IEEE 802.11 wireless LAN management frame
    Fixed parameters (4 bytes)
        Capability Information: 0x0411
            .... .... .... ...1 = ESS capabilities: Transmitter is an AP
            .... .... .... ..0. = IBSS status: Transmitter belongs to a BSS
            .... ..0. .... 00.. = CFP participation capabilities: No point coordinator at AP (0x0000)
            .... .... ...1 .... = Privacy: AP/STA can support WEP
            .... .... ..0. .... = Short Preamble: Short preamble not allowed
            .... .... .0.. .... = PBCC: PBCC modulation not allowed
            .... .... 0... .... = Channel Agility: Channel agility not in use
            .... ...0 .... .... = Spectrum Management: dot11SpectrumManagementRequired FALSE
            .... .1.. .... .... = Short Slot Time: Short slot time in use
            .... 0... .... .... = Automatic Power Save Delivery: apsd not implemented
            ..0. .... .... .... = DSSS-OFDM: DSSS-OFDM modulation not allowed
            .0.. .... .... .... = Delayed Block Ack: delayed block ack not implemented
            0... .... .... .... = Immediate Block Ack: immediate block ack not implemented
        Listen Interval: 0x000a
    Tagged parameters (51 bytes)
        SSID parameter set: "POST_NET"
        Supported Rates: 1.0(B) 2.0(B) 5.5(B) 11.0(B) 18.0 24.0 36.0 54.0
        Extended Supported Rates: 6.0 9.0 12.0 48.0
        Vendor Specific: WPA
```

Figure 2. An association request contains information on the capabilities of the wireless client. The access point then decides to approve or reject the association request based upon this information, along with other policies established by the network administrator.

POST_NET. As Figure 2 shows, the laptop sends an association request to the AP. The request includes information about the capabilities of the laptop, including data rates, security modes available, RF radio capabilities and so on. Note that in this figure, the laptop supports data rates up to 56Mb/s and also supports WPA-PSK authentication.

The AP then either accepts or rejects the authentication request. It is important to note that the AP may reject the request for reasons outside the control of the client laptop. For example, the AP may be configured for load sharing and may reject the request because it is more heavily loaded than other APs in the post-production area.

Once the authentication is accepted by the AP, the final step in the process is for the laptop to request and receive an IP address on the wireless network. This IP address is assigned by the Dynamic Host Configuration Protocol (DHCP) server on the network and might not be assigned by the AP itself.

Common problems

If you have worked at all with wireless networks, you know that they may work one minute and not work the next. Or, you may walk into a conference room, connect to a wireless network but then be unable to do anything else. In the brief space remaining, let me give you a few things to check if the wireless network is not working properly:

- If you are unable to initially connect to a wireless network, identify where the problem lies. You now know that there are at least three steps to connecting to a wireless network. Are you able to find the right network? Do you get a message saying that you are associated with the network? Are you able to authenticate with the network? Did you get an IP address on the network? Knowing the answer to these questions can help in your troubleshooting efforts.
- Some networks require you to launch a Web browser and pay a fee, even if the APs are open. In other words, you may be able to get all the way through the process described above, but you may not be able to access the Internet until you pay for it.
- If you are getting kicked off the wireless connection after you successfully connected, the problem could be interference in the 2.4GHz band. The issue might be a weak signal, or if the AP is also combined with a router, the problem might be that the wireless router cannot handle the amount of traffic flowing through the system. But be aware that it could also be that a hacker keeps knocking you off the network.
- If you are able to connect to the wireless network but cannot get an IP address, the problem might be that the DHCP server is out of IP addresses. DHCP servers have a limited number of IP addresses in the DHCP pool. If the pool becomes exhausted, you will not be able to obtain an IP address, and therefore you will not be able to access the network.

As a broadcast engineer, you will likely find yourself having to troubleshoot wireless networks. Understanding how they work will give you one more tool in your IT toolbox. BE

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

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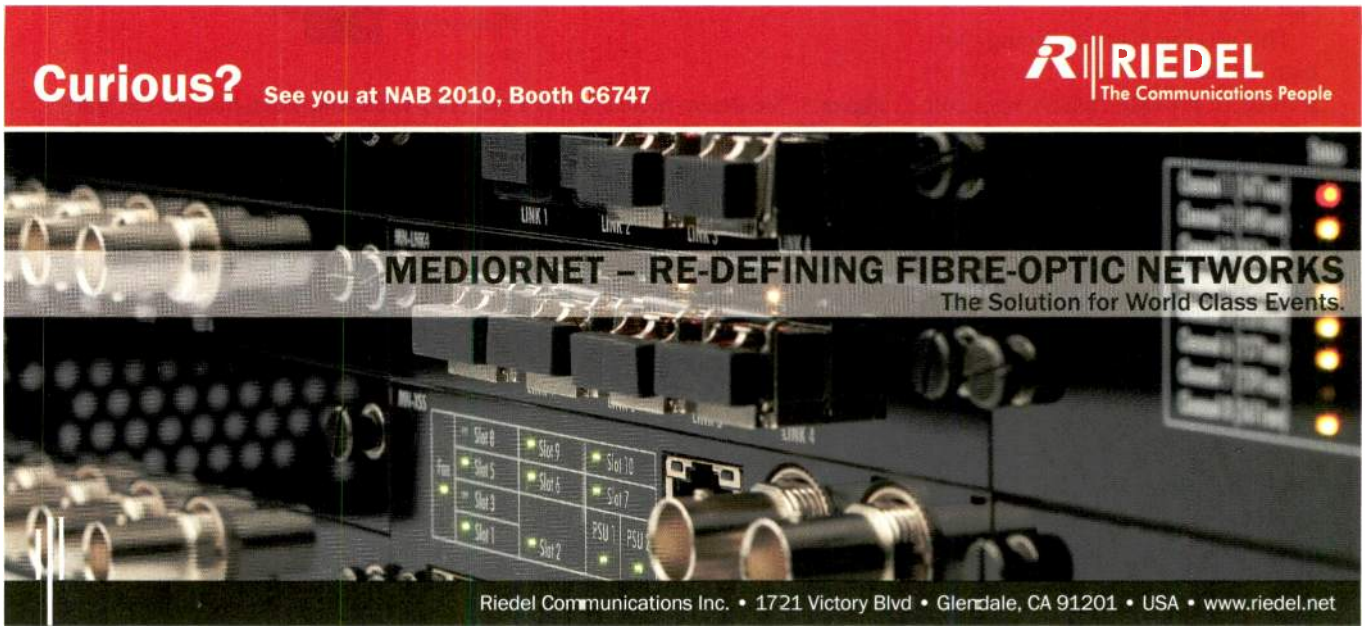

Olympic coverage

A Canadian broadcaster makes use of cellular networks.

BY PHIL KURZ

Originating Olympic coverage always encourages pushing the technology envelope, but not enough to risk the shot. So while new technologies are often tried, such trials may actually be larger implementations of trusted systems. That wasn't the case with one aspect of this year's Winter Olympics broadcasts in Canada.

Mobile coverage

One of the toughest things for broadcasters to cover is a moving event. One familiar mobile event is the marathon. Here, the length is 26.2mi. Sure, you could use a helicopter, but that is an extremely expensive platform, and there's no possibility of a first-person look at the runners from 2000ft.

A typical solution is the motorcycle. Here, a driver and camera person move in tandem with the runners. One benefit is the opportunity for excellent close-ups. The key to success is a reliable RF relay system as the camera moves throughout the marathon path. Such solutions can be expensive and complex.

This was the dilemma facing Canadian broadcaster CTV. The network wanted to provide viewers with continuous live coverage of torch carriers as they ran through 1000 Canadian communities to the site of the Olympic Games in Vancouver. The problem was now to remain close enough to the runners to get good images all the while doing so over a multimile course.

The broadcaster's solution was supplied by a startup company called Dejero from Waterloo, Canada. With Dejero's portable broadcast platform, CTV was able to provide live and online broadcasts of up to 10 hours per day for 86 of the 106 days of the torch relay. The system works with existing cell phone service; Wi-Fi connections; satellite data services, such as Inmarsat's BGAN network; or next-generation wireless links, such as WiMAX and HSPA+ networks.

The system identifies available cell phone bandwidth, encodes the video to that bit rate and distributes outgoing video data across multiple cell phone connections to deliver a live online and on-air signal. (See Figure 1.) It combines off-the-shelf components with proprietary software to manage data throughput and match it to available wireless channels.

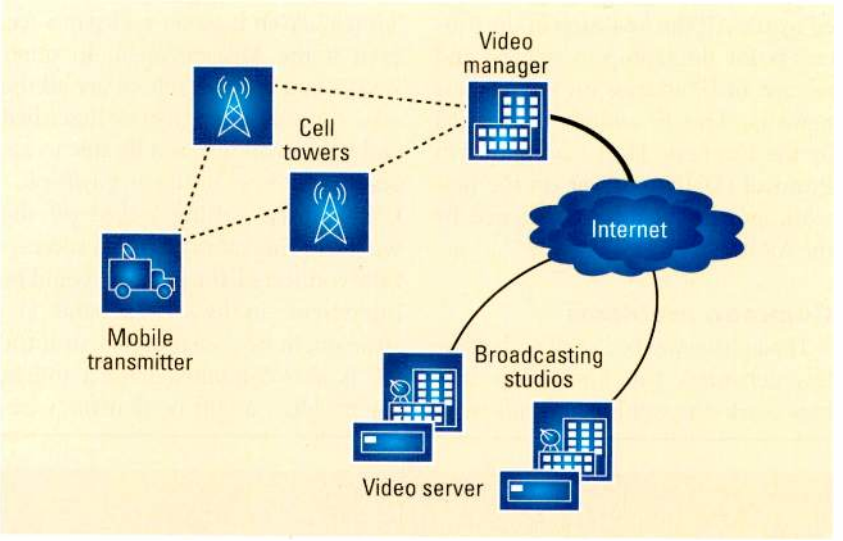

Figure 1. The Dejero mobile system can relay wideband video back to the studio via multiple cell phone carriers and then reassemble the signal as required at the receive points.

"The system is smart enough to figure out available bandwidth based on the environment it is in," says company CTO Bogdan Frusina. Upon startup, the company's ENG platform scans available wireless connections and sets a target bit rate for its MPEG-4 H.264 encoder based on available bandwidth. In a newsgathering environment, the device typically uses 2Mb/s to deliver live SD feeds with less than one second of talk-back latency. When the system was used to cover the torch relay, the system was configured for 1.5Mb/s.

Engineers recognize that using wireless networks for live links may result in unpredictability because cellular networks do not guarantee bandwidth. The Dejero technology solves the high bandwidth requirement of video by splitting the data across multiple wireless channels — any one of which can vary dynamically based on the carrier. On the receive side, the system's server reassembles incoming data from the multiple wireless channels and delivers the reconfigured video.

For the CTV Olympic torch relay, the Canadian broadcaster mounted a robotic camera in a protective Plexiglas enclosure and affixed it to mobile home. An HD-SDI signal from the camera fed the transmitter and was sent via various carriers back to CTV control rooms along the route. The Web-addressable transmitter was configured over the Internet to direct its feeds to multiple servers at the various CTV ENG receive sites along the

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torch relay path.

The Olympic broadcasts involved only SD video. However, according to company officials, the system can also support HD video, albeit with additional latency. The firm says it will be able to achieve one-second talkback latency over next-generation cell phone networks.

Is your microphone on an endangered species list?

Many users of 700MHz-band wireless microphones received a nasty surprise early this year when the FCC released a list of microphones that will be prohibited from use after June 12, 2010. The list contains the model numbers — manufacturer by manufacturer — of banned models and whether they can be upgraded to meet the new requirements. Under the FCC's order, users of the prohibited models have only a couple of months to switch to legal models of wireless devices or cease operation.

This shouldn't come as a surprise. The FCC's ruling was part of a national shift on the deployment of bandwidth, which is now in "crisis" according to its chairman, because of increased use by mobile telephones and wireless computers. The commission said the wireless microphone transition is necessary to make spectrum in the 700MHz band available for use by next-generation wireless services for consumers and public safety agencies.

The prohibited models have only a couple of months to switch to legal models.

Wireless microphones, in-ear monitors and other wireless devices will continue to be permitted in the remaining UHF TV band (470MHz to 698MHz). Existing 700MHz equipment should be replaced with systems operating in that range or in other parts of the spectrum.

Many sporting groups and others hoped the commission would allow them to use some part of the spectrum and had argued their use of it would not interfere with new devices. Their arguments did not deter the FCC. Much of the spectrum used by wireless microphones was auctioned to wireless carriers for about $20 billion.

The list of banned devices can be viewed at *www.fcc.gov/cgb/wirelessmicrophones/manufacturers.html.* BE

Phil Kurz writes Broadcast Engineering's "News Technology Update" e-newsletter.

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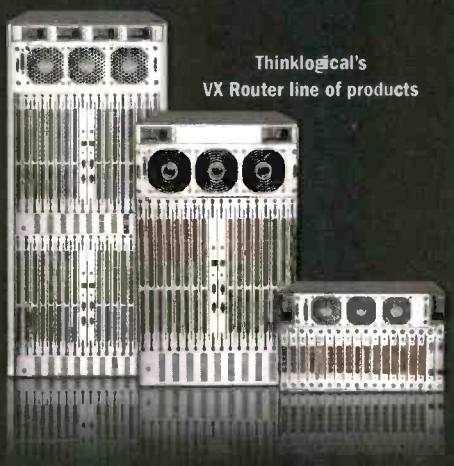

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IP security

Network security is becoming increasingly important as stations move toward network-based storage.

BY RUSSELL BROWN

Virus protection software properly installed and kept up to date is the first step in keeping a network safe. However, with almost all of a station's computers interconnected through IP networks, it's not that simple anymore.

Many people only think of protecting their own computer, while the network administrators must think on a larger scale. Making sure all the computer systems and network links are up and operational is their prime concern, and that starts with network security. Preventing viruses and other malware is the first line of defense.

An increasingly popular technique to gain access to a secure network uses a USB drive with the company's branding. An employee finds the drive in the parking lot and tries to open a file on the network, only to run a malware program instead.

Creating a security policy

A security policy is a list of priorities and rules that upper management has agreed upon as important to keep the station running. The policy should pinpoint what needs to be protected and what it would mean if those areas were compromised. It also outlines the ways in which these assets can be targeted, lists the most vulnerable areas and determines how they can be protected. Goals should be set to achieve the desired level of protection.

Back up your data

Backing up all important data and being sure it will really work if the need arises should be part of the policy. If all else fails, computers can be replaced, but data can't unless it's backed up. Off-site storage is best in case the building cannot be accessed, as a result of a fire or other natural disaster. For large backups, this means using data tapes or even Blu-ray Discs and then transporting them to a remote storage site.

The most current billing and chief engineer's files can be backed up with an online service that works in the background and continually updates as files change. Just make sure to have an off-site record of what online backup systems are in place.

Strategy follows policy

A strategy outlines how to meet the goals set out in the security policy. This includes defining the layout of the network, as well as who is responsible for adding new users and setting up their computers. One of the most important aspects is setting up the rules for any routers and other security software.

Because personnel that use the computer network play a major role in protecting it, an acceptable use statement should be created that outlines the need for security practices and the penalties for not following them.

A recent trend to gain access to a company's network is to leave a USB flash drive with the company's logo on it in the company parking lot for an employee to pick up. When he attempts to open a document on it, a malware program automatically runs.

A security policy should pinpoint what needs to be protected and what it would mean if those areas were compromised.

Following through

One of the hardest things to do is to actually make sure all the policies are being carried out every day. Regular inspections and tests of the network

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are a necessity. It's also not a bad idea to have network security awareness reminders several times a year to help personnel keep in mind how important it is. (See Figure 1.)

Keeping it physically safe

Making sure the equipment is safe and secure is another aspect of network security. Are the doors to the network closets and front panels of the servers locked?

To ensure that critical data and systems are safe, cut off any mission-critical data from the Internet and isolate it from the rest of the network.

At one station, a wireless router that was kept in an unlocked room had its reset button pushed, which reverted it to its factory settings. This allowed anyone to log in and opened the station's network to anyone on the outside. There were no available rooms that locked, so the engineer moved the wireless router to another room and hid it under a plastic milk carton on the floor; he never had any more trouble with it.

Cutting it off

To ensure that critical data and systems are safe, cut off any mission-critical data from the Internet and isolate it from the rest of the network. This may not be possible in all cases, but reducing or limiting the avenues of access for viruses and other malware to reach valuable data and systems is always a good idea. Subnets can be used to allow some subnets to have Internet access and to block the same access to other subnets.

Conclusion

Network security is and will remain a hot topic for all businesses, and broadcast engineers need to learn these lessons, too. As broadcasting moves toward an all-IP infrastructure, keeping a station running will soon depend on ensuring its networks are up and its computer systems are free of malware. BE

Russell Brown is chief engineer at KMTP-TV in San Francisco and writer of Broadcast Engineering*'s "Transition to Digital" e-newsletter.*

How tough is your password?

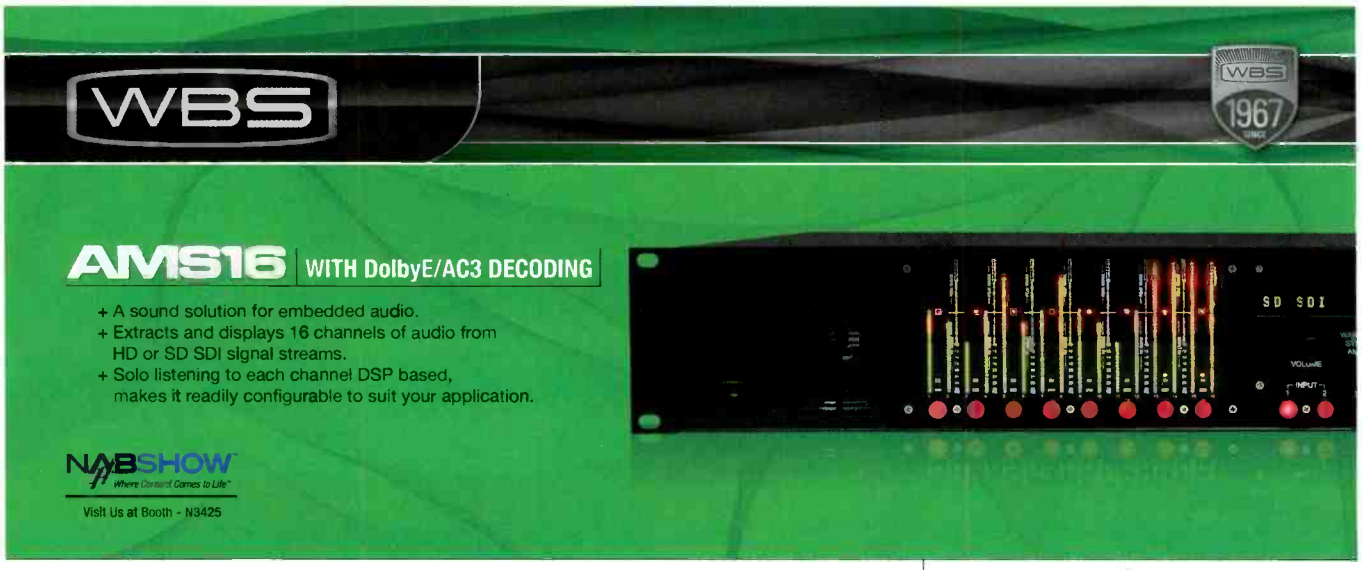
Recently more than 32 million passwords were stolen and posted on the Web, which allowed researchers to examine Web site users' password choices.

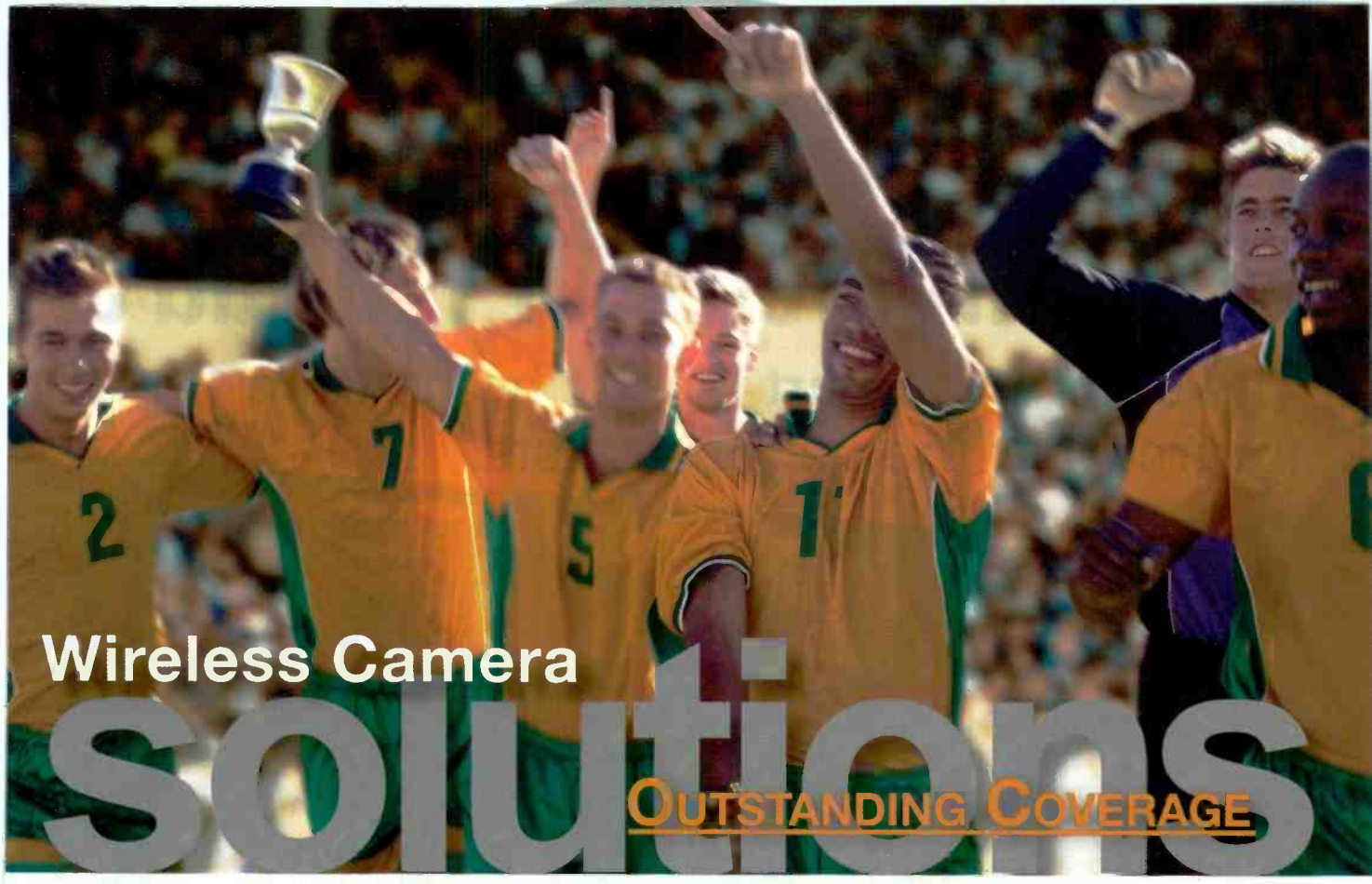
The findings were not good, because most people choose simple short words or numbers. Below is a list of the 20 most popular passwords in use.

Is your password on this list?

1) 123456	11) nicole
2) 12345	12) daniel
3) 123456789	13) babygirl
4) password	14) monkey
5) iloveyou	15) jessica
6) princess	16) lovey
7) rockyou	17) michael
8) 1234567	18) ashley
9) 12345678	19) 654321
10) abc123	20) qwerty

Figure 1. Network users should be reminded to change their passwords multiple times a year.





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The University of Florida's

The state-of-the-art facility helps train future multimedia journalists.

BY MICHAEL GROTTICELLI

At the University of Florida's new 21st Century News Laboratory, the future of electronic newsgathering looks bright. Employing the same HD broadcast and production equipment used in commercial news organizations, the school recently completed the first phase of a multiyear project designed to train students to create content for all multimedia platforms, including print, radio, TV and the Web. The new facility and the technology have propelled it to the forefront of ENG in the digital age.

The project, completed by system integrator Professional Communications Systems (PCS) in a mere three months on the main campus in Gainesville, FL, is the centerpiece of the vision of Dr. John W. Wright, dean of the UF College of Journalism and Communications, and David Carlson, executive director of the college's Center for Media Innovation + Research. Their vision was to create a broadcast news, journalism and communications breeding ground that would "cross-pollinate" students and illustrate a path for the media companies of the future. It is the first of three strategic components of the Center for Media Innovation + Research, which include the news laboratory; a digital lab for strategic communications that will open later this year; and, ultimately, a digital communications think tank and research consortium.

21st Century News Lab

The University of Florida's news lab features a monitor wall made up of nine 46in Samsung LCD screens fed by three Harris Centrio multiviewers.

David Palmeira, a senior design engineer with PCS, and Jeff Gierhart, a Harris systems engineer, designed the significant upgrade to existing facilities. They worked extensively with the university to create a fully networked learning environment. Highlights of the new system include four Harris NEXIO AMP SD/HD baseband video servers configured with a NEXIO SD/HD shared storage area network (SAN), a proxy server and a 9TB Isilon IQ X-series digital file storage system, along with a variety of Ethernet switches to support a state-of-the-art convergent newsroom at the second largest communications college in the nation.

Making it all work together

A Harris NEXIO FCP Integration Gateway provides

a link between the facility's Apple Final Cut Pro nonlinear editing software and the servers. This allows third-party editing directly on the SAN. Low-resolution proxy editing is accomplished with 16 seats of Harris Velocity PRX editing software. Numerous Harris signal processing modules also provide format and resolution conversion from SD to HD (and vice versa), and frame synchronization, in addition to other tasks.

The technology enables a collaborative environment where everyone working on the network can

The facility includes three Harris NEXIO AMP SD/HD servers configured as a SAN.

use material stored on the centralized servers. The college previously had a file-based workflow that used Final Cut Pro workstations (or laptops) attached to portable hard drives for localized storage. That production method proved to be inefficient and expensive.

The 21st Century News Laboratory is a multipurpose facility housed in what used to be an analog photo studio. It includes a 1200sq-ft production studio, complete with professional lighting, a green screen backdrop and a large multidisplay video wall. It also functions as a learning

Students and teachers store their multimedia projects on a 9TB Isilon IQ X-series digital file storage system.

lab, a classroom, a multiplatform newsroom and a media center complete with 7.1 surround sound. A single Panasonic HPX300 on a Vinten Osprey studio pedestal serves as the main studio camera. Students use Panasonic HPX200 P2 camcorders for acquisition in the field.

The studio, which is tied to an existing production control room and a new Extreme Networks Black Diamond switch, doubles as an interactive classroom, complete with five pods accommodating five students each. Students can plug in their laptops and edit stories on the storage array and servers. The Isilon system, with its clustered storage architecture, provides the fast media access and adequate bandwidth required for multiple users to simultaneously and easily locate and retrieve audio and video files.

Taking a multiview for news

A monitor wall made up of nine 46in Samsung LCD screens is fed by three Harris Centrio multiviewer display systems, which are used for a set backdrop during production of the college's daily newscasts as well as for teaching purposes. The Centrio software also provides test and measurement features for monitoring systems status. A conference room with large glass windows adjacent to the studio is also tied into the network and is used for video conferencing, meetings and teaching purposes.

ADC Cat 6 patch panels with Mid-Atlantic cable management help to organize the miles of cabling installed.

Content created in the 21st Century News Lab is used on the Web and on the college's PBS TV station, WUFT, which also has its HD

A Harris Platinum router (at bottom) ties the entire university news lab into the local PBS station WUFT infrastructure.

facilities located in a different part of the building. A Harris Platinum 128 x 256 matrix 3Gb/s compatible video router, passing both SD and HD signals, ties the entire news lab into the WUFT infrastructure. A series of laboratories located in other parts of the building are also tied via Cat 6 cabling into the central storage system.

Designed for expansion

The news lab is just the first phase of a three-phase project. As part of a second phase, the college plans to install an asset management system

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and a node so that students can connect and edit their projects from their dorm rooms or apartments. Instructors have this capability today, but bandwidth needs to be increased to accommodate students remotely working.

A total of 10 edit rooms (labs) are located on other floors of the building, with the News Lab seamlessly connected to each one. Here, numerous Velocity edit systems are used for finishing projects and readying them for air on WUFT or the Web.

Design team

University of Florida
David Carlson, executive director of the Center for Media Innovation + Research
Rob Carr, director of engineering and information technology

Professional Communications Systems
David Palmeira, senior design engineer/project manager
Troy Pazos, director of technical operations
Ed Kothera, project engineer

Harris Professional Services Group
Mark Rogers, account manager
Brian Redmond, project manager
Jeff Gierhart, systems engineer
Eutdel Garcia, systems engineer
Geoff Snell, systems engineer

Results

Working with WUFT and Harris engineers, PCS completed the News Lab upgrade project in a short time frame. Among the project challenges, all of the networked systems had to be robust enough to stand up to student use across six different newsgathering disciplines, it needed to accommodate multiple simultaneous users (both in the News Lab and throughout the building), and it had to be designed and implemented in such a way that it can be systematically disassembled to make way for the second and third phases in the next two years. By all accounts, the project met these expectations, and the students and

instructors couldn't be happier with the results.

Aspiring on-air talent and field reporters at the University of Florida, who must be well versed in all aspects of media acquisition and content creation, now have the tools and technology they need to learn how it's done and see their work on-air.

Because of its advanced facilities and excellent journalism programs, "ABC News" has chosen the University of Florida as one of only five "ABC News On Campus" bureaus in the United States. Student-generated content is frequently aired and carried on ABC Web sites. This provides on-the-job training for students before they enter the professional workforce. BE

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

Technology at work

ADC Patch Panels
Avocent infrastructure management software
AJA Video Mini Converters
Apple Final Cut Pro software
Auralex acoustic panels
Autoscript TelePrompter
Brightline T-series lighting fixtures
Communication Specialties ScanDo HD converter
Extreme Networks Black Diamond 8800 series switch
Harris
- Centrio multiview system
- NEXIO AMP servers
- Platinum HD/SD router
- Velocity edit systems

Isilon IQ X-series storage system
Panasonic HPX300 camera and HPX200 P2 camcorders
Samsung 46in LCD screens
Telemetrics camera control system
Vinten Osprey studio pedestal
Wohler audio monitors

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Taking a *closer* look at this year's *new products*

The 2010 NAB Show has finally arrived, bringing with it a deluge of new products and solutions for your facility. *Broadcast Engineering* is here to help.

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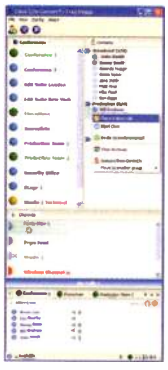

Interfaces with external audio systems, including party line systems, paging systems, program feeds and other matrix systems using a four-wire interface over a standard IP network; allows authorized users with Internet access to easily communicate with other crew members using hard-wired panels and wireless belt packs on the party line and/or matrix intercom circuit who are using hard-wired panels and wireless belt packs; can accept and send audio through a facility's public announcement system, program feed and other four-wire audio devices via most commercially available audio interface boxes.

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AUDIO CONSOLE
Logitek Electronic Systems Pilot

Modular, scalable console provides up to 24 faders; audio sources may be routed as desired to each of the faders; each fader has access to a program bus, three aux busses and cue speaker; bright, wide-angle displays below the faders have room for 16-character source names and support Unicode characters for display of text in multiple languages.

713-664-4470; www.logitekaudio.com
Booth: C2636

CONSOLE
Calrec Audio Artemis

Relies on Bluefin2 for processing; running at 48kHz, Bluefin2 gives Artemis up to 640 channel processing paths, 128 program busses, 64 IFB/track outputs and 32 auxiliaries; relies on Hydra2 for routing; Hydra2 uses high-capacity 8192 x 8192 crosspoint routers while making available a variety of I/O units to provide analog, AES, MADI, SDI and Dolby E formats; features a second compressor/limiter in each channel, more than 70 minutes of assignable delay and three independent APFL systems for multiple operator use.

+44 1422 841310; www.calrec.com
Booth: C1746

AUTOMATIC MIXING CONTROLLERS
Dan Dugan Sound Design Model D-2/D-3

Eight-channel processors patch into the digital insert points of an audio mixing console, detect which mics are receiving inputs and make fast, transparent crossfades, which are voice-controlled; eliminates cueing mistakes and late fade-ups while avoiding choppy and distracting effects common to noise gates; feature Dugan Speech System, which automatically manages any number of live mics; also features the Dugan Music System, which offers automatic downward expansion to help reduce feedback and noise pickup in live performances, and Dugan Gain Limiting, which provides continuous, stepless NOM master gain control.

415-821-9776; www.dandugan.com
Booth: C1944

Take YouTube™ to Air

PICK HIT
BroadcastEngineering
2009

BrightEye Mitto™
Scan Converter For Broadcasters

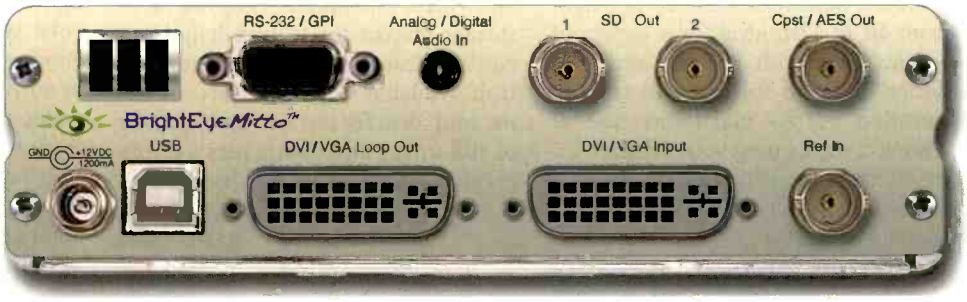
Do You Need to Broadcast Video Content from the Web?

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.

See you at NAB Booth N1929

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

NAB 2010 NEW PRODUCT EXPOSITION

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LINEAR FADER CONTROLLER
Sound Devices CL-9

Acts as a dedicated mixing surface for 788T digital recorder; equipped with eight 100mm ultra-low-latency linear faders and rotary input trim controls with ring LED metering; adds input pan and sweepable, single-band parametric EQ for eight of the 788T's eight inputs with variable frequency, gain and filter Q; makes accessible output level control of the six outputs, dedicated L/R and aux 1/aux 2 output level controls, track-record enabling for each of the 12 record tracks and one-touch soloing of inputs or tracks.

608-524-0625; www.sounddevices.com
Booth: C1354

ELEVATING PEDESTAL
Telemetrics EP-S3

Remotely controlled motorized column can quickly be elevated in height from 4ft to 12ft; ideal for a variety of applications, both indoors and outdoors; designed for fast and smooth elevation at the maximum rate of 1.8ft/sec; can be used with Telemetrics' weatherproof pan/tilt heads, as well as third-party products; has a maximum payload of 60lbs.

201-848-9818; www.telemetricsinc.com
Booth: C8525

WORKFLOW MANAGEMENT SYSTEM
Florical Systems S.M.A.R.T. Central

Provides workflow automation and can be securely accessed from any networked computer; adds new applications that can save time and money, including everything from reporting and monitoring to disaster recovery remote access.

352-372-8326; www.florical.com
Booth: N4329

AUDIO CONSOLE
SSL C100 HDS V2

Features a new processor upgrade option for the Blackrock processing unit and Blacklight, SSL's new high channel count optical I/O format; these options significantly increase the channel count and DSP power for the digital console; the new, higher capacity CPU card greatly expands processing power to cover full DSP options to the increased number of regular channels available.

212-315-1111; www.solidstatelogic.com
Booth: N808

HD VIDEO DISK RECORDER
Doremi Labs V1-UHD

Provides instant access to video, uncompressed recording and networkable operation; is 3RU high and available with fixed or hot swappable internal drives; records HD-SDI and SDI video; includes an external video storage chassis for feature-length recording; features frame-accurate control; available GigE interface makes the unit ideal for fast network transfer of still image and movie files to/from graphics and editing workstations.

818-562-1101; www.doremilabs.com
Booth: C5640

IP AUDIO ROUTER
Logitek Electronic Systems JetStream Mini

Includes analog and digital I/O, profanity delay, silence alarms, input metering, mic processing and interfaces to automation protocols; features fanless convection cooling and 2RU design.

713-664-4470; www.logitekaudio.com
Booth: C2636

PATCH MODULE
Switchcraft StudioPatch Series 1625

Modular design provides audio engineers with a premium-quality TT patch bay that can be used as an individual eight-channel patch module or mounted up to five across into a 1.5RU rack tray; EZ Norm technology enables signal flow to be changed from the front of each channel using a standard screwdriver, and programmable ground lift switches are easily accessed by removing the rear panel; each module connects using two DB25 connectors wired to the TASCAM DTRS.

773-792-2700; www.switchcraft.com
Booth: C8137

LIGHTING FIXTURES
Kino Flo VistaBeam 600 and VistaBeam 300

The pole yoke accessory gives the studio DMX fixtures a welded alloy yoke bale offering 360 degrees of fixture movement to focus the soft beam lighting from a studio grid; the pole/yoke system saves time and money, eliminating the need for ladder access or costly automated rigging and hoist systems; VistaBeam 600 delivers the equivalent of a 4000W Softlight, but uses only 9A of power; both fixtures have a DMX control system and the ability to produce daylight or tungsten balanced light from the same fixture.

818-767-6528; www.kinoflo.com
Booth: C2049

MASTER CONTROL SWITCHER
Utah Scientific MC-4000

Integrated system is designed to handle the most demanding on-air operations in live, automated or automation-assisted operating environments; features new internal squeeze and graphics capabilities, as well as a new control panel option.

801-575-3770; www.utahscientific.com
Booth: N4511

nevion

THE BEST GIVEAWAY EVER AT NAB— PEACE OF MIND

SEE NEVION'S AWARD-WINNING VIDEO-OVER-IP SOLUTIONS.

Video transport over IP is the future. Now Nevion makes concerns about quality, protection, and control a thing of the past. Just a few of our new solutions for video transport over IP:

- IP gateway for video signals (ASI onto IP)—VS908
- Slipless protection switching for ASI—VS7700
- JPEG 2000 compression with mapping onto Gig E—VS901
- Remote monitoring over IP, SONET/SDH or fiber overlay—FCS250

Come see how Nevion solutions provide cost-effective migration to IP, with end-to-end control, protection, quality assurance, and security—regardless of your current network infrastructure. You'll also see new solutions for 3G, fiber and monitoring & management that will future-proof your network. Nevion, building the world's most advanced and comprehensive video contribution networks... and giving you peace of mind.

nevion.com

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April 12 – 15
Las Vegas Convention Center

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MODULAR AUTOMATION

Pebble Beach Systems Neptune

Designed to automate the acquisition, media management and playout of TV channels; enables users to easily manage and adapt to the evolving needs of their broadcast facilities; incorporates an SQL server database, which stores information about the facility's material assets, such as the ID, title, duration, material type and other metadata fields, while also tracking the location of all assets.

917-832-4372; www.pebble.tv
Booth: N6809

PLAYOUT AND REDUNDANCY MANAGEMENT

Vector 3 Vector MultiPlay

Runs on both IT-based and broadcast hardware; offers a full range of playout automation capabilities, ingest, graphics management, channel branding and video server management in a single, highly scalable software package; designed to optimize redundancy management for multichannel broadcasters.

424-442-1501; www.vector3.tv
Booth: N6132

APPLICATION CONTROL PANEL

Hi Tech Systems asigN

Hardware panel can control multiple applications on multiple computers; i-asigN software is used both to configure the panels for appearance and function as well as provide the interface to the connected computers; connection can be via serial, USB or Ethernet port; multiple GPIs and GPOs can be provided.

+44 1256 780880; www.hitechsys.com
Booth: N3100

SDI-TO-HDMI CONVERTER

LYNX Technik
yellobrik CDH 1811

Ideal for converting any SDI video signal (up to 3Gb/s 1080p60) into a standard HDMI signal for monitoring and display; also ideal as an integrated SDI fiber transmission system with HDMI confidence monitoring; an optional fiber interface allows the module to be used for monitoring fiber connections and also function as a fiber converter; the HDMI output displays the native input resolution; therefore, no scaling artifacts are introduced.

661-251-8600; www.lynx-usa.com
Booth: N5011

NEWS SERVER

Florical Systems
NewsRecorder

Integrates with iNews and ENPS to provide the ability to record individual stories; includes a rundown editor to arrange stories in a desired order fast and on the fly.

352-372-8326; www.florical.com
Booth: N4329

AUTOMATED PRODUCTION CONTROL SYSTEM

Ross Video OverDrive

Version 9 features NKeyer support, NRCS CG timer support, new MOS device interfaces and GlobalView GUI, which allows for user-configurable layouts.

613-652-4886; www.rossvideo.com
Booth: N3807

3G HD/SDI ROUTING SWITCHER

Sierra Video openGear routing switcher

Passes 19Mb/s SDI to 3G/s HD-SDI video; available in 8 x 4, 8 x 2, 4 x 4 and 4 x 2 I/O configurations; features include reclocking, automatic input equalization and dual reference inputs; compatible with Dashboard control software; can be controlled via RS-232/422 or with a remote-control panel.

530-478-1000; www.sierravideo.com
Booth: SL4505

SEAMLESS SWITCHER

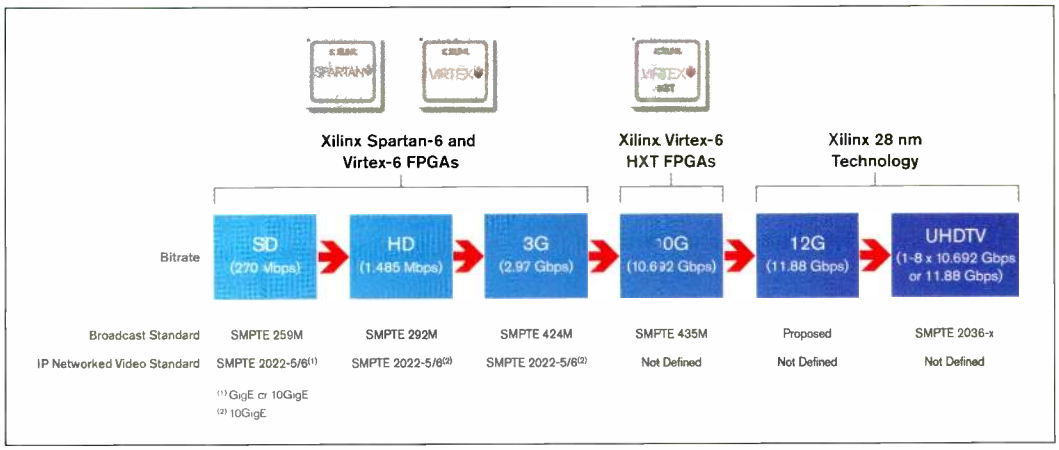
Analog Way Quattro Value

Performs fast and smooth transitions between any video or computer sources; allows seamless switching between one computer input and any other video or computer input; is fitted with four universal A/V inputs, including one DVI and three outputs — one analog, one DVI for the main and one analog for the preview.

212-269-1902; www.analogway.com
Booth: SL1509

How Scalable is Your Broadcast Equipment?

By Ben Runyan



Xilinx has been transforming the broadcast industry for over a decade, enabling the adoption and evolution of standards with a proven track record of technology leadership.

THE NEXT TIME you are getting a pitch from a broadcast equipment vendor, ask that vendor, "How scalable is your system?" To cut to the chase, ask them if their system uses an FPGA (field programmable gate array), a highly flexible integrated circuit (IC) invented by Xilinx over two decades ago. If they say it uses FPGAs, stick around to hear some more. If they say it doesn't, it is time to move to the next vendor.

To make the transition from analog TV to 720p or 1080i, some companies installed equipment based on a fixed IC architecture. Those companies are now finding out that they can't upgrade their current equipment for 1080p broadcasting—they are stuck and now have to buy all new equipment.

Vendors that offer equipment based on Xilinx FPGAs have the distinct advantage of being able to add the maximum amount of scalability to their offerings. They, or even their customers, can re-program the hardware as well as software functionality of the FPGAs in their system to support the ever-shifting requirements of new standards, upgraded interfaces and related CODECs. Meanwhile, systems based solely on microprocessors or chips called ASICs (Application Specific Integrated Circuits) or ASSPs (Application Specific Standard Products) have very limited upgradability.

That is why when the broadcast market made the move to 720p ten years ago, the more visionary equipment companies created Xilinx FPGA-based architectures that gave their customers an upgrade path to 1080p. Now, that same equipment will support 3DTV and beyond.

What's exciting is that Xilinx continues to push its FPGAs to new heights. Today, leading broadcast customers are leveraging an advanced FPGA capability called "partial reconfiguration." This capability allows broadcast equipment manufacturers to offer their customers systems that can be upgraded to support new functions and new standards—without having to take equipment offline. These new systems can be dynamically upgraded—significantly extending equipment life and directly reducing CapEx, OpEx, and increasing overall profitability.

Xilinx offers equipment manufacturers the highest performance, lowest power, and most flexible FPGAs on the market – providing manufacturers with kits to address the changing standards, interface and CODECs necessary to support 3DTV, Digital Cinema (4Kx2K) and ultimately Ultra HDTV.

These broadcast kit solutions for connectivity (SDI, 3G-SDI, 10G-SDI, DisplayPort, HDMI, SATA), leading edge CODECs (H.264, SVC, MVC, JPEG2000), video processing and transmissions enable equipment developers to focus their efforts on differentiation and lowering broadcasters' CapEx and OpEx.

To learn more about the technology at the heart of your broadcast equipment—or the technology that must be at the heart of your next equipment purchase– visit http://www.xilinx.com/broadcast.htm.

About the Author: Ben Runyan is the Senior Manager of Broadcast Business, Xilinx Inc. (San Jose, Calif.). Contact him at more_info@xilinx.com

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WORKFLOW AUTOMATION APPLICATION
Singular Software
PluralEyes v1.1

Offers critical workflow automation tools for analyzing media content and automatically synchronizing audio and video clip sequences, including digital single-lens reflex camera images; includes support for Apple Final Cut Pro and Sony Vegas Pro, as well as an array of new features for managing multi-camera, multitake and dual-system audio productions.

www.singularsoftware.com
Booth: SL4128

MPEG-2 CODEC
Canon

Enables high-quality imaging and audio performance with up to 50Mb/s data recording and twice the color data of the HDV profile format, as well as the recording of 1920 x 1080-pixel HD video; supports higher resolution and increased color data for high-quality video.

201-807-3300; www.usa.canon.com
Booth: C4325

SYSTEM AND ENERGY MANAGEMENT
TSL MDU12-PMi

A system and energy management solution that gives users control over and visibility of equipment racks despite where they're located; provides remote Ethernet control and monitoring of 12 individually switched IEC outputs via secure Web browser with SNMP and e-mail alarms for fuse fail, power fail, over/under current alarm, input voltage and power measurement all alongside 16 GPI inputs; Current Sensing feature monitors the total or individual outlets power consumption and operating temperatures of all rack-mounted equipment, providing clear warnings if variables rise above, or fall below, fully programmable limits.

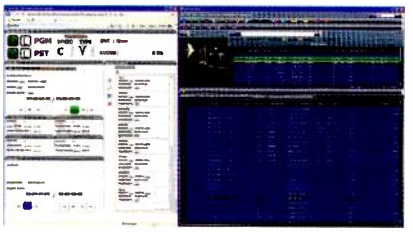
+44 1628 676 200; www.tsl.co.uk
Booth: N6515

DISTRIBUTION AMPLIFIER
ESE DV-212

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

310-322-2136; www.ese-web.com
Booth: C6437

STATION-IN-A-BOX
Florical Systems Acuitas



Features open-architecture environment with off-the-shelf hardware; includes HD playout, graphics, effects and switching.

352-372-8326; www.florical.com
Booth: N4329

MASTER CONTROL
Video Technics OnAir Complete

Combines technology from Video Technics and Oasys for master control production and channel-in-a-box transmission; Apella video servers automate satellite feeds and file-based content that is easily ingested to shared storage with low-resolution proxies and rich metadata; nonlinear editors exchange content as needed; syndicated, ad and locally-produced content are easily accessed from anywhere on the network and quickly prepped for air in conjunction with popular traffic systems.

404-327-8300; www.videotechnics.com
Booth: N6812

MODULAR POWER SYSTEM
Anton/Bauer Tandem 150

Fully automatic system separates the Gold Mount device from the power supply, allowing the user to simultaneously charge a battery and power a camera; when 75W draw is exceeded, the system automatically stops charging and performs solely as a 150W power supply; when camera is turned off or load is reduced below 75W, the system instantly resumes normal operation; users can operate the system from the AC mains at 100V to 240V AC or 50Hz to 60Hz.

203-929-1100; www.antonbauer.com
Booth: C6025

CAMERA PRODUCTION SYSTEM
Azzurro AzzurroCam

Supports an unlimited number of cameras; controls the camera setup functions, audio levels, lighting and switching — all in a compact unit.

201-767-0850; www.azzurrohd.com
Booth: N615

PORTABLE VIDEO SWITCHER
FOR-A HVS300HS series

The newest addition to the company's Hanabi series; the small, 1RU main frame features frame synchronizing and resizing engine on every channel, allowing any SD equipment to be used in full HD mode; has plenty of wipe patterns, including 2-D and 3-D DVE transitions; offers a keyer with chroma key, DSK, dual picture in picture, 16-channel multiviewer and still stores.

352-371-1505; www.for-a.com
Booth: C5219

TECHNICAL FURNITURE SYSTEM
TBC Consoles IntelliTrac

Front and rear device tracks allow unlimited lateral positioning of critical monitors; rack bay turrets may be easily upgraded or relocated, allowing quick, user-friendly modifications; full range of articulating arms for distance, height and tilt control may be used for mounting flat-panel monitors, speakers, phones and task lighting.

631-293-4068; www.tbcconsoles.com
Booth: C12626

CLIENT-BASED WEB TOOL
SGL FlashBrowse II

Allows FlashNet users to capture simple metadata and archive and restore media from many different forms of archive; Web-browser based and can operate on Mac, PC or Linux platforms; enables users to tag clips and mark partial restore start and end points.

615-324-3613; www.sgluk.com
Booth: N1520

SDI MONITOR
ikan VX9

Supports HD-SDI, HDMI, HD/SD component, composite and S-video; initial power options include compatibility with Sony, Canon and Panasonic DV batteries as well as Gold and V-mount professional batteries; has a resolution of 1024 x 600 with Blue Gun, overscan, underscan, pixel-to-pixel and freeze comparison.

713-272-8822; www.ikancorp.com
Booth: C9137

KVM EXTENDER
Thinklogical VelocityKVM

Extends KVM, DVI and analog video, USB, audio and serial signals up to 350m using standard 50um multimode fiber, 1000m using eSX+ multimode fiber and 40km using single-mode fiber; allows for full-frame-rate transmission of uncompressed DVI with no frame dropping; features USB 1.1, USB 2.0 and DDC2B/EDID compliancy, as well as local KVM ports; supports single- and dual-link DVI signals.

203-647-8725; www.thinklogical.com
Booth: SL4729

His tests are a little twisted, but the results are straight.

How do we know our cables and connectors will handle anything you can throw at them? Meet Inspector #13. He has ways to find the answers through tests that twist, crimp and stress cables to the edge of endurance. He meticulously documents every failure to insure success for your network.

When "good enough" isn't really good enough for your critical cata networks, OCC is the only choice. We're proud that we make the toughest cable in the world. Just ask the U.S. Department of Defense. Ours is the only cable in the world to currently carry the U.S. military's highest rating for ground tactical fiber optic cable.

We are known throughout the industry for our relentless quest for product reliability and innovation. At OCC, people like Inspector #13 are always looking for a new twist on quality.

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occfiber.com

Unrivaled Integrated Solutions

NAB 2010 NEW PRODUCT EXPOSITION

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CHARACTER GENERATOR
Compix CynerG2

HD broadcast-quality, dual-channel HD CG; capable of simultaneously outputting graphics in either SD-SDI or HD-SDI; is housed in a conveniently sized 4RU chassis.

949-585-0055; www.compix.tv
Booth: C9515

TRANSMISSION RECORDING SYSTEM
Axon Digital Design TRACS

Transmission recording and compliance system/video logger now features an HD input, which enables compliance recording or video logging without the need for an additional external device for down-conversion; input is available as an option on all single-channel TRACS recorders and does not affect the maximum storage capability.

301-854-6557; www.axon.tv
Booth: N1119

TURNSTILE
Panther High-Low Turnstile

Reduces mounting height of the camera on the dolly by 5ft; offers high-low rig, offset rig, adjustable offset bowl and side-bowl extension; allows the camera to change positions from the central upper position to a near-ground position without removing the camera; bowl extension can be rotated 360 degrees on demand; front element with its bowl can also be rotated and fixed in different angles.

818-764-1234; www.panther.tv
Booth: C11726

DIGITAL CONSOLE
Salzbrenner StageTec Mediagroup CRESCENDO

Targets the needs of users in broadcast and live venues; has a depth of 530mm and supports up to 300 audio channels, 128 summing busses and 48 channel strips; allows users to configure the number of mono, stereo and 5.1 sums, as well as stereo and 5.1 input channel-linking.

888-782-4391; www.stagetec.com
Booth: C1057

PAN AND TILT HEAD
Polecam 3D-Narrow and 3D-Wide

3D-Narrow allows realistic stereoscopic content to be produced from mini HD cameras positioned side by side on a Polecam jib; attaches directly to all standard Polecam rigs; optimized for normal studio shooting and close-ups where it is desirable to match normal human eye spacing; a levelling plate with three fine-adjustment verniers allows each camera to be exactly matched in height and forward angle; setup is quick and easy; 3D-Wide can be added as an option and allows the distance between cameras to be extended so that full 3-D impact can be achieved even in long-shot.

323-633-7033; www.polecamusa.com
Booth: C7933

LCD MONITORS
ikan VX7/VX9

Support resolution of 1024 x 600; feature LED backlighting, HD-SDI inputs, Blue Plus technology, multiple power options and HDMI, HD-SDI, component and composite inputs; 7in and 8.9in models available.

713-272-8822; www.ikancorp.com
Booth: C9137

MULTICHANNEL LEVEL CONTROLLER
Ward-Beck Systems MLC8

Handles AES, Dolby E, Dolby AC3, analog audio or HD/SD embedded signals; equipped with eight LED bar graph 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
Booth: N3425

CAPTION VIDEO MONITOR ADAPTOR
Wohler CD-1

Automatically detects and decodes WST, OP-47 adn EIA-608/EIA-708 subtitles; suitable for any point in the broadcast or production chain; small, externally powered unit translates a 3G/HD/SD-SDI multirate input containing captioning signaling into a burned-in 3G/HD/SD-SDI or DVI signal with open captions added to the picture; output options include two open-caption 3G/HD/SD-SDI outputs, a DVI open-caption output and an RS-232 output of caption contents.

510-870-0810; www.wohler.com
Booth: N3023

CONTROL PANEL
Shotoku Broadcast Systems TR-HP Hot Panel

Ideal for budget-conscious productions where stored camera positions may be recalled automatically, and final on-air framing is made by a single, multitasking operator; features a small footprint while maintaining high-precision joystick control; three-axis joystick and rotary control knob are designed to enable operator to make perfect on-air movements of pan, tilt, zoom and focus; several switch functions are available by way of a maximum of 12 assignable LED-illuminated keys.

310-782-8491; www.shotoku.tv
Booth: C8615

More News Is Good News!

NewsShark

The affordable ENG solution your news department has been waiting for

Visit Us at NAB Booth #SU5717

Digital Journalism Goes LIVE With DSI RF Systems

In this new world of newsgathering, you can give your station the ability to get breaking stories on the air – before your news truck is fully set up – with the DSI NewsShark.

Lightweight and efficient, the DSI NewsShark snaps on the back of most ENG cameras or attaches to a convenient shoulder strap, and provides an instant wireless video and audio connection to your newsroom or on-air studio.

A reporter outfitted with a NewsShark and camera can quickly send live video from the scene of an event, even while in motion. A company staffer dispatched with a NewsShark via taxi or public transportat on can get a live feed from the scene before a typical ENG truck can even get to the site and set up.

NewsShark uses 3G and Wi-Fi wireless technologies (and soon, 4G) to send higher quality v deo than cell phones, without the tangle of wires and hardware that is inevitable when using a laptop computer for backhaul.

The NewsShark has an IFB feed for the air talent and a two-way IFB for the camera operator.

The DSI NewsShark is so simple to use that the operator only needs to power it on. Picture quality is automatically adjusted to compensate for varying bandwidth availability, so that you transmit the best picture that the network can support.

From innovative products including remote camera systems and low latency HD codecs through engineering services, major broadcasters around the world have relied on DSI for over 25 years to answer their call for technical solutions.

Have your station be first on the air from the site of breaking news. Contact DSI RF Systems today to find out more about the surprisingly affordable NewsShark.

DSI
RF Systems, Inc.

26H World's Fair Drive • Somerset, NJ 08873 • www.dsirf.com • (888) DSIRFTV • info@dsirf.com

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CAMERA SUPPORT SOLUTION
ikan Elements

Ergonomically designed system consists of multiple pieces intended to work together; can be configured for any camera setup with existing gear; features 1/4-20 and 3/8 threads on all pieces, five easy-to-assemble parts, all hardware included, easy upgradability, compatibility with all 15mm rail systems and anodized aluminum construction; Fly bundle consists of two durable foam-grip handles, two attaching arms and a cheese plate-style base plate.

713-272-8822; www.ikancorp.com
Booth: C9137

REMOTE CONTROL CAMERA SYSTEM
PENTA Lux Media Plan HD 1200

Designed to capture the intensity of sports and concerts, as well as expand the opportunities for filming within tight spaces; built in small housing with progressive resolutions up to 1080p; can be controlled remotely over long distances.

936-828-6830; www.penta-web.com
Booth: N1023

VIDEO SERVER
Ross Video SoftMetal

Version 4.3 software adds four in/four out configuration, VDCP control protocol over Ethernet, AMP automation control support and Unicode character support; 3000 Series features native support of 3-D stereoscopic playout and record.

613-652-4886; www.rossvideo.com
Booth: N3807

ULTRA-SLOW-MOTION SYSTEM
I-MOVIX SprintCam Vvs HD

Operates at frame rates from 25fps to 2500fps in full HD up to 100 times slower than live action; provides instant replay at native HD resolution and image quality; offered in standard-camera version or optimized for shoulder-mount portable shooting; comprises Vision Research high-speed HD camera, operational control panel, slow-motion remote and CCU.

+32 65 321 535; www.i-movix.com
Booth: C4644

MULTICHANNEL PORTABLE CAPTURE SYSTEM
Alteran Technologies ViTaDi-AutoPack

For in-house or portable ingestion; can be embedded within a customer's video library or archive; comes complete with custom-configurable computer, storage, confidence monitoring and multichannel capturing system; can plug into a pre-existing digital asset management system or fiber/Ethernet-based SAN; can easily roll from department to department or to another client's location.

818-998-9100
www.alterantechnologies.com
Booth: C9733

FIBER-OPTIC CAMERA TRANSCEIVER
Telecast Fiber Systems CopperHead 3000 Series

Provides a single fiber-optic link between any professional camera or camcorder and a broadcaster's truck, control room or video village position; designed to handle all vital camera signals; can be configured for specific applications such as ENG or multicamera use.

508-754-4858; www.telecast-fiber.com
Booth: C8925

GRAPHICS SYSTEM
Harris G-Flow

A toolkit of applications that enables broadcasters to integrate complex graphics into NLE editing platforms; allows graphics designed for live broadcasts to be reused quickly and easily in the broadcaster's preferred NLE environment.

800-231-9673
www.broadcast.harris.com
Booth: N2502

VIDEO CAPTURE ADAPTER
Maxell iVDR VC102

Direct-to-disk video capture adapter converts the output of a digital video camera to a nonlinear editing format and stores it on an iVDR drive; features an easy-to-use comprehensive menu system on a backlit display; by converting the output of a digital video camera directly to a nonlinear editing format suitable for storage on the company's iVDR drive, the task of capturing files before editing them is eliminated; reduces the overall amount of hardware used and time required for processing.

800-533-2836; www.maxell-usa.com
Booth: C8737

TOUCH CONTROL SYSTEM

Shotoku Broadcast Systems TR-T

Now available in 16:9 widescreen configuration; integrates with most HD/SDI routers; high-resolution VGA touch screen uses the latest seamless glass Acoustic Pulse technology, designed to provide exceptional accuracy and durability over many years of intensive use; configurable screen layout supports 16 cameras displayed in any configuration; panel uses multicolored illuminated keys to communicate system status and control settings, with a high-precision joystick for ultra-smooth on-air control.

310-782-8491; www.shotoku.tv
Booth: C8615

RECEIVER/DECODER

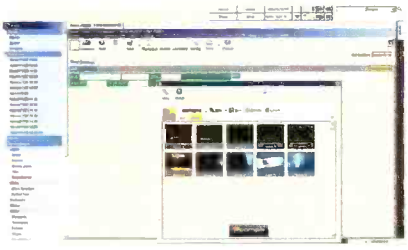
Screen Service Broadcasting Technologies XBT 704

In analog operation, receives an RF input signal and delivers it through its output connectors; acts as a bypass for the RF analog signal; in digital operation, receives an RF digital input signal and decodes the contents; extracts a program from the bouquet and delivers it into an ASI output signal; signal feeds a transposer; features two-channel balanced analog audio output and doubled SDI interface for digital video with embedded audio.

+39 030 358 2225; www.screen.it
Booth: SU4908

MOS INTERFACE

Compix CompixMOS 2.5



An easy-to-use MOS interface for advanced newsroom integration of content from graphics systems, still stores and clip players; allows insertion of CG events directly into newsroom scripts; by supporting the integration of discrete external devices, the interface allows users to build high-quality news products ready to air from within the NRCS rundown script interface.

949-585-0055; www.compix.tv
Booth: C9515

NAB 2010 NEW PRODUCT EXPOSITION

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CLOSED-CAPTIONING MANAGEMENT

RadiantGrid Technologies Closed-Captioning Management Module

Supports SMPTE 436M closed-captioning and AS-03 format, which is a constrained subset of the MXF standard that allows interoperability with editing workflows and video playout servers from AMWA member companies; enables broadcasters to extract closed-captioning from media sources and insert closed-captioning back into the transcoded output file concurrently with other transcoding functions.

877-828-0094; www.radiantgrid.com
Booth: SL2327

2.4GHZ RF NETWORK

Zaxcom ZaxNet

Designed for the distribution of remote control signals, time code, IFB audio and metadata for production sound; wirelessly links Zaxcom's Deva/Fusion, digital recording wireless systems, encrypted IFB receivers and compatible digital slates into a single system for audio recording and metadata distribution; signal is generated by Deva/Fusion and broadcast via an IFB100 on a 2.4GHz signal; the IFB audio, time code, metadata and wirelss remote control commands are then received by the ERX1, ERX1TCD and TRX series.

973-835-5000; www.zaxcom.com
Booth: C154

MAM APPLICATION

Dalet Digital Enterprise Edition WebSpace

Advanced, portable Web-based MAM and news production application uses latest Web 2.0 technologies; features professional video and audio production tools, an enterprise search engine and user-friendly interface; streams media in H.264 or MPEG-4, making remote access to the main archives simple and fast.

212-269-6700; www.dalet.com
Booth: SL4720

SWITCHER

Miranda NVISION Compact CQX

16 x 8 router features two "clean and quiet" outputs and six auxiliary outputs; offers a unique design with ±3 line buffer, reducing the need for costly timing equipment; supports 16 channels of embedded audio; provides multiple transition types; ideal for master control back-up/bypass and simple master control applications.

514-333-1772; www.miranda.com
Booth: N2515

CG AND GRAPHICS PLATFORM

Ross Video XPression

Version 3.0 features enhanced MOS workflow integration with newsroom systems, stereoscopic template creation and output rendering for 3-D productions, enhancements to Material Manager, automatic center-cut SD outputs for HD templates and other creative and productivity features.

613-652-4886; www.rossvideo.com
Booth: N3807

HD CAMERA

I-MOVIX SprintCam V3 HD

Enhanced functionality includes image capture at frame rates of 150fps-2000fps and instant replay in 1080i HD resolution; features simultaneous capture and record, built-in intercom, integration of live and replay views in the viewfinder, segmented memory, a more compact CCU housing, flexible EVS Multicam integration, auto-clip to enable mark-in to mark-out replay from the CCU, a digital lens interface for better iris and lens switch control and added flexibility in the viewfinder interface to accommodate either Sony CRT or Grass Valley.

+32 65 321 535; www.i-movix.com
Booth: C4644

GRAPHICS SOFTWARE

Pixel Power Clarity Version 9

The latest version of the software for the entire range of Clarity broadcast graphics systems now features an extensive update of Clarity 3D enabling operators to build and deliver sophisticated 3D graphics with real-time data that can be edited right up to air time.

818-276-4515; www.pixelpower.com
Booth: N2034

CAPTION PLAYOUT AND MANAGEMENT PLATFORM

Softel Swift TX

Flexible, cost-effective caption and subtitle management platform reduces workflow complexity and increases reliability and productivity; features real-time transcoding and a range of automation interface and file format support.

203-354-4602; www.softelgroup.com
Booth: N2534

LED LIGHT MODULES

Anton/Bauer EledZ/ULHM-LED

Complement existing UltraLight Series and ElipZ battery systems; designed to maximize HD camera battery run time by cutting down the total light power consumption; include 3200K filter; provide heat- and flicker-free soft light of 5600K while consuming little battery power.

203-929-1100; www.antonbauer.com
Booth: C6025

White Paper

75 Years of Driving Innovation

ROHDE&SCHWARZ

Integrating Mobile Digital Television Into ATSC Digital Television Facilities

Mobile Digital Television (Mobile DTV) will be a completely new medium for distribution of television programming to devices ranges from laptops and netbooks to smart phones, portable DVD (and now DTV) players, and in-vehicle entertainment systems. It differs from other current and proposed mobile television systems because it is the only one that will be offered by existing over-the-air (OTA) broadcast television stations. This provides broadcasters with the possibility of using modified existing facilities to offer entirely new programming, including local content, standard network programming, and even paid content to mobile users.

The challenge for broadcasters is twofold: finding a way to produce revenue through advertising or monthly subscriber fees, and cost-effectively adding Mobile DTV to their current ATSC DTV facilities. The second challenge requires modifications from the studio to the transmitter, and includes both hardware and software. As Mobile DTV is an entirely new enterprise, there has been no clear roadmap to follow.

This white paper provides that roadmap along with information about all of the elements of constructing such a facility, including discussion of encoders, multiplexers, time references, middleware (ESG, program guide, and PSIP), as well as transmitter issues including whether or not to use a new transmitter or exciter or retrofit existing systems, time references, and satellite-to-transmitter-link (STL) considerations. It also includes examples that illustrate typical Mobile DTV system scenarios.

THE FUNDAMENTAL CHALLENGE

The current OTA ATSC digital television standard in the U.S. serves only fixed users. The signal conditions experienced in mobile use are not considered in the ATSC digital standard. As there are a dwindling number of households that receive television exclusively over-the-air via an antenna, it would presumably be beneficial for broadcasters to add value existing OTA facilities by offering "digital TV" not just to fixed users but to users with Mobile DTV-ena

Read the full article at
www.rs-us.net/dtv012

ADVERTISEMENT

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CENTRALIZED GRAPHICS WORKFLOW
Pixel Power Management Console (PPMC)

A Windows-hosted application that enables remote and local configuration, management and operational control of any Pixel Power graphics system; with support for BrandMaster, Clarity, LogoVision and applications including Pixel Promo; designed to facilitate centralized graphics hubs and streamline the distribution of graphics to remotely located stations and affiliates.

818-276-4515; www.pixelpower.com
Booth: N2034

WIRELESS AUDIO INTERFACE
JK Audio BlueDriver-F3/M3

F3 plugs directly into a dynamic mic or the mic-level output from a mixing console; 3.5mm stereo jack contains a mic-level output suitable for recording; has a three-pin female XLR connector; M3 plugs into the mic input channel of a mixer; 3/5mm jack will accept a signal from the headphone output of the mixer for transmission back to the cell phone or headset; has a three-pin male XLR connector; both feature 120V-240V AC power supply, 33ft range and internal Li-Ion battery that yields more than 10 hours of talk time.

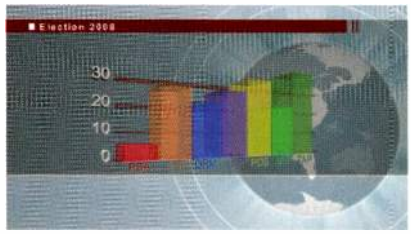
815-786-2929; www.jkaudio.com
Booth: C2010

IFB BODY PACK RECEIVERS
Zaxcom ERX1/ERX1TCD

Receive high-quality digital audio, time code and metadata from any IFB transmitter in the Zaxcom TRX series; each unit's LCD shows time code and current scene and take metadata in real time, with a hold button for script supervisors; ERX-1TCD has a built-in time code reader/generator and output to jam digital slates continuously, preventing time code drift between Deva/Fusion and the slate; both units contain a 1kHz frequency-adjustable notch filler to eliminate the transmission of tone from the mixing console.

973-835-5000; www.zaxcom.com
Booth: C154

CHARACTER GENERATOR
Orad Morpho 3D



Used for on-air graphics, channel branding and as a character generator; delivered in a 2RU rack-mountable chassis; offers 3D creation and design capabilities; features flexible playback based on a single application, with real-time graphics rendering; integrates with newsroom systems using the MOS protocol.

201-332-3900; www.orad.tv
Booth: SL2014

SUBTITLING/CAPTIONING MANAGER
Softel

Allows broadcasters to manage caption/subtitle binding in the workflow, including early, late and live binding; combines Swift TX subtitle and caption playout and management platform with Swift vTX caption and subtitle encoding software to provide a master subtitle and caption control center that seamlessly integrates in the workflow to automate binding; includes ScheduleSmart, which efficiently, dynamically manages the binding of ancillary data, whether early, late or live.

203-354-4602; www.softelgroup.com
Booth: N2534

BROADCAST TRAFFIC MANAGEMENT SYSTEM
Broadcast Traffic Systems Enterprise with RIA

Available on Windows, Linux and Mac OS and is compatible with Microsoft SQL server, Oracle and MySQL databases; Rich Internet Applications functions are accessible on in-house networks as well as over the Internet; can be linked seamlessly with broadcast automation systems; schedulers have access to real-time ingested material information as well as playlist and as-run interfaces; configurable schedule validation processes ensure that broadcast output is error-free; provides a comprehensive set of management reports and graphical analysis tools based on the operational database.

805-856-9103; www.bts.tv
Booth: N4019

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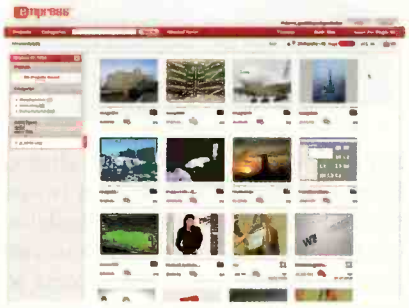
914-819-0495; www.riedel.net
Booth: C6747

DIGITAL ASSET MANAGEMENT SYSTEM

Empress Media Asset Management eMAM 2.8



Secure data power center is universally accessible at any time on all platforms in addition to a Web platform with simple internal and external file-sharing capabilities; holds and automatically organizes content and media; provides an easy way to upload, download and send heavy volumes of files.

212-643-4898; www.empressdigital.com
Booth: N1516

MEDIA SERVER

Omneon MediaDirector 2202 and MediaDirector 2201

Designed for the Spectrum media server; meets the growing demand for additional SD and HD channels; provides more network file access bandwidth; supports the greater number of edit seats used in fast-paced production environments; extends the Omneon Spectrum server by increasing the total system bandwidth, enabling more simultaneous, real-time channels and establishing IP file access performance; MediaDirector 2201 is designed to bring bandwidth advancements to users who may require a lower level of overall system scalability.

408-585-5000; www.omneon.com
Booth: N5106

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NAB 2010 NEW PRODUCT EXPOSITION

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WIRELESS HEADSET INTERFACE
JK Audio BlueSet

Plugs directly into any ClearCom, RTS/Telex TW PL belt pack; a switch selects between connection to a third-party Bluetooth headset or a cell phone; 3.5mm stereo headset jack contains a mic-level output signal suitable for recording, with the headphone signal on the left channel and the Bluetooth return signal on the right; available in female and male XLR four- and five-pin versions; features 120V-240V AC power supply, range of 33ft and internal Li-Ion battery that yields more than 10 hours of talk time.

815-786-2929; www.jkaudio.com
Booth: C2010

SHARED-STORAGE SYSTEM
Sonnet Technologies
Fusion RX1600Fibre

Expandable 16-drive RAID shared Fibre Channel storage system is optimized for video editing; available in 16TB or 32TB configurations; can provide direct, high-speed access to assets for up to four users without a dedicated server or an added fiber switch; employs a four-port 8Gb Fibre Channel interface; delivers aggregate bandwidth up to 1000MB/s read; support for RAID 5 and RAID 6 formatting provides data protection in the event of single- or double-drive failure.

949-587-3500; www.sonnettech.com
Booth: SL7727

LED LIGHTS
Gekko Techı
kezia 200

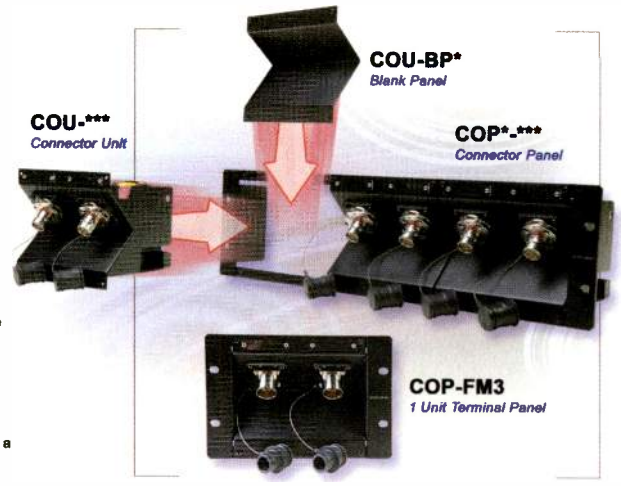
Offer precise tunable whites a
ming under local or DMX c
in addition to tunable whites
2900K to 6500K range, the e
tainment version can also proc
millions of other colors; kezia 50
comparable in output brightness t
a 400W tungsten fresnel lamp hea
yet consumes only 50W of electrical power; kezia 200 has a similar brightness to a 1kW tungsten source while consuming only 190W of power; both generate less heat than more traditional fixtures; color temperature accuracy also remains constant as the light is dimmed.

+44 8448 005 326
www.gekkotechnology.com
Booth: C3743

CANARE digital interconnect technology

Hybrid Fiber-Optic Camera Connector Panels

Features
- SMPTE 311 Standard
- Integrated splice enclosure
- Easy maintenance and installation
- Patented Design modular system
- Available in 2RU, 3RU and a variety of Configurations

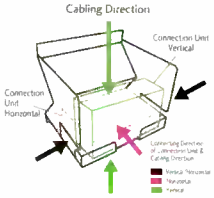


Accessories


Hybrid Camera Cable Checker


Hybrid Camera Cable

Support 5-Directional Wiring
Cabling Direction




Optical Splice Box

canare.com | 973.837.0070 | sales@canare.com | hybrid fiber-optics & EO/OE | snake systems | connectors | cable reels | patchbays | cables

BASEBAND VIDEO SERVER
Harris NEXIO Volt

Supports up to four SD/HD- or SD-only channels; built on the same platform as the NEXIO AMP advanced media platform; provides SD and HD baseband I/O, reliability and direct access to the NEXIO shared-storage network in a slim-line, 1RU package.

800-231-9673
www.broadcast.harris.com
Booth: N2502

MEDIA ASSET MANAGEMENT
Bitcentral Oasis 3

Enables stations to access, archive and share content anytime, anywhere; with the browser-based solution, stations can quickly locate any story, proxy edit the video and download the package from the field or the newsroom; sophisticated rights management allows existing content to be shared and used in rundowns across station groups with or without any restrictions.

800-214-2828; www.bitcentral.com
Booth: SU2312

MAM CONTROL SOFTWARE
Alteran Technologies
ViTaDi Control Software

Controls the interface between the ViTaDi RoboPack and the encoding hardware; organizes the capture data, allowing one-touch ingests and metadata embedding without any operator involvement; uses Alteran's smart capture system, which enables ingest to be accomplished with or without client-provided data or time code.

818-998-9100
www.alterantechnologies.com
Booth: C9733

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NAB 2010 NEW PRODUCT EXPOSITION

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VIDEO SERVER
LEIGHTRONIX NEXUS.5

Single-channel digital video server; equipped with a fully integrated TV automation interface and features stand-alone operation and simultaneous playback and record capabilities; advanced digital video messaging features include video overlay, emergency messaging and multiuser, Web-based video slide creation.

800-243-5589; www.leightronix.com
Booth: C9015

CONTENT MANAGEMENT SYSTEM
Ericsson WatchPoint

Designed for the centralized management of any metadata format, content type and any workflow process; enables visibility of the content that enters the library throughout the content lifecycle; increases overall operational efficiency through the automation of customized content processing via a rules mangament interface and extensible workflow; provides the infrastructure for an efficient multiscreen strategy, accelerating VOD business on multiple platforms including mobile and Web.

678-812-6300; www.ericsson.com
Booth: SU3308

ARCHIVE SYSTEM
Cache-A Pro-Cache

Network-attached archive appliance enables creative professionals to create source masters in acquisition workflows when using the new memory card or disk-based cameras; provides long-term archival storage with easy access at every stage of production; rack-mountable solution offers an internal 2TB of RAID configurable as either striped for maximum speed (RAID 0) or for 100 percent protection with mirrored reliability (RAID 1); additional ExpressCard and eSATA connections make it ideal for fast archiving of direct connected storage.

866-931-5560 x 1; www.cache-a.com
Booth: SL7906

MAM SYSTEM
Front Porch Digital DIVAdirector v4.1

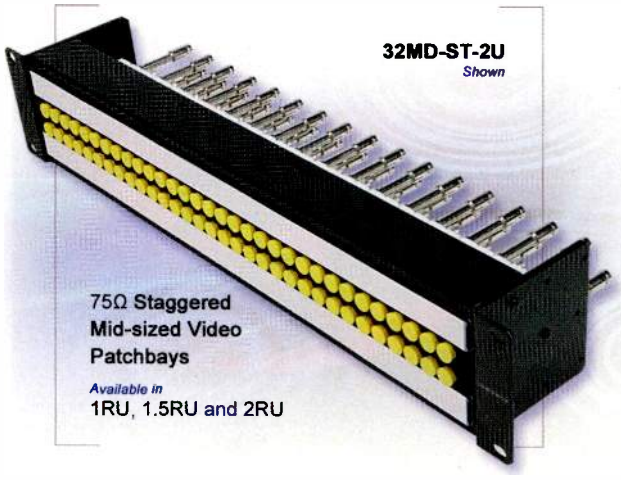
Enables operators, using their Web browsers, to search, locate and retrieve stored media assets directly from their desktops; new features include a revamped and simplified browser interface, support for identification and retrieval of clips with noncontiguous time code, and management of remote proxies without the need for their replication specifically for DIVAdirector; offers enhanced integration with SAMMA Solo system.

303-440-7930; www.fpdigital.com
Booth: N5806

AUTOMATED CHANNEL-IN-A-BOX SOLUTION
Weather Metrics FlexChannel Suite

Designed to help TV stations target viewers with hyper-local information and new advertising opportunities on-air, online and on mobile devices; is comprised of FlexChannel, FlexChannel Lite, FlexChannel Mobile and Flex WebApps; integrates information, data and new revenue streams from multiple sources to generate a turnkey main, digital, cable or mobile TV channel; can produce a channel without the need for additional personnel.

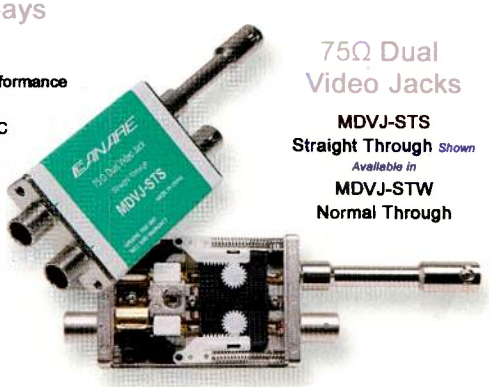
913-438-7666; www.weathermetrics.com
Booth: SU2613



CANARE
digital interconnect technology

Mid-sized
Video Patchbays

Features
- Superior isolation performance up to 3.0GHz
- Industry standard BNC plugs can be used
- 32 channels of I/O into 1RU and 2RU
- Canare original reliable rotary switch
- Lightweight
- Available in Normal & Straight Through Configurations



75Ω Dual
Video Jacks

MDVJ-STS
Straight Through Shown
Available in
MDVJ-STW
Normal Through

Featuring Canare's Exclusive Rotary Switch Technology

canare.com | 973.837.0070 | sales@canare.com | hybrid fiber-optics & EO/OE | snake systems | connectors | cable reels | patchbays | cables

CENTRALIZED RIGHTS MANAGEMENT SYSTEM

Pilat Media Advanced Content Rights Management System

Based on IBMS features and technology; enables users to record contractual terms and assign rights to centrally log and manage the consumption and distribution terms for all acquired or produced content, both long form and short form, across all types of services; a comprehensive application programming interface allows integration with third-party systems.

877-873-4267; www.pilatmedia.com
Booth: N5812

ENCODER/DECODER

NTT Electronics HV9100 series

Supports both HD (1080i/720p) and SD (480i/576i); additionally supports, optionally, up to 16 channels of audio input capability and an IP interface; compatible with the 4:2:2 Profile.

201-556-1770; www.ntt-electronics.com
Booth: SU7217

WORKFLOW AUTOMATION AND MANAGEMENT SOFTWARE SUITE

SGT VEDA

Features file ingest that can take over the workflows for file acquisition, manually or automatically, and different presentation filters to control the accurate management of incoming files, deal with errors, follow up on external requests and validate manual imports; enables operators to monitor all ingest globally or locally; middleware includes Locator Engine components that supervise the exchange zones, analyze the technical features of the files, retrieve editorial information and reference these programs in the database.

+33 1 64 73 74 74; www.sgt.eu
Booth: N1402

UNIVERSAL MEDIA READER/WRITER

Sonnet Technologies Qio

Designed for in-studio or on-location applications; features dual P2, SxS and CompactFlash slots; can transfer data from two cards concurrently; an included adapter handles SDHC cards; moves files between any cards, attached drives or host computer with aggregate bandwidth up to 250Mb/s; integrates a four-port SATA controller based on Sonnet's Tempo SATA E4P card, enabling users to connect two Sonnet Fusion F2 portable storage systems or up to four eSATA drive enclosures for access of up to 20 SATA drives.

949-587-3500; www.sonnettech.com
Booth: SL7727

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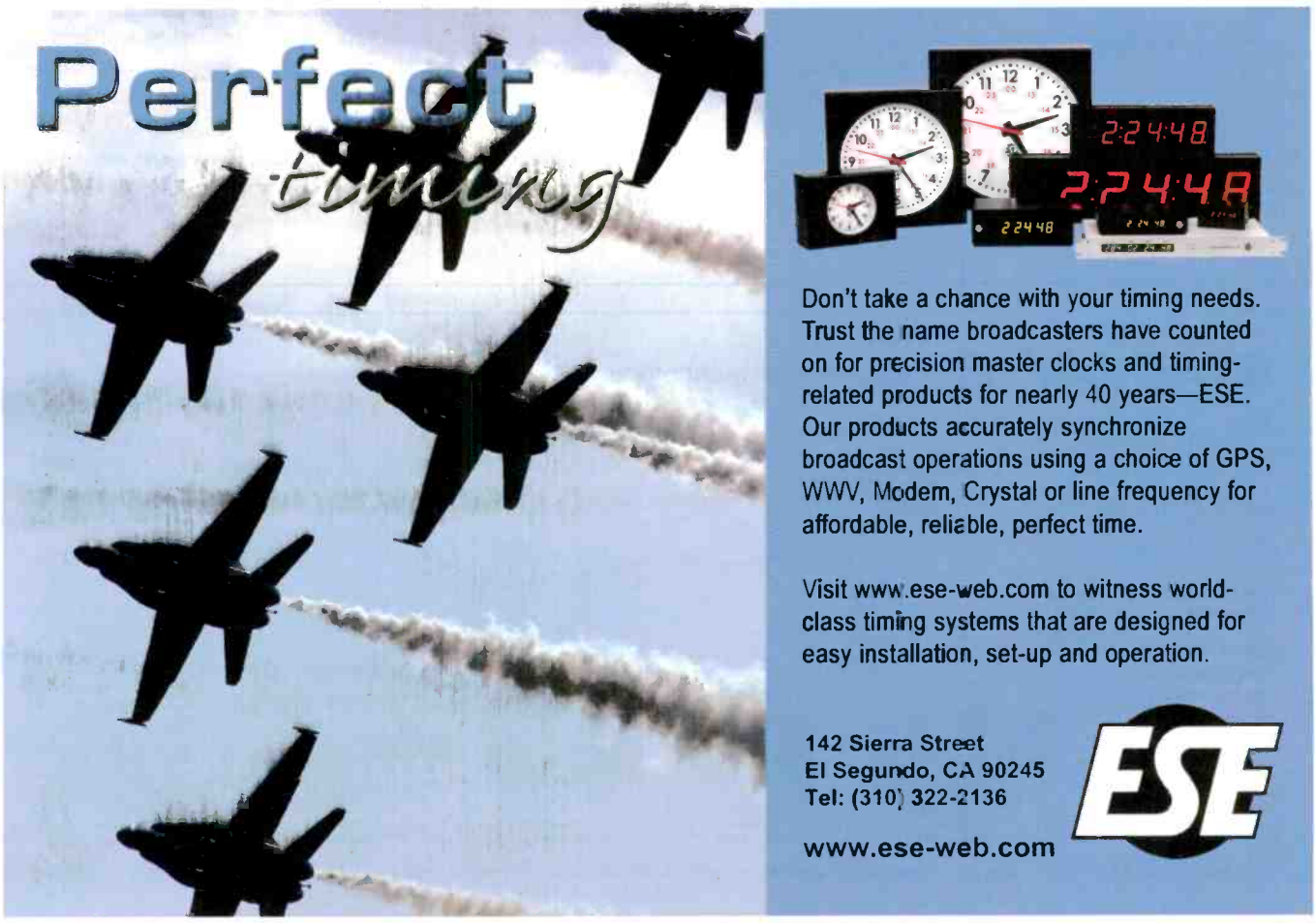

See Us at NAB Booth #C6437

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MULTICHANNEL PORTABLE CAPTURE SYSTEM
Alteran Technologies
ViTaDi-RoboPack

Combines the ViTaDi-AutoPack with a robotic system for rapid ingest of multiple video streams; comes complete with a choice of VTRs — Betacam, Betacam SP, Digital Betacam, Betacam IMS, Betacam SX and HDCAM; also includes the ViTaDi-AutoPack control unit, storage, confidence monitoring and software.

818-998-9100
www.alterantechnologies.com
Booth: C9733

PLAYOUT SERVER
Vector 3 VectorBox

Pairs a robust master control room feature set with third-generation channel branding that includes real-time RSS and XML updates and integrated effects; offers real-time SD and HD conversions for multiformat transmissions; turnkey system is compatible with new and existing third-party broadcast equipment.

424-442-1501; www.vector3.tv
Booth: N6132

MEDIA SERVER
Omneon Spectrum

Scalable, reliable and cost-effective video server platform for multichannel playout, news, sports highlights and studio production workflows; new components dramatically expand the system's capability to support today's demanding bandwidth-intensive broadcast environments..

408-585-5000; www.omneon.com
Booth: N5106

DIGITAL ARCHIVING SOLUTION
XenData X800

Has an external 800GB LTO-4 tape drive that connects to a Windows 7 desktop or tower computer; features new XenData6 software, which provides easy-to-use archive, restore and tape management functionality; archiving to LTO tape is as easy as dragging and dropping files and folders to the tape drive using Windows Explorer; files and folders may be restored from tape by dragging and dropping to any available local logical drive or network share.

925-465-4300; www.xendata.com
Booth: N6609

AUTOMATED METADATA PACKAGING SOLUTION
Anystream Agility extension

Addresses challenges of adapting and transforming metadata to meet specific requirements of each platform and distribution outlet; automates the packaging of both metadata and media to enable a cost-effective, scalable process for delivering full content packages to various outlets and platforms from a single video and metadata source.

703-450-7030; www.anystream.com
Booth: SL2010

CANARE digital interconnect technology

Canare Fiber Optics Systems

EO/ OE Optical Converters.

Key Features & Benefits

- SMPTE 259M & 292M
- Multi-format HD-SDI, SD-SDI & DVB-ASI
- Mux/Demux enables 8/16Ch in one fiber
- Compact Design Power supply 16 modules within 1RU Frame
- Passive optical splitters FDM-2, FDM4

Digital Audio AES-3id
Video HD-SDI
Network 100BASE-TX
Control RS-422-/RS-232

161UPSB *Shown*
2PS *Shown*
6PS *Shown*

AES/EBU EO-500/OE-501
Ethernet TRM 210/220
RS 422/232 Controller
CWDM Mux/Demux
Converter Optical

canare.com | 973.837.0070 | sales@canare.com | hybrid fiber-optics & EO/OE | snake systems | connectors | cable reels | patchbays | cables

Medianet: An Optimal Foundation for Digital Media Production

INSIDE

File-based media production is poised to transform the industry. Find out how medianet technologies – including a Media Data Center platform designed specifically for media workflows – can help broadcasters innovate, collaborate, and deliver a new generation of media experiences.

Setting the Stage for Medianets

It's an exciting time to be in media. Groundbreaking changes in technological innovation and consumer behavior are reshaping the industry, transforming the way broadcasters produce and distribute content. Many factors are driving this transformation, including the rise of high-definition (HD) video (with its huge new bandwidth and capacity demands), proliferating delivery channels, and the emergence of bidirectional and multidirectional video experiences. Today, feeding the consumer's insatiable appetite for media means delivering content to the TV over multiple delivery channels, and increasingly, to PCs and mobile devices over the Internet.

This evolution offers broadcasters opportunities to create innovative new content experiences, streamline media production, and exploit new delivery mechanisms to generate revenue from original and archived content in new ways. But it also introduces extraordinary complexity, with more media formats, resolutions, and delivery channels to account for than ever before.

Broadcasters worldwide already recognize the critical first step in adapting to today's media paradigm: a transition to file-based media. In fact, 69 percent of broadcasters are planning to migrate more than half of their production workflows to fully file-based environments by 2011. However, this transition is a major undertaking. It requires a new approach to media production workflows and video distribution. It requires a medianet.

A New World of Medianet Technologies

A medianet is an all-IP Next-Generation Network (NGN) optimized end-to-end for demanding video and rich media services. It allows broadcasters and service providers to create a single, scalable IP architecture that extends from the point of content ingest through every aspect of editing and production, across video contribution and distribution networks, and all the way to the consumer's screen.

By embracing medianet, broadcasters and media companies can:

Transform video production and distribution by enabling stakeholders throughout the media value chain to collaborate in new ways and create new kinds of media experiences

Reduce time-to-air with a streamlined production workflow that eliminates linear tape-based production processes and allows multiple teams and users – post-production, marketing, legal, online distribution – to access content at the same time

Reduce costs by virtualizing resources, consolidating equipment, and converging IT and production functions over a single IP NGN

Provide nonstop operation through a network infrastructure that has been independently tested and proven to deliver ample performance and scalability for HD media services

Monetize media more effectively with the ability to produce and distribute content for any device or platform, rapidly introduce new services, and efficiently access and control media archives

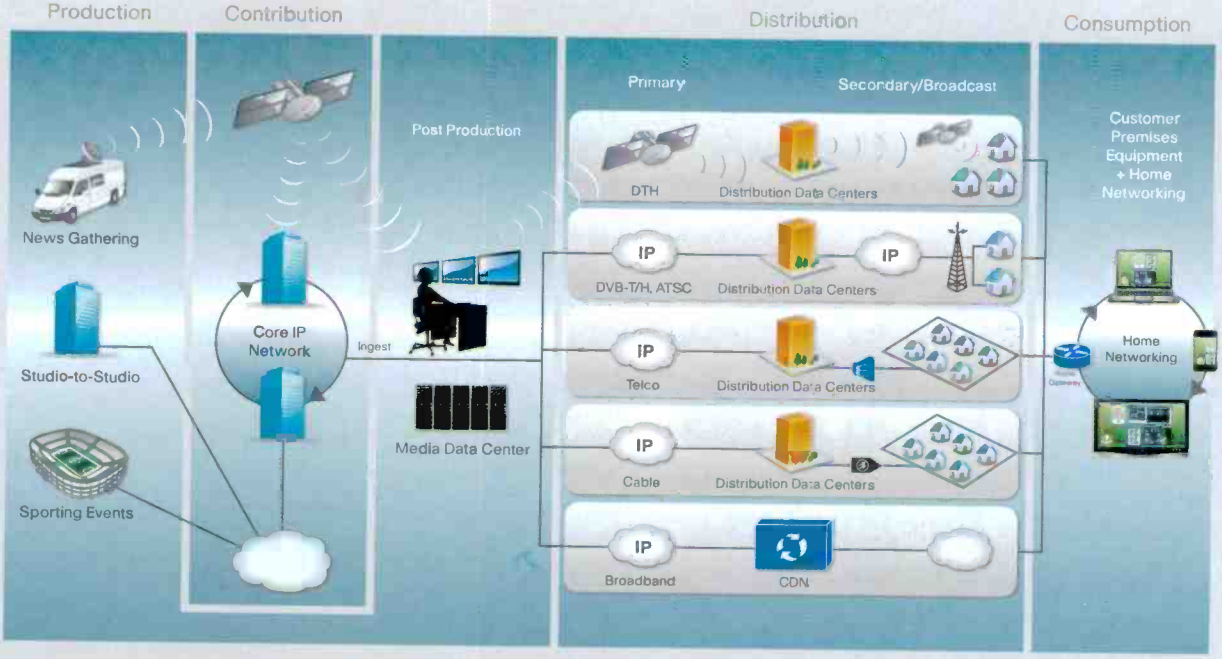
Cisco is leading the way in medianet technologies, and broadcasters worldwide are already using Cisco solutions in demanding HD media environments. Now, Cisco is taking medianet innovation a step farther with the Cisco® Media Data Center (MDC).

A Media Workflow Platform for the Future

The Cisco MDC provides the ideal platform for powering a new generation of file-based media workflows. This advanced, video-optimized data center architecture lets all production entities and business units share a common technology infrastructure and a common file-based storage system. It enables broadcasters to lower capital and operational costs, effectively manage growing complexity and scale, and unleash unprecedented creativity and innovation in media services.

Read on to learn more about how the Cisco MDC provides the ideal medianet foundation for tomorrow's file-based production environments.

Figure 1: Medianet Architecture



A Powerful Platform for Transforming Media Workflows

In media production, creativity has long been bounded by the physical limitations of production workflow processes. Editing and post-production are often shackled to physical editing suites. A reliance on physical tapes means that content must be continually copied and re-ingested at each stage of production, leading to slow, linear workflows – and high costs for storage and archiving. In the analog age, these issues were acceptable inconveniences. In the world of modern media – where broadcasters must serve multiple formats and delivery channels, and where the distance between content creation and content distribution continues to shrink – yesterday's production technologies simply cannot keep pace.

At the root of all of these problems is a production workflow model based on isolated, "siloed" applications – applications hosted on dedicated servers, often supported by dedicated network infrastructures. This model provides the high performance that media production applications require – a level of performance far beyond typical IT applications. But it is also extremely costly, complex, and difficult to scale. To unlock the full potential of file-based media workflows, media companies need a new kind of technology platform to support them.

The Cisco Media Data Center

The Cisco Media Data Center (MDC) is an intelligent, video-optimized network and data center infrastructure that provides the foundation for end-to-end digital media workflows. Instead of running each application in its own silo, it provides a common high-performance, high-capacity architecture for supporting all applications, including both media and IT functions (Figure 2).

At the core of the Cisco MDC is the ability to virtualize resources across the media company – to share computational, storage, and networking resources across different business units and applications, while maintaining the appearance and functionality of physically separate systems. Instead of duplicating equipment and resources for each production and IT function (most of which are rarely used to capacity), the Cisco Media Workflow Platform enables dynamic provisioning of resources wherever and whenever they are needed. The result: improved business efficiency and resource utilization, unbounded collaboration, and lower costs.

With the Cisco MDC, broadcasters can:

Increase collaboration by breaking down the barriers between production teams and business units, and ecosystem partners, letting everyone share a common technology infrastructure and a single file-based storage system.

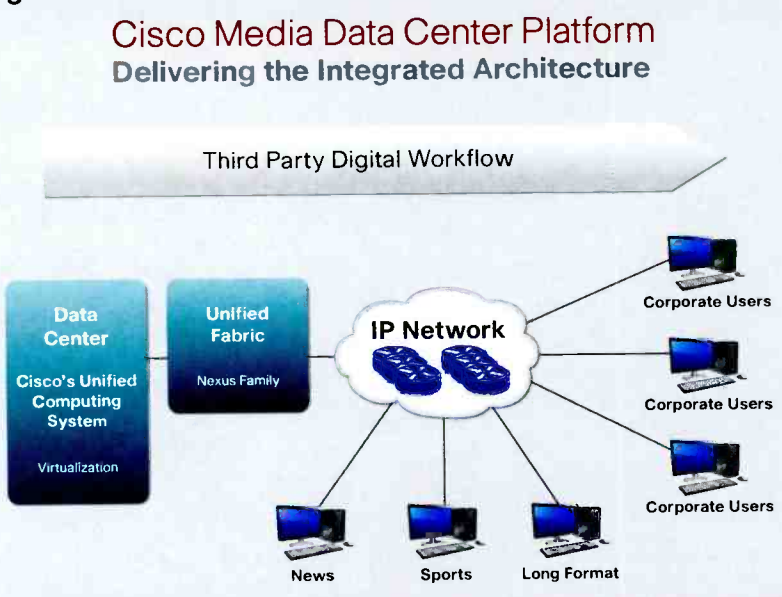
Virtualize content, applications, and resources across the organization, unleashing unprecedented flexibility while lowering equipment costs, power and cooling, and maintenance expenses.

Reduce time to air by streamlining complex production environments, optimizing slow linear workflows, and allowing instant access – from anywhere – to file-based content and archives.

Create a lossless Ethernet-based production environment that has been independently proven to deliver the performance and scalability that HD media applications demand (see the following section).

Accelerate innovation by linking content production systems directly with ecosystem partners, allowing broadcasters to reach new media distribution platforms and customers, and monetize content in new ways.

Figure 2: Integrating Production and IT Functions over a Common IP Infrastructure



Building Blocks of the Cisco MDC

The Cisco MDC is based upon the Cisco Unified Service Delivery architecture and a Cisco IP Next-Generation Network (IP NGN). This standards-based solution fully supports and integrates with a variety of leading third-party digital workflow and production applications, as well as traditional IT and data center functions.

Cisco Unified Service Delivery

The core of Cisco's data center innovation, the Cisco Unified Service Delivery architecture consists of:

Unified Fabric: The Cisco Nexus® Family of switches provides the lossless infrastructure to support all MDC services, including LAN and SAN connections, over Ethernet. This simplifies the data center to a single set of fully virtualized connections, improving resource utilization and lowering costs. The solution also integrates Cisco's MDS Family of storage products.

Cisco Unified Computing System (UCS): Cisco's groundbreaking Unified Computing System provides a fully integrated, pre-engineered solution for the MDC, unifying server, storage, and networking resources into a single system.

Virtualization: Instead of the traditional data center model – in which each application resides on its own server, often utilizing as little as 15 percent of the available hardware resources – the Cisco MDC runs applications on "virtual machines" that share a common pool of hardware. Designed in partnership with VMware, the industry leader in virtualization, the solution simplifies the management of these virtual machines and allows media companies to dramatically improve data center resource utilization and energy efficiency.

Together these solutions provide a powerful foundation for efficiently delivering content and computing resources wherever and whenever they are needed, enabling broadcasters to reap the full benefits of file-based media workflows.

Cisco IP NGN

The second element of the Cisco MDC is the Cisco IP NGN. Here, the entire range of Cisco's industry-leading routing, switching, and video products provides end-to-end delivery of IP services with advanced media-aware features. The IP NGN spans core, edge, and user equipment and provides an intelligent network that is both service- and application-aware – with industry-leading capabilities for assuring scalability and capacity for HD media applications.

Partnering with the Worldwide Leader

For broadcasters and media companies, the future has arrived, and the transition to file-based media workflows has begun in earnest. Cisco is the ideal partner for this industry evolution. Cisco uniquely provides:

A lossless Ethernet data center platform for enabling end-to-end media workflows

Total flexibility, with the ability to support any standards-based hardware and the leading media production applications

High performance, with a proven, independently tested data center infrastructure

Maximum scalability to cost-effectively support evolving HD media production environments

Industry-leading media partners that provide a complete ecosystem of data center, virtualization, and media workflow capabilities

Putting the Cisco Media Data Center to the Test

Cisco designed the Media Data Center (MDC) to provide ample capacity and scalability in lossless media production environments. But how does the architecture perform under the demanding conditions of real-world HD editing applications? Cisco asked VRT-medialab, the research and development arm of Belgian public broadcaster VRT, to find out. The independent laboratory performed a phased test of the MDC to gauge its performance.

Phase 1: Lossless Ethernet

To account for the unique requirements of media environments, any IP-based architecture must feature a storage network that provides robust parallel throughput and high capacity, scalability, redundancy, and availability. Today, many file-based media storage environments use InfiniBand storage network interfaces due to InfiniBand's high link bandwidth. With the introduction of the Cisco MDC, Cisco uses Data Center Bridging (DCB), offered in Cisco Nexus Family switches, which aims to provide lossless transport over Ethernet.

Results of Phase 1:
VRT-medialab tested Cisco Nexus 5000 Series Switches with DCB against InfiniBand in a typical media environment, using both Linux- and Windows-based storage nodes. The results were compelling: In the Linux-based cluster, the Cisco Nexus 5000 Series with DCB delivered comparable performance to InfiniBand. In the Windows cluster the switches delivered as much as five times the throughput of current state-of-the-art InfiniBand solutions.

Phase 2: Accounting for the Unique Behavior of Media Traffic

Some early attempts to transition to file-based environments have been stymied by IP networks that do not behave as expected. Even when networks ostensibly have the capacity to support media services, throughput may decrease and become unpredictable, and transfers may even be lost. The reason for this mysterious behavior is the intrinsic differences between IT and media traffic.

Where IT traffic generally consists of short messages or small files, media traffic consists of bursts of very large files (several GB), which use the link for a long period of time and almost constantly try to use 100 percent of the available bandwidth.

To account for oversubscription and packet loss, any IP-based media storage network must employ egress buffers capable of handling large, bursty media file transfers. The Cisco Nexus Family switches employed in the Cisco MDC were designed specifically to meet this requirement.

Results of Phase 2:
VRT-medialab put this architecture to the test using Avid high-resolution editing clients running multiple streams of HD video over the Cisco Nexus 7000 Series. The results were impressive as traffic passed unhindered through the Cisco Nexus 7000 Series Switch with no oversubscription, no packet loss, and no effect whatsoever on video playout.

Phase 3: MDC as an Integrated Virtual Media Environment

Having completed the first two phases, VRT-medialab is now testing the entire Cisco MDC architecture – including storage, virtualization, and the Cisco Unified Computing System.

The workflow of media production is very complex and requires integration of many different media services. Due to the heavy transport demands of media, most of the services would benefit from a physically close coupling with the clustered storage.

The optimal media workflow architecture should provide an integration of both storage and media services into a storage cluster environment based on a scalable virtual platform such as provided by the DCB-based media WARP cluster, where the Cisco MDC provides a unique solution.

The MDC setup shown in Figure 3 illustrates a complete media workflow consisting of central ingest, rewrapping, transcoding, and editing on the same central MDC storage system. It contains the following features:

Multiple OS platform, both Windows and Linux, allowing different media services to be integrated and run on the same MDC.

Complete elimination of almost all data transfers over an external IP network. This allows for lossless, extremely fast, highly efficient and reliable dataflows.

Virtualization of complete Media Asset Management (MAM) system functionality on a single virtualized MDC computing node. This allows the different media services of the workflow to run side by side on a single computing node and thereby collapse the complete dataflow into the MDC cluster network:

- Two parallel rewrapping services
- Five parallel transcoding services

Optimal utilization of the extensive memory of the UCS-C server node to enable direct internal data transport between the different virtual media services on the same node.

Editing of the high-resolution material while it resides on the same MDC storage system, completely eliminating the additional time-consuming transfers to local proprietary video storage solutions. Virtualization of these high-resolution gateways allows access for Avid and Apple high-resolution editing clients, connected through different virtual nodes on the same physical MDC computing node.

For more details about the VRT-medialab test, including specific test scenarios and configurations, see the January, February, and March issues of *Broadcast Engineering*.

A New World of Media at the Consumer's Fingertips

The The future of rich media services is here. As new delivery channels and business models proliferate, broadcasters worldwide are building IP NGN-based medianets to bring a new generation of video experiences to consumers. Cisco's Media Data Center stands at the forefront of emerging medianet technologies. But delivering and monetizing new media experiences requires more than a next-generation workflow platform. It requires an end-to-end medianet that is network-aware, media-aware, and device-aware, and extends all the way from the camera to the customer's screen.

Cisco is leading the way in medianet technologies and can offer broadcasters a true end-to-end solution. Working in concert with industry-leading media partners, Cisco provides deep expertise in IP networking, file-based workflow technologies, video transport, and intelligent solutions for the customer home. Cisco can converge all of these solutions into a single, harmonious IP architecture that extends media-aware intelligence through:

Media production with a groundbreaking Media Data Center that eliminates inefficient manual processes and helps media companies reap the benefits of file-based production workflows

Contribution solutions that combine broadcast-grade HD video transport with the flexibility, control, and cost savings of IP networks

Content distribution with an IP Next-Generation Network that can serve multiple platforms and affiliates, rapidly scale new media to a global audience, and maintain the highest quality of experience

Content consumption with revolutionary IP solutions for the consumer home that help broadcasters deliver and monetize more personal, social, and interactive media experiences

Cisco is already working with broadcasters around the globe to transition to file-based media environments and deliver the next generation of media experiences. Only Cisco can provide:

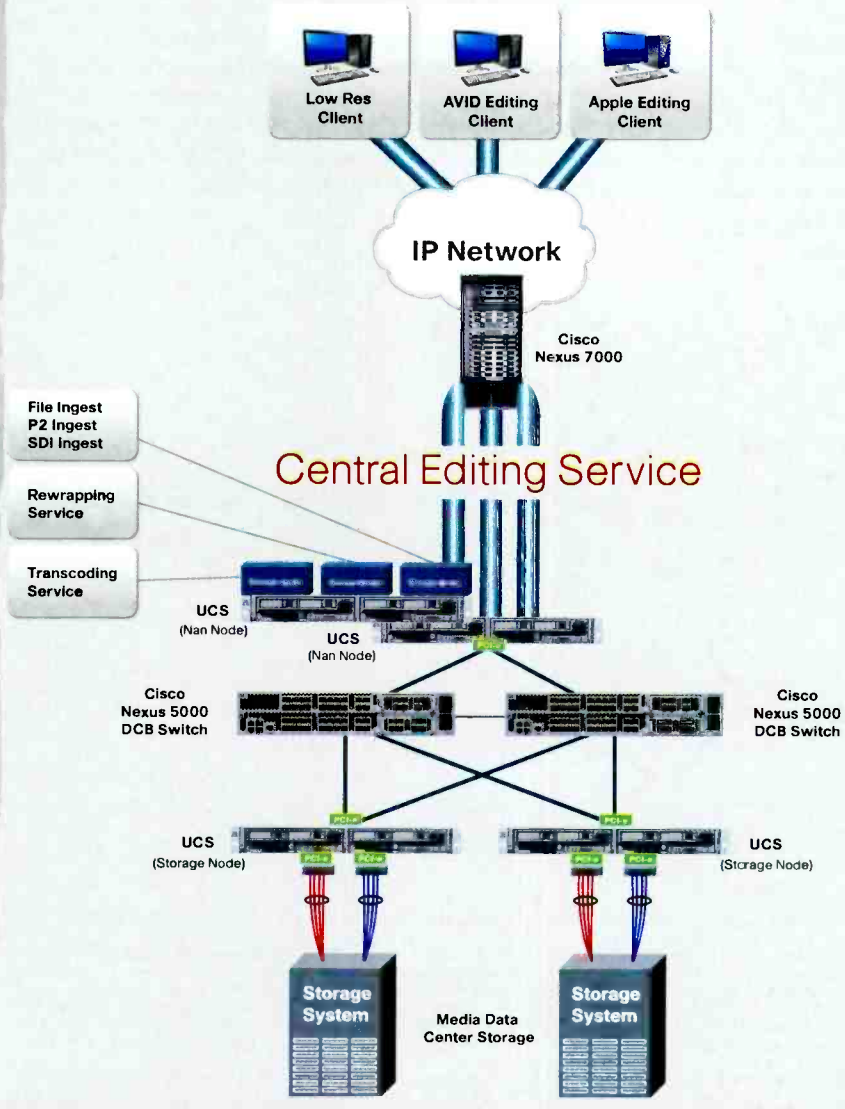
An all-Ethernet media platform that can support any standards-based technology or application

A proven data center platform that has been independently verified to meet the stringent performance and scalability requirements of HD media production

An ecosystem of industry-leading media production, virtualization, and integration partners working hand-in-hand with Cisco to deliver a complete, pre-integrated medianet solution

It's time to unleash a new world of new media experiences for your viewers. Find out how at **www.cisco.com/go/medianet**

Figure 3: Media Workflow Integration on Virtual Media Data Center



Q&A with Luc Andries of VRT-medialab

Luc Andries is a senior infrastructure architect and storage and network expert with VRT-medialab, the research and development arm of Flemish public radio and television broadcaster VRT. He presently leads the media infrastructure team at the IBCN research group at the University of Gent in close cooperation with CandIT-Media, a spin-off company of VRT-medialab specializing in media infrastructure.

What would you say to media companies facing the transition to file-based production systems?

It is important to understand that building an IP network for media is different. Applying the standards-based IT infrastructure to media introduces a number of benefits to media workflow systems, but treating networks as a commodity IP technology in a media environment is a recipe for failure. Taking into consideration the specific media requirements is key for choosing the right equipment and design.

So where should they start?

Media workflows are becoming storage-centric in nature. A high-performance central storage system platform is needed for a successful implementation of a media workflow. Once you have such a unified media data center in place, you are also able to pull media services and applications into the platform. This, along with direct connections to client workstations, simplifies the workflow. If the platform is built correctly, execution is performed in a lossless and guaranteed high-throughput environment.

How do you see the evolution of Ethernet in the data center environment?

With the advances in Ethernet speeds and the enhancements standardized by IEEE (Institute of Electrical and Electronics Engineers) with Data Center Bridging (DCB), Ethernet has become an attractive choice as the technology for convergence in the data center. Our laboratory tests clearly show that DCB provides a compelling media storage solution.

We were able to create an IP network infrastructure that was more than capable of handling media traffic flows over Ethernet, utilizing switches from the Cisco Nexus Family and the Cisco Unified Computing System. I believe that the market is ready for a move toward an all-Ethernet transport, consolidating servers and networks in a standards-based environment.

How does the Unified Computing System (UCS) come into play here?

Cisco's UCS was a natural addition to the Media Data Center environment. We are currently integrating different services such as Media Asset Management into the UCS environment. With UCS's extensive memory and virtualization capabilities, I can envision it being a central piece – serving as a home for different media applications. This will enable media companies to save hardware costs while increasing the simplicity and performance of their Media Data Center.

www.cisco.com/go/msb

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ARCHIVE SYSTEM
Front Porch Digital DIVArchive v6.3

Includes full Unicode support for storage plan manager, the component that automatically manages content lifecycle based on advanced and fully configurable business rules and policies; features DIVAprotect, which continually monitors the digital storage infrastructure, including connected broadcast devices, network connectivity and transcoder engine performance.

303-440-7930; www.fpdigital.com
Booth: N5806

SERVER
Video Technics Apella v5.1

Updates include enhanced MXF record and import features, optimized record and playback proxy desktop streaming, full VANC HD/SD up/downconversion, new mirroring services for 100 percent peer-to-peer redundancy, and an extremely large database and object browser support.

404-327-8300; www.videotechnics.com
Booth: N6812

ARCHIVE MANAGEMENT
TransMedia Dynamics i-mediaflex Pro Client

Enables users to carry out a rough-cut proxy edit on a standard browser desktop and then submit the EDL to the craft editing system such as Final Cut or Avid; will supplement workflows to support approvals for content such as promos; enables the creation and updating to be carried out within a production facility or external environment; provides a simple and intuitive user interface as well as cataloging and the use of tag clouds to enable users to efficiently and effectively catalog content from the proxy version on their Web browser desktops.

+44 1296 745080; www.tmd.tv
Booth: N3716

SYSTEM INTEGRATION
Burst

Designs, engineers and installs integrated systems for video broadcast technologies; specializes in bundled solutions as well as complex projects, from hardware and software to installation and training.

303-858-9848; www.burstvideo.com
Booth: C11126

BROADCAST STEREO HEADSET
Audio-Technica U.S. BPHS1

Offers natural, intelligible, focused vocal reproduction, closed-back circumaural ear cups to seal out background noise and a high-output dynamic microphone mounted on a flexible gooseneck boom; more sensitive to sound originating directly in front of the element to further reduce pickup of unwanted sounds.

330-686-2600; www.audio-technica.com
Booth: C1632

H.264 DECODER
HaiVision Network Video MAKITO Decoder

Supports video up to 1080p60; provides low-latency decoding and efficient delivery of HD video via HD-SDI or HDMI out; features miniblade form factor and low power requirements.

514-334-5445; www.haivision.com
Booth: SL4424

LIVE ADAPTIVE STREAMING ENCODER
Digital Rapids StreamZHD Live ABR

Encodes and streams live HD and SD content for delivery through the latest generation of adaptive bit rate delivery technologies; outputs multiple formats, resolutions and bit rates simultaneously in real time; supports Microsoft IIS Smooth Streaming, Adobe Flash Media Server Dynamic Streaming and adaptive delivery for the Apple iPhone.

905-946-9666; www.digital-rapids.com
Booth: SL6010

CHANNEL MANAGEMENT APPLICATION
Omneon ProDrive GX

Designed for users who want a more all-inclusive channel playout solution; controls server ingest and playout along with graphics events and other elements of the channel chain; combination of ProDrive GX with MediaDeck GX provides users with a complete turnkey playout solution to launch new channels cost-effectively.

408-585-5000; www.omneon.com
Booth: N5106

ENCODER
LEIGHTRONIX PEGstream-SD

Streaming encoder delivers live Web video; enables users to stream to a worldwide audience without straining internal networks; available as an add-on to the PEG Central Web video hosting and streaming VOD service; designed for integration with the company's UltraNEXUS video server and can receive commands from the TV automation controller for configuring encoding parameters on the fly, as well as restricting Web delivery of TV content.

800-243-5589; www.leightronix.com
Booth: C9015

Color indicates advertisers

ENCODER/DECODER
Ensemble Designs 7630 Dolby E Encoder and 7615 Dolby E Decoder

Used with the new Avenue 9600 audio embedder, disembedder and data inserter; 16-channel module handles both AES digital audio and analog audio; supports 3Gb/s, HD and SD video; 7615 decoder is used in conjunction with the 9600 and can be fed from either an AES input or an AES stream disembedded from the incoming SDI signal; resulting discrete surround signals are then selectable as inputs to the 16-channel mixer/shuffler.

530-478-1830
www.ensembledesigns.com
Booth: N1929

DIGITAL MEDIA TRAINING
Future Media Concepts

Digital media training center; provides manufacturer-authorized training in all areas of digital media including digital video and film editing, Web design and development, sound design, DVD authoring, 3D animation, motion graphics, desktop publishing, architectural and mechanical design and Mac IT; offers authorized training for Adobe, Apple, Autodesk, Avid, Boris FX, Digidesign, NewTek and Softimage.

212-233-3500; www.fmctraining.com
Booth: SL7706

DIGITAL PRODUCTION SWITCHER
Ross Video CrossOver

Version 2.0 feature set adds internal up/downconversion, 2-D DVEs, internal animation stores, a high-quality chroma keyer and AI Memory Recall feature.

613-652-4886; www.rossvideo.com
Booth: N3807

HD ENCODER
Grass Valley ViBE EM3000

Can now deliver HD over MPEG-2; the power of the Mustang engine enables to it deliver maximum quality at minimum bit rates and frees up capacity, allowing broadcasters to double the number of HD services available and add new capabilities such as mobile TV.

503-526-8100; www.grassvalley.com
Booth: SL106

CAMERA-TOP MONITORS
Marshall Electronics 7in XP

Lightweight, high-resolution, portable field/camera-top monitors; feature a high-resolution 800 x 480 LCD panel, manual gamma adjustment, adjustable backlight and image flip; have 1/4in-20 mounts on all sides; offer a robust power switch and an improved, more rugged front panel; include a variety of markers, including user adjustable; available with component, HDMI, and 3G-SDI.

800-800-6608; www.lcdracks.com
Booth: C8931

IP UPLINK SYSTEM
SIS LIVE uPod IP

Works seamlessly with any satellite capacity; provides high-rate broadband IP link up to 4.2Mb/s up and 18Mb/s down; available in .75m, 1m and 1.3m models; comes in carry-on trolley case.

202-686-4242; www.sislive.tv
Booth: SU1920

SOLID-STATE MEMORY
Panasonic AJ-PCD2

Single-slot P2 solid-state memory card drive; comes with two USB 2.0 cables; requires no separate power supply for file transfers; offers total compatibility with Mac and Windows desktop and laptop computers; supports all P2 card sizes, P2 formats and frame rates in HD and SD; with a 64GB P2 card inserted, the PCD2 can offer immediate access to more than four hours of DVCPRO, two hours of DVCPRO50 or AVC-Intra 50, or more than an hour of DVCPRO HD or AVC-Intra 100 content.

201-392-6141
www.panasonic.com/broadcast
Booth: C3712

RECEIVER/STREAM-PROCESSING PLATFORM
Harmonic ProView 7000

Combines a scalable video receiver, DVB descrambler, multiformat decoder and MPEG stream processor in a single-rack unit; decodes all formats and standards including MPEG-2 AVC in SD and HD; can act as a receiver to descramble and transmit DVB-S2 satellite signals.

408-542-2500; www.harmonicinc.com
Booth: SU7213

NETWORK PROBE
Tektronix IPM400A

Can monitor up to 500 IP flows and all essential parameters, including TS errors, IP packet interarrival time and MDI; ensures IP and TS integrity across a broad set of video services on even a fully loaded GigE link.

800-833-9200; www.tek.com
Booth: N2522

INTERACTIVE SIGNAGE PLATFORM
never.no DS

Enables audience participation by modifying the content stream based on live, user-submitted interactions and content; functions with most digital signage delivery and management systems and mobile platforms; powers interactive digital signage and allows viewers to participate through mobile phones and the Internet; offers Web 2.0 and social network integration, participation TV and dashboard- and subscription-based reporting.

917-680-4881; http://never.no
Booth: SL7427

INTERACTIVE TV PLAYOUT PLATFORM
Softel MediaSphere

Enables the rapid deployment of innovative interactive applications; supports all DTT, DSAT and cable interactive standards, including EBIF, tru2way, MHEG and OpenTV; provides a flexible, scalable solution, decreasing time to market and reliably playing out high volumes of interactive content.

203-354-4602; www.softelgroup.com
Booth: N2534

INTEGRATED RECEIVER DECODER
Sencore IRD3000

Supports SD applications, allowing operators to leverage their existing SD infrastructures while affording an easy upgrade path to HD for the future; provides a satellite RF or MPEGoIP combined with ASI transport stream inputs, while transport stream outputs are available on ASI and MPEGoIP for distribution to digital networks; provides high-quality MPEG-2 and H.264 SD-video formats on analog or serial digital outputs with an option to enable HD formats.

605-339-0100; www.sencore.com
Booth: SU4310

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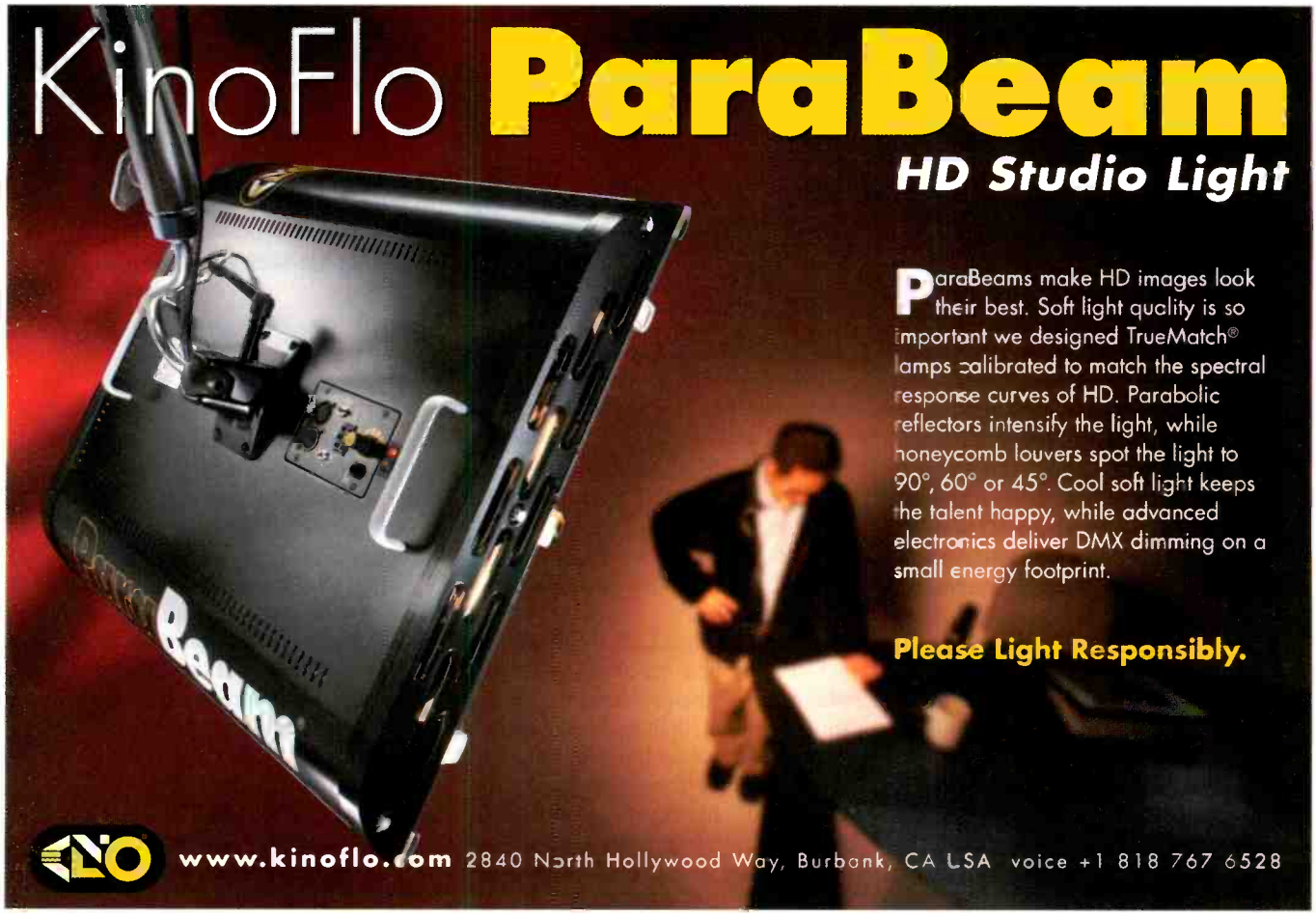


MHEG APPLICATION
Strategy & Technology
S&T Player

Designed for VOD services including catch-up TV; features flexible back-office integration using the Mediator product; offers a configurable and customizable application for browsing and navigation of content as well as playback control for hybrid broadcast/broadband platforms.

303-926-4933; www.s-and-t.com
Booth: N4016

BROADBAND VIDEO CONTRIBUTION
Streambox Streambox Live

New version enables iPhone users to upload high-quality video using the AT&T 3G network; enables broadcasters to enhance breaking news stories with ad hoc content supplied by a variety of contributors, including video journalists, stringers and citizen reporters.

206-956-0544; www.streambox.com
Booth: SU8911

ENCODER
ViewCast Niagara 7500

Simplifies the complex workflows associated with the transformation and delivery of HD video to IP and mobile networks; features a sleek, innovative touch control interface with contextual menus that streamline and simplify operation of this high-powered, dual-quad-core streaming appliance; features SD/HD-SDI video, balanced/unbalanced analog and AES/EBU digital audio, and eight stereo pairs of embedded SDI audio.

800-250-6622; www.viewcast.com
Booth: SL1709

AUDIO EMBEDDER/DE-EMBEDDER
Crystal Vision TANDEM 3G

Combined embedder/de-embedder for four groups of audio; bidirectional digital audio connections can be configured in stereo pairs as AES inputs, outputs or a mixture; motherboard can be fitted with fiber I/O; offers full shuffling and overwriting of mono channels between all four groups with 32 x 32 audio router; optional delay of 80ms compensates for any video processing and makes it easy to match all signals.

407-405-8644; www.crystalvision.tv
Booth: N820

PORTABLE LIVE PRODUCTION SYSTEM
NewTek TriCaster

Offers HD/SD live switching, HD projection, live HD streaming and network-style, live HD virtual sets in one solution; available in several models.

210-370-8220; www.newtek.com
Booth: SL10814

BIDIRECTIONAL RIBBON MICROPHONE
Audio-Technica U.S. AT4080

Achieves ribbon microphone sound while solving the problems of fragility and low output; delivers warm, smooth sound; offers robust build for long-lasting, reliable performance and higher output for maximum compatibility with microphone preamps.

330-686-2600; www.audio-technica.com
Booth: C1632

DVR
Fast Forward Video Micron HD

Designed to be a cost-effective system for record and playback; single-rack unit records HD and SD using high-quality JPEG 2000 compression at speeds of up to 100Mb/s; offers up to five hours of record time; fully compatible with the company's HD products.

949-852-8404; www.ffv.com
Booth: C8016

H.264 ENCODER
HaiVision Network Video
MAKITO Encoder

Supports both component analog and DVI inputs; delivers low-latency, full-frame-rate H.264 encoding of HD video up to 1080p60 or computer graphics up to 1280 x 1024 75Hz (SXGA); incorporates HiLo-Streaming, to encode once and emit both high- and low-bandwidth streams simultaneously, and Multi-Streaming, to send streams with different IP encapsulation to different destinations.

514-334-5445; www.haivision.com
Booth: SL4424

MULTISCREEN VIDEO DELIVERY SUITE
Harmonic MediaPrism

CLEARcut offline and LIVEcut real-time content preparation solutions enable service providers to capture and prepare assets for multiscreen viewing; ProStream 5000 transcodes up to 16 video assets simultaneously and supports the full range of codecs and formats; StreamLiner 3000 delivers thousands of streams for a variety of applications; Workflow Manager automates the flow of assets throughout the content ingest, transformation and delivery process, and can control scheduling, recording and playout.

408-542-2500; www.harmonicinc.com
Booth: SU7213

A/V RECORDER

SSL DV Gravity Studio Recorder (GSR)

Fully digital, linear audio/video recording device preserves the traditional tape workflow paradigm engineers use for near-air productions while delivering digital speed and accuracy; allows for the overwriting of previous takes with new material onto the same file; enables a recording to be paused, rewound and rerecorded multiple times without creating a new file.

212-315-1111; www.solidstatelogic.com
Booth: N808

STORAGE

Panasonic AG-MSU10

P2 media storage unit; simplifies the process of backing up or aggregating P2 content to a larger, removable solid-state drive; delivers fast, stable transfer of data; removes the need for computers or larger, more expensive appliances in the field and can quickly free up cards for additional shooting; features a small form factor with two slots: one for a P2 card and the second for the AG-MBX10 removable housing that encloses a standard 2.5in SATA solid-state drive; equipped with USB 2.0 and eSATA connectors; can be connected to PCs and Macs, including laptops.

201-392-6141
www.panasonic.com/broadcast
Booth: C3712

SMALL-DIAMETER 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 superior performance with 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
Booth: SU8823

Color indicates advertisers

NEW TAHOMA-LX Multiviewers

NABSHOW Where Content Comes to Life™

N4029

- *Built-in Routing Switchers - any input source to any Multiviewer output*
- Built-in CATx extenders (1080p @ 115 feet)
- 4 to 32 auto-detect HD / SD-SDI video inputs (3G Ready)
- 16 channels of embedded audio per video input
- 4 channels of discrete audio per video input
- Multiple outputs in DVI, HDMI or VGA
- Output resolutions up to 1920 x 1200 / 1080p / 2048 x 1080
- SDI Output
- Skin Technology for customizable user interface
- Cost-effective solution with 3-year warranty
- 18 models available - 1 RU and 3 RU (depending on model)

NEW TAHOMA-LI Multiviewers

- *Looping Video Inputs - for further distribution or duplication of inputs - including 3G up to 140 meters*
- Built-in CATx extenders (1080p @ 115 feet)
- 4 to 16 auto-detect HD / SD-SDI video inputs (3G Ready)
- 4 to 16 auto-detect PAL / NTSC Composite video inputs
- 16 channels of embedded audio per video input
- 4 channels of discrete audio per video input
- Multiple outputs in DVI, HDMI or VGA
- Output resolutions up to 1920 x 1200 / 1080p / 2048 x 1080
- SDI Output
- Skin Technology for customizable user interface
- Cost-effective solution with 3-year warranty
- 12 models available - 1 RU and 2 RU (depending on model)

www.apantac.com
+1 503 616 3711 • info@apantac.com

APANTAC

Color indicates advertisers

SNG SYSTEM
On Call Communications
QuickSPOT 96cm Fly and Drive

Antennas pack up in cases for transport and assemble in minutes without tools; includes everything required for assembly as a vehicle-mount antenna or pedestal-mount design; delivers high-quality content in HD or SD with up to 9.9Mb/s uplink speeds; features IFBcompatible phone lines and Internet access; modular architecture allows for the integration of additional IP-based components and accommodates future upgrades.

949-707-4729; www.occsat.com
Booth: OE910

SOFTWARE ENCODER
Streambox ACT-L3

Supports high-quality HD-SDI video streaming via Apple Mac OS X platforms; enables field news teams using Mac laptops to gather, edit and stream live or file-based HD-SDI video over IP networks from remote locations; capable of encoding 1080i HD video at up to 6Mb/s (depending on the Mac's processing power).

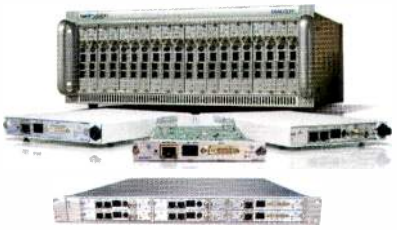
206-956-0544; www.streambox.com
Booth: SU8911

MULTIVIEWERS
Apantac Tahoma-LX

Series auto-detects HD/SD-SDI inputs and offers flexible outputs that are user-selectable at resolutions up to 2048 x 1080, including 1080p; each module supports up to 30 presets for straightforward display layout, which can be recalled via GPI, front-panel buttons or ASCII protocol; integrated architecture provides advanced flexibility for visually monitoring signals.

503-616-3711; www.apantac.com
Booth: N4029

HIGH-DENSITY CHASSIS
HaiVision Network Video MB6



Holds up to six MAKITO or BARRACUDA encoders in a single 1-7/8in rack unit; hot-swappable design allows for various chassis configurations with any combination of MAKITO encoders/decoders or BARRACUDA encoders to meet any video distribution needs.

514-334-5445; www.haivision.com
Booth: SL4424

MODULATOR
Sencore SMD 989 DVB-S2

Provides satellite video delivery multistream capability; accepts transport streams via DVB-ASI or IP inputs using the UDP or RTP protocols; features optional agile L-band upconverter with an output frequency range of 950MHz to 2150MHz; sustains all modulation formats defined in the DVB-S2 standard; offers optional multistream inputs along with an agile RF upconverter.

605-339-0100; www.sencore.com
Booth: SU4310

ON-SET VIDEO PLAYER
Alcorn McBride SetPlayer HD

Provides eight channels of on-demand, flash-based video to multiple monitors in a compact package; stores video clips on CompactFlash; features component, HDMI, HD-SDI outputs, SD monitor outputs for each channel and unbalanced, balanced and digital AES/EBU audio inputs; accepts black burst, composite and trilevel sync reference inputs; stereo and Dolby audio can be multiplexed with the video and output as digital bit streams; responds to contact closures, RS-232/RS-422, MIDI and Ethernet; can be controlled by existing transport controllers via VDCP.

407-296-5800; www.alcorn.com
Booth: SL2605

QUALITY CONTROL MODULE
Harmonic Rhozet
Carbon QC 1.0

Fits directly into transcoding workflow; reduces manual intervention; analyzes both incoming and outgoing assets during transcoding; can be configured to check video and audio characteristics including black detection, silence detection, audio levels, letterboxing, blockiness, bit rate, duration and transport stream compliance; can provide an automated visual comparison between input and output data to guarantee visual quality of the output.

408-542-2500; www.harmonicinc.com
Booth: SU7213

CONVERSION CARD
Cobalt Digital Fusion-3G 9900 series LINK3G

Provides high-density conversion between dual-link and single-link in the openGear frame; features six SDI inputs and four SDI outputs; provides combinations of dual-to-single and single-to-dual conversions allowing for up to 30 dual-to-single conversions or 20 single-to-dual conversions in a 2RU frame.

217-344-1243; www.cobaltdigital.com
Booth: N2830

MOUNTING SOLUTION
Mode-AL Speed Rack 19

Enables users to mount 19in rack equipment via NIRA (Non-Inverting Right Angle) adaptor onto a 19in rack cabinet; any 19in rack with bolt-on rack strips can be changed over to this solution by unbolting the strip and replacing it with the Speed Rack equivalent; enables designers to place equipment in the optimum location and have the confidence that no additional supports or brackets will be needed, enabling faster design and tighter cost control.

800-306-0620; www.mode-al.com
Booth: C3846

MULTIVIEWER SYSTEM
Miranda Technologies Kaleido-Modular

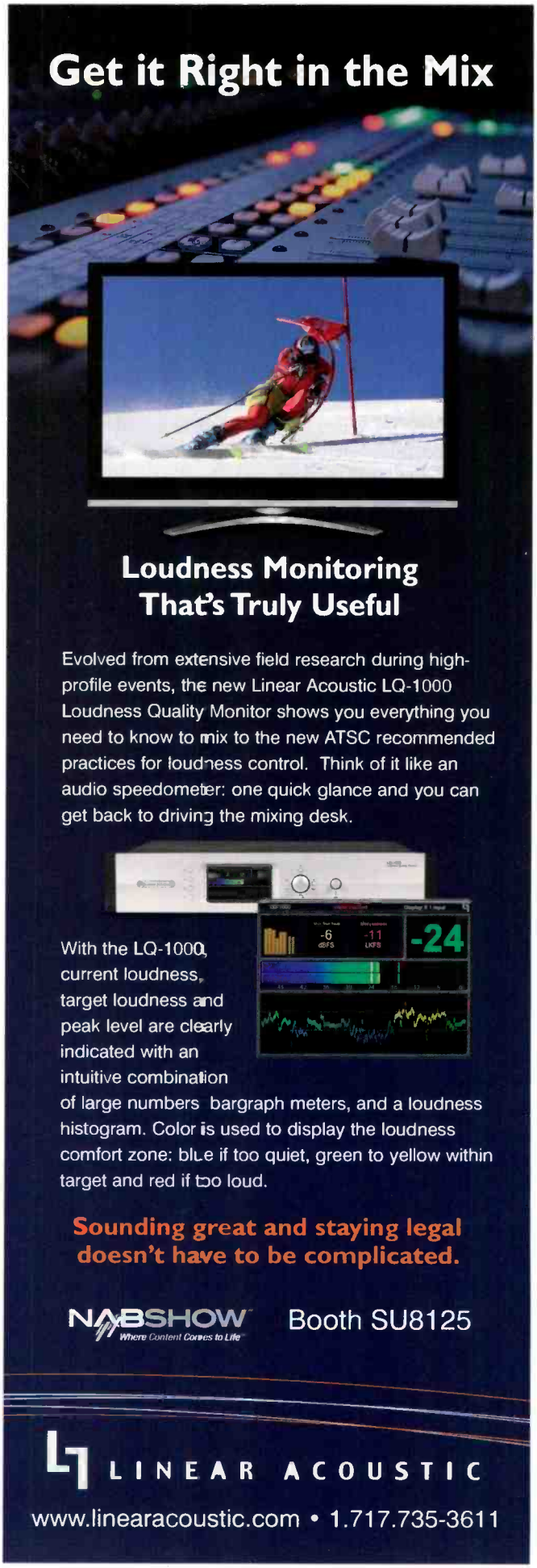
Features up to 20 multiviewer outputs per 3RU frame, consuming less than 300W in total; each card provides eight 3Gb/s HD/SD video inputs (with stereoscopic 3-D support) and two multiviewer outputs; up to 10 multiviewers can be housed in a 3RU Densité 3 frame, which weighs just 19lbs when fully populated; ideal for OB trucks.

514-333-1772; www.miranda.com
Booth: N2515

SAFE AREA GENERATOR
Eyeheight safeEyesFC

Safe-area generator and image measurement module; provides an extensive range of broadcast safe-area markers and pixel-accurate text height measurement for commercials compliance.

623-328-5800; www.eyeheight.com
Booth: N4019



Color indicates advertisers

LCD MONITORS
PENTA HD2line PRO

Suitable for reference and mastering applications such as studio production, OB vans, master control, post production, high-end editing, telecine and quality control; all displays feature DVI-I, VGA and CVBS inputs as standard; a multiformat HD/SD-SDI input supports data rates up to 3Gb/s and is available as an option; the latest addition is a fiber-optic input module, available also as an option; the SDI board automatically recognizes the format of the incoming signal and displays it accordingly or in line with the settings for that specific format.

936-828-6830; www.penta-web.com
Booth: N1023

3G-SDI PROCESSOR
TV One C2-6204

Has four 3G-SDI inputs plus a DVI-I input to place up to four windows on a single DVI-I/3G-SDI output; each window is powered by a CORIO2 scaler; supports 3G-SDI resolutions up to 1080p60; high-performance deinterlacing with motion-adaptive noise reduction is available for interlaced SDI and YPbPr sources; provides DVI-I output and duplicate 3G-SDI capable output and audio metering capability from embedded audio on the video sources.

800-721-4044; www.tvone.com
Booth: C3943

WAVEFORM MONITORS
Marshall Electronics Full Resolution Dual Link/ Waveform Monitors

Available in different sizes; feature two 3G-SDI inputs with loop-through and SD-SDI, HD-SDI, and 3G-SDI support; one DVI-D input supports digital DVI, HDMI (without audio), analog video (RGB, YPbPr) to 162MHz; offer a 10-bit image processor, 4:3 and 16:9 aspect ratios and high-quality motion adaptive deinterlacer.

800-800-6608; www.lcdracks.com
Booth: C8931

PORTABLE SD/HD ENCODER
Streambox SBT3-9550

Offers both high-quality SD or HD in a fully portable form factor for live or file-based video acquisition; ideal for field newsgathering and other mobile applications; offers the ability to transport full-resolution HD video at speeds up to 20Mb/s; can be easily transported in a backpack and deployed in minutes; intuitive touch-screen interface allows users to connect quickly and easily via dual Ethernet as well as Wi-Fi platforms such as 3G/4G mobile broadband devices.

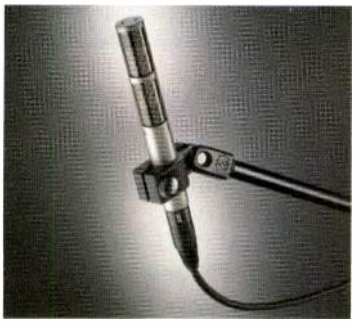
206-956-0544; www.streambox.com
Booth: SU8911

CONVERTER
Atlona Technologies DP400

Converts DVI dual-link video signals to MDP; can render a pixel-to-pixel image on MDP displays; DVI-based Mac users can use their cinema displays as their preview monitor; powered by a USB 7in pigtail connected to the unit itself; features a DVI-D 7in pigtail, allowing users to quickly connect to DVI-based computers and laptops; specifically designed to work with iMac 27in and larger displays that support resolutions up to 2560 x 1600.

877-536-3976; www.atlona.com
Booth: SL9607

BIDIRECTIONAL RIBBON MICROPHONE
Audio-Technica AT4081



Offers a robust build for long-lasting performance and higher output for maximum compatibility with microphone preamplifiers; features low-profile stick design, high-fidelity sound, dual-ribbon design, MicroLinear ribbon imprint, N50 neodymium magnets and durable performance.

330-686-2600; www.audio-technica.com
Booth: C1632

3-D SERVER SOFTWARE
Grass Valley ChannelFlex

With a simple software upgrade, enables all Grass Valley K2 Summit production clients and K2 Solo HD/SD servers to be used as a 3-D production server for 3-D recording or replay, a 2X or 3X Super Slo-Mo recording device, or as a server for recording from two to six simultaneous camera angles with at least one channel for playback; an ideal bridge from HD to 3-D production.

503-526-8100; www.grassvalley.com
Booth: SL106

MULTIFORMAT, MULTIPURPOSE CONVERTER
Brick House Video Proteus

Based on an advanced Motion Adaptive Standards Converter; offers full format conversion, frame synchronizing, TBC, video and audio proc amps, audio delay, aspect ratio conversion and bidirectional standards conversion; addresses lip-sync errors with an optional audio delay featuring both tracking and block delay.

203-376-3372
www.brickhousevideo.com
Booth: N4019

VIDEO LEGALIZER
Eyeheight legalEyesFC

Video legalizer plug-in; offers composite, RGB and simultaneous composite-plus-RGB legalization, all with user-adjustable soft clipping; supports PAL and NTSC composite domains, variable setup in NTSC, and the company's proprietary advanced nonlinear predictive filtering process, which reduces the risks of content rejection.

623-328-5800; www.eyeheight.com
Booth: N4019

CONVERTER
Ensemble Designs BrightEye 72

An affordable off-the-shelf unit for high-end broadcast applications; accepts SD, HD or 3Gb/s video in and provides an HDMI output; the additional on-screen items make it useful in a broadcast facility; in addition to the video output, it also displays open captions, allowing broadcasters to verify 608 or 708 closed-caption content; time code burn-in is provided; audio VU meters display four groups of embedded audio; Active Format Descriptor (AFD) presence is also indicated on-screen.

530-478-1830
www.ensembledesigns.com
Booth: N1929

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MULTIPATH VIDEO CONVERTER/ FRAME SYNC/DECODER
Evertz HD2014

Integrates four independent paths of video processing, which can be fed from four different input signals; each processing path includes full frame sync and up/down/crossconversion capabilities in addition to noise reduction, video proc and video enhancement capabilities; optional MPEG-2 and H.264 flex modules accept ASI input signals and generate decoded baseband video that can then be sent to conversion engines.

905-335-3700; www.evertz.com
Booth: N1602

SNG SYSTEM
On Call Communications QuickSPOT 1.2m

Automated operation sets the antenna up in about five minutes; can be integrated into midsize SUVs, vans or added to existing ENG vehicles; delivers high-quality video and audio at bandwidth rates as low as 2Mb/s for SD and 6.5Mb/s in HD; can deliver up to 9.98Mb/s uplink data rates; includes mobile office features such as IFB-compatible phone lines and Internet access; modular architecture allows for the integration of additional IP-based components and accommodates future upgrades.

949-707-4729; www.occsat.com
Booth: OE910

VIDEO SYNCHRONIZER, EMBEDDER/DE-EMBEDDER
Crystal Vision SYNNER-E 3G

Can synchronize incoming video signals not locked to the local reference and compensate for timing delays within the video system; includes full horizontal and vertical timing adjustment, crosslocking and fast locking after an upstream switch; motherboard can be fitted with fiber I/O; features bidirectional digital audio I/O; up to eight channels of external AES or Dolby E can be embedded or de-embedded in any combination.

407-405-8644; www.crystalvision.tv
Booth: N820

3G SDI A/V CONVERTER
TV One C2-2375A

Provides high-quality, bidirectional conversion between a variety of analog and digital video formats; features include up/down/crossconversion; I/Os can be SD/HD/3G-SDI, DVI, composite video, YC, YUV, YPbPr or RGB.

800-721-4044; www.tvone.com
Booth: C3943

REMOTE MONITORING
Bridge Technologies microVB

Enables IPTV operators to gather data about the performance at the viewers' set-top box, using a cost-effective, user-installed monitoring device; now available with a traffic module option that provides real-time sniffing capability and comprehensive view of traffic, in addition to video at the subscriber premises, to provide remote identification of all types of traffic that may be affecting video service quality.

+47 22 38 51 00; www.bridgetech.tv
Booth: SU4310

MODULAR RECEIVER DECODER
Sencore Atlas 3187B

Features SCTE-35-104 message conversion for commercial insertion applications, DVB-Common Interface for conditional-access decryption, multiservice descrambling, and advanced DVB-S2 capabilities such as 16ASPK and VCM support; a new 8716 four-port satellite input card supports DVB-S and DVB-S2 demodulation but also includes additional support for the modular receiver decoder's advanced features.

605-339-0100; www.sencore.com
Booth: SU4310

SNG UPLINK SYSTEM
SIS LIVE uPod Micro

Available in .75m antenna, 1m antenna and 1.3m antenna models for full-bandwidth broadcast applications and IP; enables broadcasters to provide live HD/SD coverage on demand; packaged in carry-on trolley case weighing less than 50lbs; combines SNG technology with an integrated bookings process for optimum satellite bandwidth optimization; features single-button control and built-in GPS to lock onto any fixed or inclined satellites to ensure fully automated acquisition.

202-686-4242; www.sislive.tv
Booth: SU1920

TRANSCODING TECHNOLOGY
Harmonic ACE

Extends the functionality of ProStream 1000 stream-processing platform; supports MPEG-2 and MPEG-4 AVC transcoding of up to 20 HD or 80 SD video and audio channels in a 1RU chassis; enables operators to create multiple versions of video from the same input source.

408-542-2500; www.harmonicinc.com
Booth: SU7213

CONVERTER/SYNCHRONIZER
Harris X50

Converter/synchronizer is a cost-effective, single-channel platform that delivers the quality and functionality of a1RU processor; includes integrated color correction as standard and optional 3Gb/s and fiber-optic I/O in an energy-efficient package; other features include up-, down- and crossconversion, eight analog and four AES inputs and outputs, 16 channels of embedded audio processing, control and monitoring via a built-in Web server, support for AFD and two fully controllable aspect ratio converters; can be incorporated easily into the workflow of any broadcast environment.

800-231-9673
www.broadcast.harris.com
Booth: N2502

SLOW-MOTION REPLAY SYSTEM
NewTek 3PLAY

Delivers synchronized, continuous recording and display of up to three video streams; connects to any switcher and supports the output of either a single stream or all three streams to the switcher; replays are easily organized in separate lists using color-coding to distinguish teams, players, games periods, event types and highlights; supports 16:9 or 4:3 aspect ratios.

210-370-8220; www.newtek.com
Booth: SL10814

CONVERTERS/EXTENDERS
PESA VidBlox series

Designed for transport of high-speed digital formats supporting pixel resolutions up to 2560 x 1600 at 60Hz over a single coax or fiber-optic transports; the dual-link DVI converter/extenders feature 3G-SDI technology; VidBlox-TX series provide high-end signal conversion of dual-link DVI, VGA or component video to HD-SDI/3G-SDI; the VidBlox-RX series converts HD-SDI, dual-link HD-SDI or 3G-SDI to dual-link DVI, VGA, RGB, or component video formats; each module can work independently for stand-alone applications, or multiple modules can be configured into a system for routing high-end computer graphics in I/O configurations up to 1024 x 1024.

800-323-7372; www.pesa.com
Booth: N4123

NAB 2010 NEW PRODUCT EXPOSITION

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FIBER-OPTIC TRANSMITTER/ RECEIVER

Crystal Vision FTX 3G/FRX 3G

Dual-channel boards; FTX 3G transmitter has two independent 3Gb/s, HD or SD inputs, each with one optical output; can transmit a serial digital signal down a fiber-optic cable to the FRX 3G receiver, which offers two optical inputs and two reclocked 3Gb/s, HD or SD outputs per channel; both meet SMPTE 297-2006 short-haul specification.

407-405-8644; www.crystalvision.tv
Booth: N820

SD AND HD RESTORATION SYSTEM

Snell Archangel Ph.C - HD

Sophisticated yet cost-effective real-time video restoration system ensures the quality of HD and SD content, enabling content owners to unlock the value of their assets; robust feature set includes real-time dirt, dust, grain, noise, scratch, instability and flicker removal; combines proven Snell process performance, image quality and reliability in a compact 3RU design.

818-556-2616; www.snellgroup.com
Booth: N1820

CONVERSION CARD

Cobalt Digital Fusion-3G 9900 series SBS3D

Combines dual discrete stereoscopic SDI feeds into a single SDI signal, in either a side-by-side or checkerboard pattern; can reverse the process for QC; accepts 3G, HD or SD input signals; features six SDI inputs and four SDI outputs; can process up to three different channel pairs at one time, and up to 30 channels in one 2RU frame.

217-344-1243; www.cobaltdigital.com
Booth: N2830

PORTABLE FLYPACK SYSTEM

Bexel Hercules

Designed to meet the demand for HD production facilities in hard-to-access production spaces for sports, entertainment and reality TV; features lightweight HD technology, an LCD monitor wall, working positions incorporated into custom equipment racks and optimized rack design and mechanics; can be set up quickly, is flexible and can handle many different types of production requirements.

818-388-9919; www.bexel.com
Booth: C6419

UHF ANTENNA

Jampro UHF Superturnstile Antenna

UHF Superturnstile Batwing Band IV/V 470Mhz–860MHz antenna; accommodates NTSC and CCIR channels; features hot-dip galvanized structure for long life and reliable contact at important carrying points; high strength beryllium copper with soldered brass terminal material is used for fanner straps, and all connections are bolted; directional batwings are available as a custom feature, and batwing reharness kits are optional; the antenna is completely assembled, tuned and tested before shipping, and comes with a two-year warranty.

916-383-1177; www.jampro.com
Booth: C2607

ENCODING/TRANSCODING PLATFORM

Harmonic Electra 8000

Supports MPEG-4 AVC and MPEG-2 codecs in SD and HD, up to 1080p 50/60; can be used to receive AVC content and re-encode in MPEG-2; enables users to deploy SD MPEG-2 services today, and then seamlessly transition to HD AVC.

408-542-2500; www.harmonicinc.com
Booth: SU7213

UP/CROSSCONVERTER

Brick House Video Syntax

Features an onboard Web server and Ethernet port for remote control; enhancements include analog video inputs and 3G capability; based on Super-Resolution Bandlet Technology; incorporates comprehensive audio facilities; offers upconversion and crossconversion with SDI I/O, analog inputs, noise reduction and ARC facilities.

203-376-3372
www.brickhousevideo.com
Booth: N4019

STEREO CONDENSER MICROPHONE

Audio-Technica AT4050ST

Side-address condenser with cardioids and figure-of-eight elements configured in a midside arrangement allow users to select left-right stereo output or discrete midside signals for later manipulation; dual-diaphragm capsules maintain precise polar pattern definition across the full frequency range; transformerless circuitry virtually eliminates low-frequency distortion.

330-686-2600; www.audio-technica.com
Booth: C1632

MONITORING SYSTEM
Bridge Technologies
VideoBRIDGE v4.2

Enhancements include new capabilities for fault-tracking, a revised and improved interface, and increased integration between microVB devices deployed at subscriber premises and the server network; offers extended TR 101 290 analysis capability and searchable table decoding of all tables that are transmitted with the signal, including channel names, conditional access and program guide; users can search by service name or program ID and show all the tables that correspond.

+47 22 38 51 00; www.bridgetech.tv
Booth: SU4310

PORTABLE HOUSING
Nevion FlashCase

Portable enclosure for up to five Flashlink modules; now features specialized backplanes that simplify deployment for specific purposes; can be easily configured for different applications such as video trunking, stage box, outside broadcast fiber extension, studio or event relay box, and video/audio/data transport.

805-247-8560; www.nevion.com
Booth: N4624

SET-TOP BOX
HaiVision Network
Videc STINGRAY

Supports core features of InStream player to enable intuitive, convenient video playout on large-screen displays; provides HDMI in addition to component analog (Y, Pb, Pr) and composite outputs; equipped with dual Ethernet network interfaces to offer enhanced support for streaming and data networking; fully integrated with Video Furnace System 5.5.

514-334-5445; www.haivision.com
Booth: SL4424

> True Broadcast analog or digital genlock (ITU, SMPTE)
> Real time conversion and high performance image processing
> Zoom up to 1000% and easy to use new zoom finder
> Audio embedder
> Computer Input format memory (up to 16 presets)
> SDI connections, HD format delivery or standard conversion
> 8 Preset Memories (Unlimited by RCS)
> Three year warranty on parts and labor back to factory

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Phone: +1 212 269 1902

ANALOG WAY

Email : salesusa@analogway.com
www.analogway.com

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FLYAWAY KIT
SIS LIVE RouteCase

Supports production needs of live event staging, sporting events and newsgathering; can handle asynchronous inputs in a mixed-format environment with simultaneous SDI and analog outputs for streaming and uplinks; incorporates a wireless camera link and quad-split monitoring; offers three full channels of A/V processing with mains/battery operation, talkback and remote control.

202-686-4242; www.sislive.tv
Booth: SU1920

UP/DOWN/CROSSCONVERTER
Crystal Vision Up-Down 3G

Allows flexible up/down/crossconversion between 3Gb/s, HD and SD sources; includes aspect ratio conversion, AFD insertion, signal probe functionality and integrated fiber I/O connectivity; offers signal-processing options including short-delay downconversion, motion-adaptive video deinterlacing up/down/crossconversion or matching delay; provides main and secondary outputs; can pass four groups of audio, de-embedding the four groups and converting them to the appropriate format before re-embedding them.

407-405-8644; www.crystalvision.tv
Booth: N820

T&M DEVICE
Harris Videotek VMM-4SNY

Test and measurement device for Sony LCD monitors; provides a cost-effective alternative to test equipment housed in separate rackmount units; offers HD/SD-SDI capabilities and optional 3G-SDI; enables waveform, vector, gamut, timing, picture, alarms or audio to be viewed in a quadrant or as individual full-screen displays and can meter 16 channels of embedded audio; functional control is enabled through a standard Ethernet connection via a Web browser or an optional remote control panel (RCU-CMS).

800-231-9673
www.broadcast.harris.com
Booth: N2502

HANDHELD TEST INSTRUMENTS
Anritsu Spectrum Master MS2712E/MS2713E

Eliminate multiple test sets; can be configured to include two-port transmission measurements, spectrum analysis, interference analyzer, channel scanner, gated sweep, CW signal processor and power meter; a GPS receiver can be added to both models; feature AM/FM/PM analysis capabilities.

408-778-2000; www.us.anritsu.com
Booth: C560

UHF BANDPASS FILTERS
ERI CF535/536

Tunable four-section and six-section bandpass filters for low-power digital TV applications up to 250W; the filter design is suitable for any Band IV/V application to 862MHz; can be tuned to any 6MHz, 7MHz or 8 MHz UHF channel; feature low insertion loss for a compact filter.

877-374-5463; www.eriinc.com
Booth: C2032

AUDIO LOUDNESS PROCESSING
Cobalt Digital 9085

Offers both 5.1-channel and stereo loudness processors using inputs from any source received by the card, or any mixing setting produced by the card; AEROMAX algorithms use a multiband approach to loudness processing and can apply multifaceted loudness correction specifically targeted to various frequency ranges and other characteristics within the program material.

217-344-1243; www.cobaltdigital.com
Booth: N2830

AUDIO LOUDNESS CONTROL SOFTWARE
VidCheck VidChecker

Checks audio and video quality parameters of media files and dynamically corrects audio that exceeds given loudness and peak levels; can intelligently correct video problems using new algorithms and correct limit violations while maintaining the integrity and quality of the picture; available as VidChecker Spot for commercial advertisements and VidChecker Pro for longer program content.

+44 7502 470565; www.vidcheck.com
Booth: N4019

FIBER-OPTIC ROUTER
PESA Cheetah-3

Compact 3G-SDI fiber-optic router; 144 x 144 in only 4R; sizes start at 36 x 36 with the flexibility to expand up to 144 x 144 without the need for additional rack space or power supplies; a fully loaded frame consumes a maximum of 300W; systems can be set up to support a wide range of digital transports including SMPTE 259M, 292M and 424M; supports transport of 3D-HD using two parallel HD-SDI paths.

800-323-7372; www.pesa.com
Booth: N4123

MULTIPLEXER
Rohde & Schwarz R&S AEM100

Enables network operators to expand their existing ATSC transmitter networks for ATSC Mobile DTV; uses error-protection technique to ensure interference-free reception and generates the required robust transport stream, which is output via ASI or Ethernet; comes with single-frequency network already integrated.

410-910-7800
www.rsa.rohde-schwarz.com
Booth: SU3717

VIDEO TEST CLIPS
TestVid Tvids

Filmed, edited and documented for the sole purpose of evaluating video encoders; designed to stress encoders in many ways by providing "difficult" video; comprises 18 hours/4TB of clips; provided in HD resolutions of 1080p, 1080i and 720p; 80 x 60 and Web sizes up to NTSC/D1 PAL; 10-, 12- and 14-bit; 4:2:2 and 4:4:4 video; and 2K and 4K D-Cinema sizes; accompanied by audio.

+44 7502 470565; www.vidcheck.com
Booth: N4019

MONITORING/LOGGING SOLUTION
Volicon Observer

Includes a new intuitive user interface supporting both the Windows and Mac operating systems; integrated export functionality to H.264, Flash, or MPEG-4; and new powerful search and scheduled recording capabilities; captures, stores and indexes broadcast content from multiple channels, offering users simultaneous, 24/7 access to video from their desktop computers; allows users to efficiently monitor and troubleshoot transmissions, ensure compliance, verify advertising broadcasts, and track and analyze viewer ratings.

781-221-7400; www.volicon.com
Booth: SU5302

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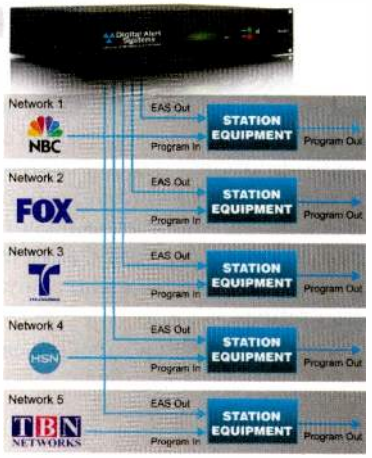
MULTISTATION EMERGENCY ALERT SYSTEM
Digital Alert Systems DASDEC-IR



Offers a single platform for distributing and monitoring EAS messages on up to five stations; eliminates the need for an encoder/decoder set dedicated to each station; helps broadcasters conserve resources while ensuring equipment upgrades and regulation compliance are more simple and efficient; combines DASDEC-II systems with MultiStation software to support simultaneous or sequential forwarding of emergency alerts to all channels; each location can process alerts independently if the connection to the central host system is lost or broken.

585-765-2254
www.digitalalertsystems.com
Booth: C3651

SATELLITE BOOKING SYSTEM
SIS LIVE uBook

Works seamlessly with any satellite capacity; uses Web portal that enables broadcasters to easily provide live coverage and monitor transmissions; provides access to both uplink and downlink sites for control, maintenance and diagnostics; features user flexibility and control of uPods to ensure client data security; allows existing client scheduling packages to control uPods directly or remotely.

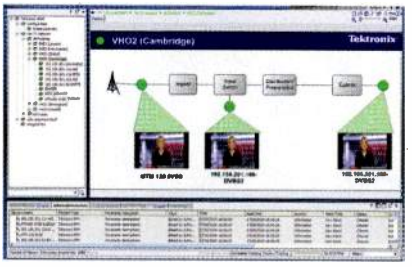
202-686-4242; www.sislive.tv
Booth: SU1920

DUAL LINK TO SINGLE LINK CONVERTERS
Crystal Vision Dual DL-3G/Dual 3G-DL

Interface between 1080p dual-link and 3G equipment; Dual 3G-DL converts a signal on a single 3GHz link to dual 1.5GHz links; Dual DL-3G converts a signal on dual 1.5Hz links to a single 3GHz link; allow two 3-D images to be combined on a single line using Level B processing; can pass two different HD signals on a single 3G signal and split them into two separate HD signals again; can interface between dual-link input 3-D mixers and two linked cameras.

407-405-8644; www.crystalvision.tv
Booth: N820

VIDEO SERVICE ASSURANCE MANAGER
Tektronix VQNet



Enables operators to detect and resolve customer-impacting problems across their IP networks; provides views across entire facilities and networks; can be incorporated into existing workflows; features an intuitive user interface that displays warnings and alarms when it detects errors impacting customer viewing quality; the software can display video thumbnails from multiple points in the network and can backhaul video and audio content from any probe in the network.

800-833-9200; www.tek.com
Booth: N2522

VIDEO PROCESSOR
TV One C2-6104A

Features four DVI-U inputs to place up to four windows on a single DVI-U output and a fifth DVI-U input for background or cascading units; each window is powered by a CORIO2 scaler; supports DVI-U resolutions up to 1920 x 1200 at 60Hz and 1080p as well as analog DVI-A (RGBH/YUV/YPbPr via optional adapter) resolutions up to 2048 x 2048; accommodates virtually any computer signal format.

800-721-4044; www.tvone.com
Booth: C3943

MONITORING CARD FOR VIDEOBRIDGE
Bridge Tecnologies VB262

In combination with the VB220 controller, the VB262 is ideal for hybrid networks where IP is used as a carrier from the headend to the regional edge-multiplexer/modulator/transmitter; built-in, round-robin functionality allows sequential analysis of multiple QAM or 8VSB multiplexes, making it possible to monitor the total broadcast contents of a cable transmission system using a single VB262; one or two modules can be specified in a chassis, allowing high-density monitoring of up to 180 MPTS/SPTS multicasts in addition to the RF inputs.

+47 22 38 51 00; www.bridgetech.tv
Booth: SU4310

VHF AND UHF ANTENNAS
ERI MANTIS series

Coaxial slotted array designs that are suitable for low and medium power digital and analog television and mobile media applications; both the VHF and UHF versions are available as horizontally, elliptically, or circularly polarized antennas; suited to mobile media requirements, as they are FCC Part 27 compliant.

877-374-5463; www.eriinc.com
Booth: C2032

HANDHELD CABLE/ANTENNA ANALYZERS

Anritsu Site Master S332E/S362E

Allow users to easily, accurately conduct return loss, VSWR, cable loss and distance-to-fault measurements in the field; include one-port phase and Smith chart measurements; two-port transmission measurement option includes two power levels and access to a built-in 32V bias tree; feature AM/FM/PM analysis capabilities.

408-778-2000; www.us.anritsu.com
Booth: C560

DTV TS MONITOR

Triveni Digital StreamScope MT-40

In addition to audio monitoring capabilities like dialnorm, now, with this new software release, users can also monitor audio loudness (also known as CALM) according to ITU-R Recommendation BS.1770 (as required by A/85).

609-716-3500; www.trivenidigital.com
Booth: SU3202

WEATHER ALERT SYSTEM

Weather Central LIVE:Wire

Delivers a comprehensive set of alerting features to ensure viewers' lives and property are protected when weather threatens; driven by viewer feedback and market research; provides clear information about the weather threat, ensuring the most critical information is displayed instantly; new features include enhanced workflow efficiency through advanced integration with other production systems and Web tools; a new Mobile Alert component automatically delivers instant alerts to viewers' mobile devices.

608-274-5789; www.weathercentral.tv
Booth: SU912

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Does your SDI to HDMI converter do this?

- Support any SDI video format up to 3Gbit (1080p)?
- Display Timecode and indicate Metadata presence?
- Provide fiber options to receive and transmit SDI streams?
- Provide access to all 16 channels of embedded audio?
- Provide an AES output which can also pass through DolbyE?
- Provide balanced or line level stereo analog audio outputs?
- Provide video and audio presence indication?

Image showing timecode and metadata overlay mode. G1-G4 indicate AES audio presence, WSS,VI, AFD and CC are present when highlighted.

ours does...

Introducing the **CDH 1811 yellobrik** from LYNX Technik. Simply the most versatile **SDI to HDMI converter** "brick" available today. From viewing an SDI signal on an HDMI display, to an integrated SDI fiber transmission system with HDMI confidence monitoring on both ends.

- the possibilities are endless -

$735
(not incl. fiber option)

LYNXTechnik AG
Broadcast Television Equipment

yellobrik™
Just the first of many..

NABSHOW
Where Content Comes to Life™
Booth N5011

See all the yellobriks at
www.yellobrik.com
infousa@lynx-technik.com

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SOLID-STATE UHF TRANSMITTERS
Larcan MXi series

Low-power transmitters; range from 10W to 500W digital and beyond; a solution for broadcast applications and mobile video; capable of all standards in analog and digital; state-of-the-art digital modulator for optimum performance; is frequency agile; offers a high-performance LDMOS technology amplifier design and fully regulated power supplies; features built-in diagnostics with remote control; an Internet interface is also available.

905-564-9222; www.larcan.com
Booth: SU3317

BROADCAST TESTER
Rohde & Schwarz R&S SFE

Combines an RF modulator, a universal real-time coder and baseband signal sources; generates broadcast signals in the 100kHz-2.5GHz frequency range; generates all signals for analog or digital terrestrial TV, cable, satellite, mobile TV and digital sound broadcasting; offers an additional A/V test signal generator for analog TV; accepts transport streams or analog A/V signals from external baseband generators; includes an ARB waveform generator.

410-910-7800
www.rsa.rohde-schwarz.com
Booth: SU3717

TRANSMITTER
Axcera 6X series

The high-powered, liquid-cooled TV transmitter offers high power density in a small footprint, with N+1 power supplies for reliability, hot-swappable amplifiers for simple maintenance, and a broadband combiner for future upgradeability; available in power levels up to 7kW DVB, and 17kW analog in a single cabinet, with multicabinet configurations available for higher power levels.

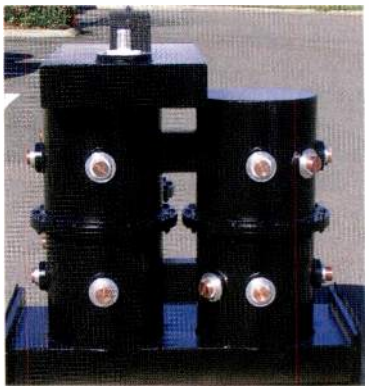
800-215-2614; www.axcera.com
Booth: SU2908

COFDM MICROWAVE TRANSMITTER
Nucomm CamPac2 Plus

Intended for wireless camera applications, such as sports coverage and electronic news gathering; offers MPEG-4 encoding/decoding, HD, low power consumption and is available in licensed bands and others upon request; rugged machined housing provides durability and thermal characteristics for operation in the harshest of conditions.

800-968-2666; www.nucomm.com
Booth: C6419

TV MASK/FILTER COMBINER
Jampro UHF RWED-516-U



Features four-port directionality that can be used as either a mask filter or constant impedance-combining module for high-power UHF TV broadcasts; the combiner has a cross-coupled design to accommodate adjacent channels, meets stringent filtering standards, and provides constant impedance performance for adjacent and channel separations greater than 15; provides the high isolation of traditional constant impedance technology and achieves elliptical response without external coupling mechanisms; large cavities handle high power with low insertion loss; its filters are temperature compensated for closely spaced applications.

916-383-1177; www.jampro.com
Booth: C2607

A/V PROCESSOR
TV One C2-7310

Has three DVI, three composite video, three YC and two SD/HD-SDI with two independent output channels, each with DVI-I, composite, YC and SD/HD-SDI; features include up/down/crossconversion, key, PIP, mix, preview, edge blending and 48-channel stereo processing and I/O; supports 32 AES-3id digital audio in and 16 AES-3id digital audio out.

800-721-4044; www.tvone.com
Booth: C3943

MULTIPATTERN CONDENSER MICROPHONE
Audio-Technica U.S. AT4047MP

Delivers vintage sound in a multipattern design with selectable omnidirectional, cardioids and figure-of-eight polar patterns; transformer-coupled output and specially tuned element provide sonic characteristics reminiscent of early F.E.T. studio microphone designs; features a wide dynamic range, low self-noise and high SPL capability.

330-686-2600; www.audio-technica.com
Booth: C1632

EDITING SYSTEM
Grass Valley EDIUS 5.5

PC-based nonlinear editing software; now includes real-time, full-resolution AVCHD editing already released for the EDIUS Neo 2 Booster package; ideal for professional and prosumer videographers who shoot and edit AVCHD video and need native real-time performance when editing material compressed with the AVCHD format; is now Windows 7 compatible.

503-526-8100; www.grassvalley.com
Booth: SL106

SWITCHER/MIXER
Panasonic AG-HMX100

A low-cost HD/SD digital A/V mixer that incorporates a built-in multiviewer display output and combines high-quality video switching and audio mixing features; offers a flexible use interface and supports SD, HD, and 3-D HD formats; supports multiple camera workflows, from production, to corporate A/V projects, to wedding and live events; can switch 3-D HD video.

201-392-6141
www.panasonic.com/broadcast
Booth: C3712

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You Can Count on CEI For Award-Winning Systems Integration — Plus Sales and Service For the Industry's Best Products!

You've relied on CEI for 24 years to deliver world-class systems design, integration and service. Now, we're also applying that award-winning dedication to excellence and reliability to providing superior broadcast and multimedia solutions, such as the Grass Valley™ K2 Dyno™ replay controller.

This compact, cost-effective controller is designed to help sports producers and other professionals capture live events in SD and HD resolutions and instantly play them out at variable speeds for critical analysis during fast-paced events.

In addition to offering complete turnkey systems and solutions, CEI also has a comprehensive **maintenance and repair center**, with full-time professional broadcast and IT engineers offering on-site and in-house repair, support and training. CEI also offers training and customized maintenance contracts to fit your specific needs. We can even help with your legacy systems.

For more information, visit our Web site at www.commeng.com, email sales@commeng.com or call 703-550-5800.

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SALES@COMMENG.COM

grass valley

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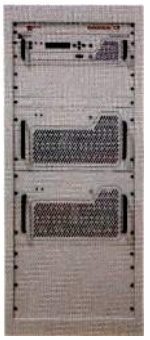
TRANSMITTER
Axcera Innovator CX



Low-to-medium power UHF transmitter/translator/gap filler/repeater that offers a high level of performance and reliability; fully contained in a single 3RU chassis for power levels up to 125W, and can achieve up to 1800W ATSC, 1600W DVB and 3900W analog with additional compact, higher-power amplifiers; available for most any current digital standard, including ATSC, DVB-T/H/SH, ISDB-T/Tb, CMMB (STiMi), MediaFLO and more.

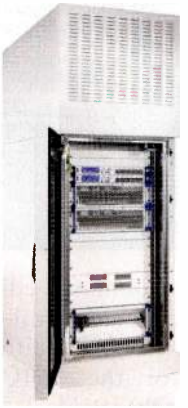
800-215-2614; www.axcera.com
Booth: SU2908

VHF TRANSMITTER
Larcan M series — Revolve

Digital/analog solid-state VHF transmitter; features worldwide standards, full power range in analog or digital and state-of-the-art broadband design; offers a fault-tolerant stripline PA architecture; includes integrated system diagnostics; extensive remote control and monitoring capabilities are available with new In-SiNC software.

905-564-9222; www.larcan.com
Booth: SU3317

OUTDOOR HOUSING
Rohde & Schwarz
R&S KGO880



Protects transmitters against extreme climatic conditions; suitable for digital and analog broadcasting networks; available in standard and robust steel versions.

410-910-7800
www.rsa.rohde-schwarz.com
Booth: SU3717

LOW-POWER ANTENNA SERIES
Dielectric DLP Antenna

Features horizontally polarized antennas in a number of SD azimuth patterns, with an average power rating of 1.6kW; designed to provide a low weight and windload system for mobile media transmissions, distributed transmission systems and translators; features an eight-bay single module design; provides a single 7/8in input, a 1.5-degree beam tilt and a low-profile slot cover for protection from environment wear and tear.

207-655-8100; www.dielectric.com
Booth: C2222

ROUTERS
Blackmagic Design Videohub

Routing switcher that features up to 144 inputs, 288 outputs, 144 deck control ports, and auto switching SD, HD, and 3Gb/s SDI, all in a compact rack mount chassis only a few inches thick; reclocks the SDI video signal for long cable lengths; enables users to send one SDI video connection to as many outputs as wanted, so multiple people can access any SDI video source, all at the same time.

630-307-2400
www.blackmagic-design.com
Booth: SL6020

IFB RECEIVER
Nucomm ProQ
Digital IFB System

DTV IFB receiver is ideal as an IFB solution for ENG users during DTV transmission, monitoring of DTV signals through a DVB-ASI output and streaming video over an IP connection to a laptop or other IP-enabled device; measures 5in x 1.75in x 8.5in and features dual UHF/VHF antennas, two advanced silicon tuners and sixth generation VSB demodulators; contains an MPEG Layer 1/Layer 2 audio decoder that is capable of decoding two independent sound programs, providing up to eight audio channels and using bit rates as low as 32kb/s for each.

800-968-2666; www.nucomm.com
Booth: C6419

WEATHER GRAPHICS
Weather Central ESP:LIVE

Provides high-resolution visibility of storm tracks and threats, enabling broadcasters to take their audience from a macro view right down to street level where it impacts them most directly.

608-274-5789; www.weathercentral.tv
Booth: SU912

PORTABLE DIGITAL MICROWAVE LINK
RF Central Pro-Link HD

Offers MPEG-4 encoding/decoding in a bidirectional complete transmit and receive system as well as balanced microphone and line-level inputs via switch-selectable XLR connectors on both transmitter and receiver; equipped with phantom power for microphones; operates in 5.8GHz band; delivers at up to 2000ft range in HD and SD.

980-852-3700; www.rfcentral.com
Booth: C6419

ROUTERS
PESA Ocelot-3

For small-scale routing of 3G-SDI and support up to 1080p/60; capable of routing all SMPTE and ITU standards for serial digital video, including support for embedded audio and other ancillary data for broadcast and digital cinema requirements; can be configured as a 16 x 8 or 16 x 16.

800-323-7372; www.pesa.com
Booth: N4123

BROADBAND UHF SLOT ANTENNA
Jampro Prostar JA/MS-BB

Part of the Prostar line; provides a single, compact solution that conserves tower space and minimizes wind loading; designed for multichannel/combined channel operations in analog-analog, analog-digital or digital-digital TV applications; comes in a wide selection of standard and custom transmission patterns; can be configured for horizontal, circular or elliptical polarization, beam tilt and null fill are available; handles power ranging from 2kW to 10kW; input impedance is 50Ω and VSWR of 1.1:1 or better can be achieved over sub-bands ranging from 470MHz-530MHz to 835MHz-890MHz.

916-383-1177; www.jampro.com
Booth: C2607

MULTIPLEXER
Nevion VS908-Ax-GE

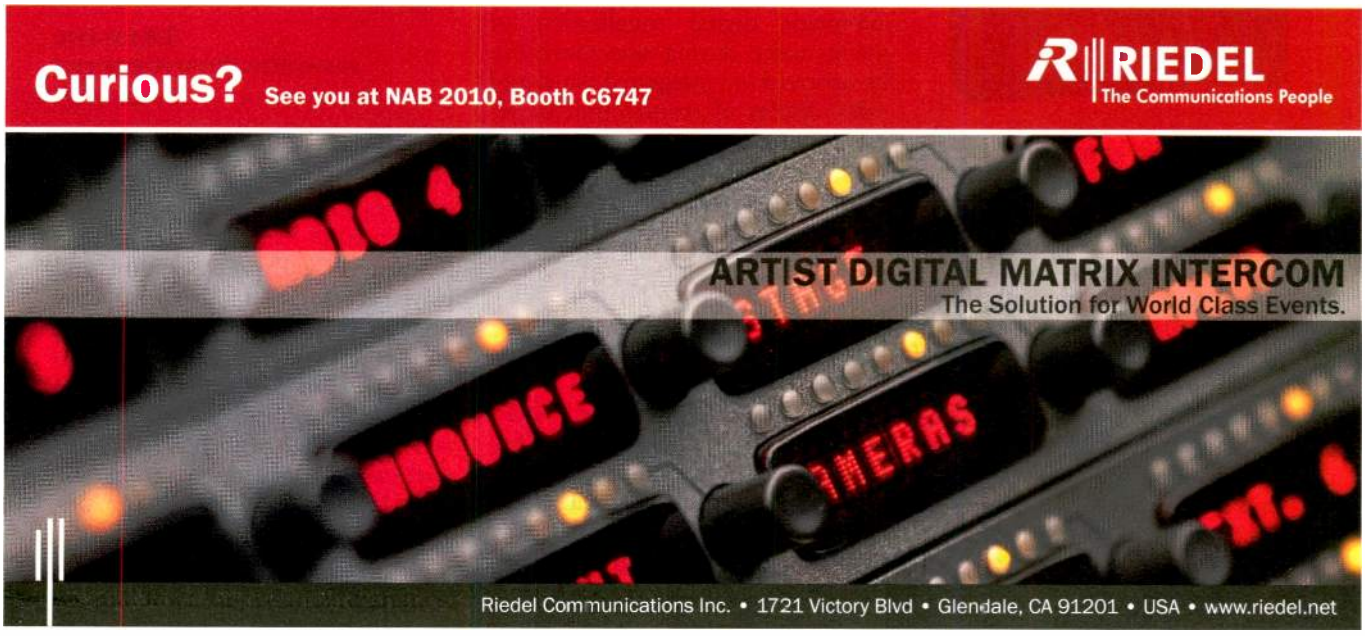
The single-slot Ventura card aggregates eight ASI (EN50083-9) video streams onto a single Gigabit Ethernet link; complies with Professional MPEG Forum CoP-3 (SMPTE-2022-2/SMPTE-2022-1) specifications for IP encapsulation and FEC, thus protecting against network congestion and ensuring packet transmission; transports single or multiprogram transport stream (TS) and assigns port bandwidth through configurable channel bit rates with 1kb/s resolution.

805-247-8560; www.nevion.com
Booth: N4624

MOTORIZED COAXIAL SWITCH
ERI Motorized Coaxial Switch

Broadband (54 MHz to 862MHz) motorized coaxial switch; the four-port motorized switch features a Geneva drive and operates on any VHF or UHF channel without tuning or modification; suitable for switching multichannel television systems and for use in N+1 transmitter systems.

877-374-5463; www.eriinc.com
Booth: C2032



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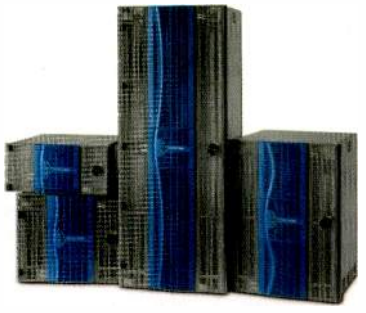
CIRCULARLY POLARIZED ANTENNA
Dielectric TUL UHF CP Antenna

Engineered to fill coverage gaps in broadcasting networks with a 500W power rating per panel; circularly polarized system provides reliable signal performance for mobile media broadcasting; features a lightweight aluminum construction with an ABS radome, a 65-degree beam width, and broadband 10-channel bandwidth; can be configured in standard narrow and wide cardioids, peanut and omni-azimuthal patterns, and with various elevation gains; operates with a single Type N or 7/16 DIN input and provides a low VSWR.

207-655-8100; www.dielectric.com
Booth: C2222

ROUTER
Harris Platinum router



Embedded audio processing router; offers savings in terms of cost, space, power and complexity; internal TDM audio routing means no external audio frames are required; standard I/O modules are retrofittable with internal mux/demux modules for up to 16 channels of audio per video I/O; features new "green" coax and fiber modules, enabling savings of up to 3W per module and up to 128 modules per frame; new powerful database editor features fast "Excel-like" functions to speed configuration and editing.

800-231-9673
www.broadcast.harris.com
Booth: N2502

CONTRIBUTION ENCODER
Ericsson CE-xH42

Features include future-proof 3Gb/s hardware with a software upgrade path to enhanced features, encoding efficiency that allows for migration of the highest-end MPEG-2 HD 4:2:2 links to MPEG-4 AVC, stand-alone box operations for point-to-point links and plug-and-play expansion slots for a fully integrated, upgradeable solution.

678-812-6300; www.ericsson.com
Booth: SU3308

HIGH-POWER TRANSMITTER FAMILY
Rohde & Schwarz R&S Nx8600

Features liquid cooling system; supports analog and DTV standards; accommodates a transmitter system with an output power of up to 6kW, 9kW or 16kW in a 2m-high rack; supporters typical R&S standby configurations, remote maintenance and diagnostics via different locations, automatic digital equalization or maintenance during operation; can be operated via integrated panel and color display of control unit or remote controlled via the Internet.

410-910-7800
www.rsa.rohde-schwarz.com
Booth: SU371

TRANSMITTERS
Linear ADVANCED•TV Digital series

Specifically built to a user's exact broadcast requirements; comes fully assembled and optimized by the company's engineers in its Elgin, Ill., facility; designed with scalable power drawers and varying cabinet heights.

847-809-5885; www.linear-tv.com
Booth: SU8512

WEATHER GRAPHICS
Weather Central 3D:LIVE

A real-time broadcast weather platform for HD and SD; integrates up-to-the-second data, 3D effects, animations, high-resolution maps, and comprehensive storytelling tools that ensure a continuous supply of fresh content; new tools enable meteorologists to quickly and easily personalize forecasts, graphics and alerts for distribution to their audiences across the complete spectrum of broadcast, online and mobile communications mediums, including social media platforms such as Twitter and Facebook.

608-274-5789; www.weathercentral.tv
Booth: SU912

PORTABLE TRANSCODING SYSTEM
Alteran Technologies
ViTaDi-ExPack

Designed to work in conjunction with ViTaDi-AutoPack to deliver a portable end-to-end digitization and transcoding video capture solution; comes with the Telestream Episode Engine transcoding software and Apple Xserve computers that can take four streams of encoded material and transcode up to 16 streams in real time; included as standard is management software designed to interface with ViTaDi Control Software to generate reports on the status of encoded material.

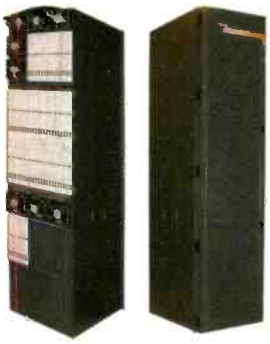
818-998-9100
www.alterantechnologies.com
Booth: C9733

PCI EXPRESS EDITING SOLUTION
Blackmagic Design
Multibridge Eclipse

External PCI Express capture and playback solution that instantly switches between SD, HD and 2K, in 4:2:2 or 4:4:4 video quality; connects to your PC or Mac with high-speed 10Gb/s PCI Express for editing system, or use independently as a bidirectional SDI video converter; features 3Gb/s SDI, HDMI and analog editing with 16 channels of audio.

630-307-2400
www.blackmagic-design.com
Booth: SL6020

FIBER AND COAX SWITCHERS
PESA 384X720



Cheetah line of fiber-optic and coax-based matrix switchers for end-to-end digital transmission of computer video and 3G-SDI / HD-SDI digital video; the Cheetah 384XR can expand from 16 x 16 up to 384 x 720 and supports switching transports for 3G-SDI, dual-link HD-SDI and the latest 3-D stereoscopic requirements; features front-loaded and accessible matrix cards, power supplies and control cards.

800-323-7372; www.pesa.com
Booth: N4123

LPTV TRANSMISSION SYSTEM
Larcan PLUS series

A fully integrated multichannel digital LPTV transmission system integrates the new OCTANE encoder/multiplexer; features multiple baseband inputs, up to four multiplexed SD channels and an integrated dynamic PSIP; is ATSC closed-captioning compliant; a Pathwaves digital microwave STL system is optional.

905-564-9222; www.larcan.com
Booth: SU3317

PORTABLE PROMPTING SYSTEM
Autoscript Xbox Ultra

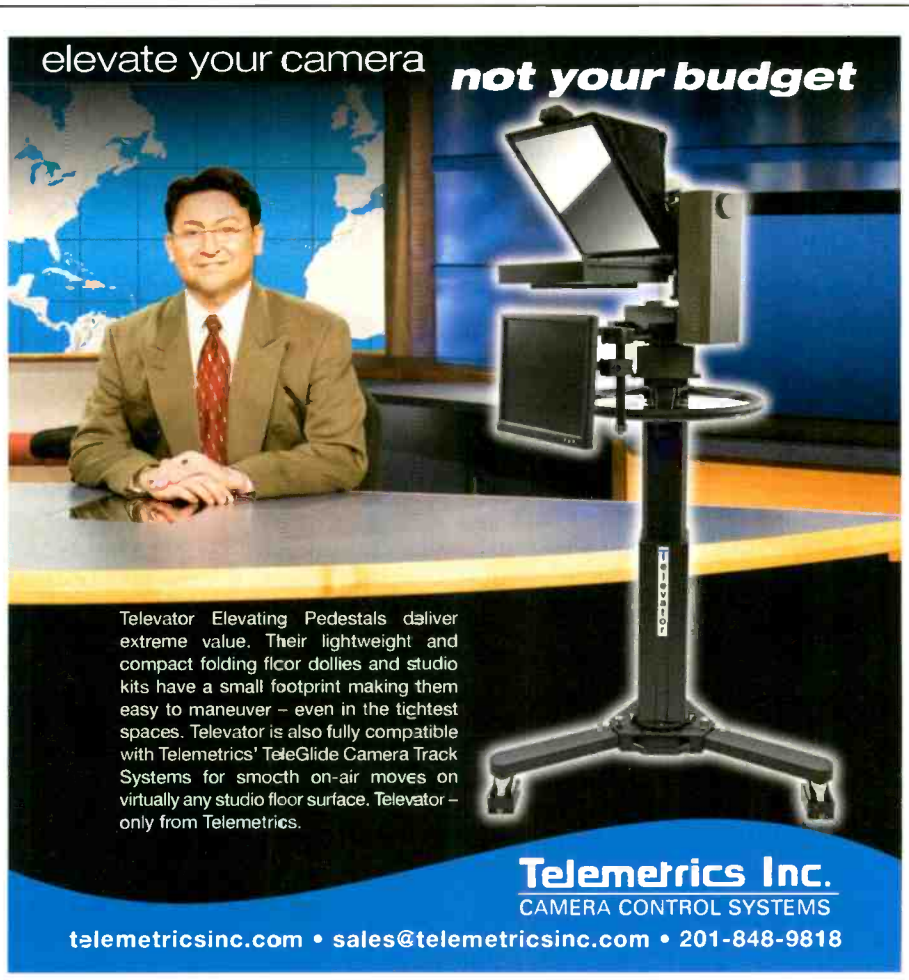
Connects via USB port to a laptop or PC and provides enhanced features and capabilities, which make it useful for portable prompting; now features four outputs; can power twice as many on-camera units; also features a smooth on-screen scroll on the computer screen, eliminating the need for an external preview monitor; the video output is standard composite PAL or NTSC and is compatible with all Autoscript on-camera units.

203-926-2400; www.autoscript.tv
Booth: C6025

I/O VIDEO SWITCHER/SCALER
TV One C2-2355A

Provides high-quality, bidirectional conversion between a variety of video formats; features include DVI/RGB/YPbPr, up/down/crossconverter, PIP, key, mix, stereo switch and edge blending; I/O can be SD/HD-SDI, DVI, RGB, YUV, YPbPr, composite or S-video; incoming video parameters may be adjusted; stores settings in nonvolatile memory; 10 user-defined presets are available to customize settings.

800-721-4044; www.tvone.com
Booth: C3943



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EMERGENCY ALERT MANAGEMENT SYSTEM
Digital Alert Systems DASDEC-II

Includes integrated support for MPEG-2 or MPEG-4 outputs, a browser-based interface for remote monitoring, up to four Ethernet ports for multiple access points within a station and automatic FCC-compliance logging within the system's nonvolatile memory bank; can be used as a drop-in replacement for any existing EAS encoder/decoder set; supports a broad range of physical connection and interface protocols; engineered to handle future emergency alert requirements with software; flexible packaging allows for various model configurations.

585-765-2254
www.digitalalertsystems.com
Booth: C3651

ENCODER
DVEO HCoder ASI/IP

Supports both H.264 HD and SD encoding, with automatic standards detection and simultaneous dual ASI outputs and GigE IP output; the input can be HDMI, SDI, HD-SDI, component analog (YPbPr), or CVBS; based on advanced Fujitsu encoding chipsets; features SD to HDTV resolution up to 1920 x 1080 x 60i/50i; includes LCD front panel controls and head-end management software; audio encoding is MPEG-1 Layer-II with optional Dolby Digital AC-3 passthrough or optional AAC.

858-613-1818; www.dveo.com
Booth: SU2709

FINAL CUT PRO PLUG-IN
Grass Valley Connect

Plug-in for Final Cut Pro users; increases productivity and provides new performance benefits when working with Grass Valley K2 media servers and storage area networks; the latest version 2.0 adds tighter newsroom computer integration with K2/Aurora news systems, via the MOS protocol, to tightly link scripts with audio and video clips making digital news production easy and getting news content to air much faster and more efficiently.

503-526-8100; www.grassvalley.com
Booth: SL106

4K PROJECTOR
JVC DLA-SH7NLG

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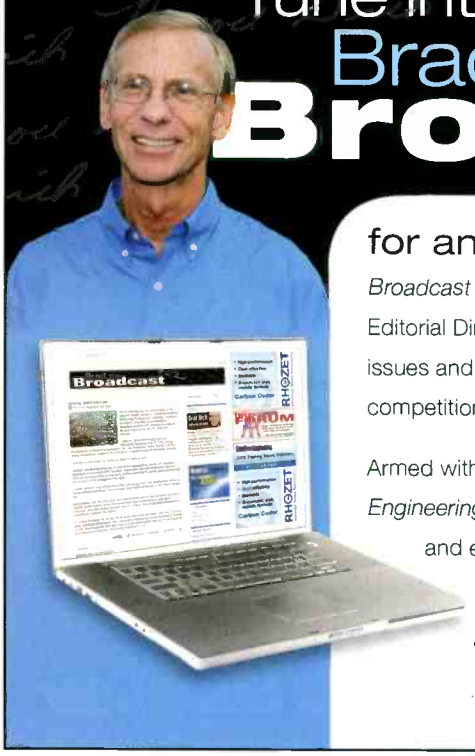

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Broadcast Engineering has launched an exciting new weekly dialog called *Brad on Broadcast*. Editorial Director, Brad Dick, hosts the blog and offers his viewpoints on key industry issues and those most affecting the magazine's readers. From technology to budgets, from competition to industry cutbacks, Brad tackles them all—and invites your feedback.

Armed with 18 years as a broadcast engineer and more than 20 years as a *Broadcast Engineering* editor, Brad Dick understands the challenges and needs that technical managers and engineers face. He's been on the front line solved problems and learned from the experiences. Now he's sharing those thoughts in a weekly blog.

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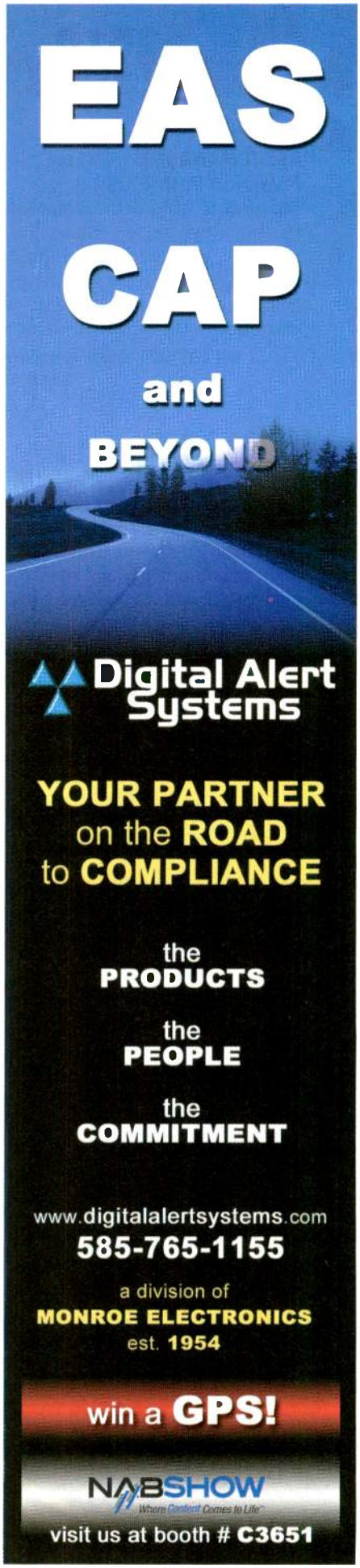

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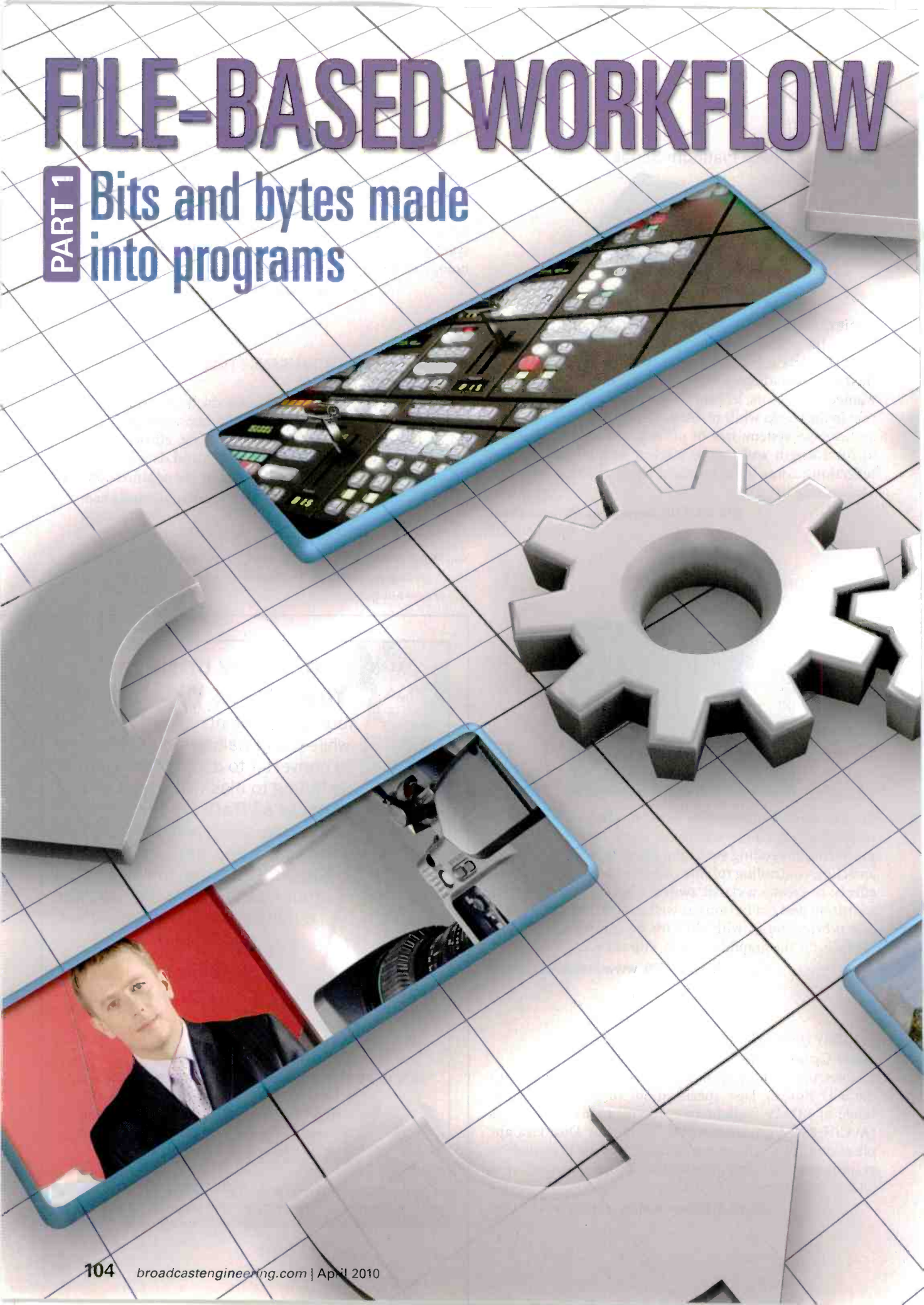
FILE-BASED WORKFLOW

PART 1 Bits and bytes made into programs



BY JOHN LUFF

We are officially in a file-based world. That is not a shock; we have been moving that way for years. Now even cameras are spoken of as recording files, so I guess we have crossed the equivalent of the Rubicon. When Caesar crossed that celebrated river, he broke a Roman law. Progress in several technologies helped our industry to make this transition more than 20 years after nonlinear editors began working with files in earnest.

This first installment of a two-part series will look at the underpinnings of what is generally called file-based workflow, defining terms and setting the reference points in the discussion. Make no mistake: Using files instead of physical media is a radical change in how we work. British writer Sidney Smith said, "To do anything in this world worth doing, we must not stand back shivering and thinking of the cold and danger, but jump in, and scramble through as well as we can."

Key concepts of digital content

The change mentioned above is brought on by embracing the digital nature of content, which is well described in the book "Being Digital" by Nickolas Negroponte.

There are three overarching concepts, spelled out more than a decade ago by the EBU/SMPTE Task Force on Harmonized Standards for the Exchange of Television Program Material as Bit Streams over a decade ago. First is essence. Essence is the content of a program, video and audio, and perhaps data for interactivity or other applications. Second is metadata, which most simply put is bits about the essence. It describes the content in ways that will allow a user to decode and use the essence. It might, for instance, describe the encoding used (MPEG-2, H.264, JPEG2000), the number of audio tracks, program rights information and even GPS coordinates where it was shot. Third is the idea of a wrapper. The wrapper surrounds the essence and metadata. It allows for parsing of the content and metadata to decoders in an efficient manner without requiring a multiplicity of files loosely coupled and difficult to manage. Wrappers are familiar to us, including MXF (Material Exchange Format, standardized by SMPTE), AVI and QuickTime.

It might be useful to look at another analogy. SDI and HD-SDI are similar to baseband wrappers. They carry video and audio, as well as metadata. There are important differences, however. SDI (and HD-SDI) does not announce the presence of services. Audio is always in the same place in the signal, so if a decoder is looking for audio, it

knows where to look. Metadata is a bit less obvious, but as with audio, it does not announce its presence. One must know what to look for and where. With wrappers in file-based operations, the wrapper announces what is being carried and points to where it is. Thus, each file is self-referencing. As soon as it is received, an application can inventory the contents of the wrapper and disburse information to other applications as needed. (See Figure 1.)

Another key concept is that dubbing content to make copies is no longer appropriate. When you copy a file, you create another instance that's totally indistinguishable from the original. If a file is altered, perhaps with closed captions, or maybe the content is edited, you create a new version. Managing the multiplicity of instances and versions can be one of the more difficult aspects of a file-based facility. It requires a good asset management system to fully track versions and instances (and instances of versions). Later, I'll discuss some tools that allow complex descriptions of content to be part of the wrapper in ways that facilitate standardized program interchange and flexible creation of versions from a set of related essence elements.

Another important, though obvious, point is that all file-based facilities are network-based, IT-centric installations. That is not to miss the point that some aspects of a file-based world need to bridge to the linear analog world. Ingest in news is an obvious example of a hybrid workflow where file-based and linear worlds must merge seamlessly into a whole. Most release-to-air facilities similarly are in the hybrid camp. It is critical to understand that a file-based workflow is inherently not synchronous and time-dependent; it is asynchronous and loosely, if at all, coupled to time. There are methods of treating files as time-dependent entities, most clearly thought of as streaming.

Generally, networks deliver best effort movement of content, which is not a great way to run master control. To get beyond that, one really needs to do a good job of designing applications and controlling the architecture of the network on which the system lives. When this is done well, it works transparently.

The issue of synchronicity is central to many discussions about file-based workflow. Master control must deliver content reliably concatenated and locked to a delivery time. The goal of file-based master control is to provide the illusion that the content is seamless and continuous. To do that in the DTV world means that metadata must be delivered with essence. Even embedded metadata, such as dialnorm and DynRng, are tricky to deliver in a complete system. Consider the case of a fade between two sources. Picture and sound are easily handled, but how does one transition metadata? Most implementations today pick a point in the essence transition and simply chop to the new source of metadata, a decidedly inelegant answer to a growing problem. The same problem exists in AFD and other classes of metadata.

There is a second problem with metadata management that is not immediately obvious. There are times when metadata needs to be separately processed, such as when rights information is updated. That means bytes need to be copied out of a container, transmitted to a program where they are modified, and later replaced in the original file, or perhaps a new version. It is possible that two operations are happening at the same time, leaving a complicated resyncing of metadata to be done. In the last few months, work has begun on a standard way to communicate that metadata, likely based on the SMPTE BXF standard. The data is XML code, which is what BXF is built on, so this appears to be a logical approach.

Structures for managing digital content

Earlier I mentioned structures for managing files and metadata. The good news is that MXF provides the framework for carrying a multitude of content types. The bad news is that there are a ton of options, including 10 different operational patterns. The standard encompasses hundreds of pages.

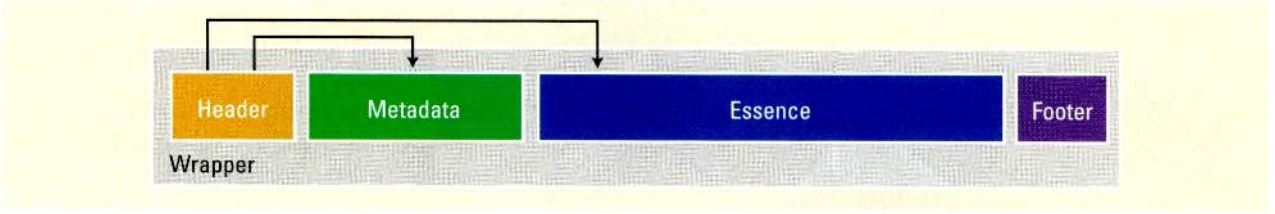


Figure 1. The MXF wrapper structure

Some have claimed that MXF compliance is a recipe for client confusion and lack of interchange. While overstated, it is true that narrower standards force more controllable interchange. The Advanced Media Workflow Association (AMWA), whose predecessor was AAF, is an industry interest group made up of users and manufacturers that work out application specifications and related "shims," which describe the constraints on content and the MXF implementation to be used. This allows a narrowly defined implementation of MXF to accommodate a specific application. Two worth mentioning are AS-02 Versioning (sometimes called

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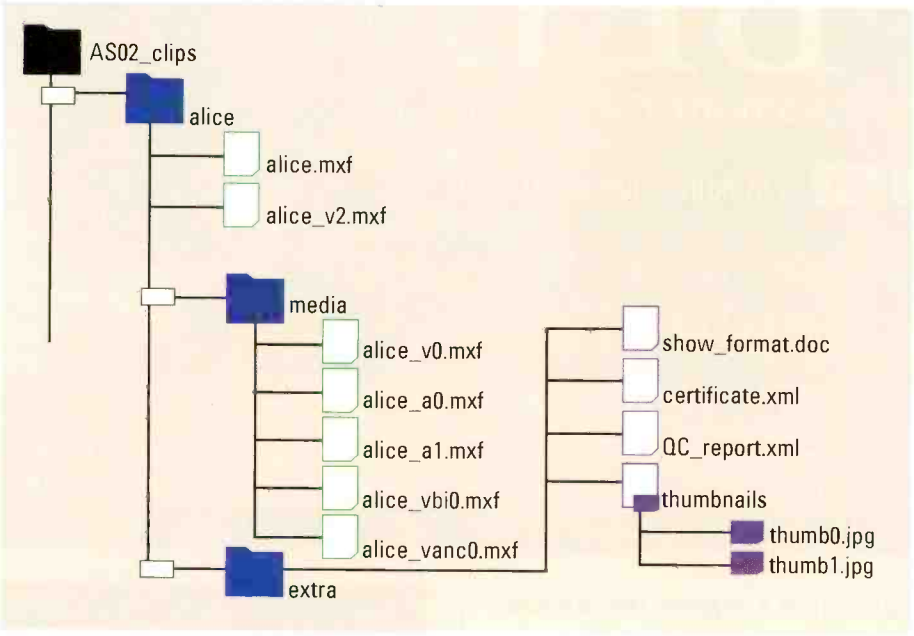

Figure 2. Example of AS-02 structure

the MXF Mastering Format) and AS-03 MXF Program Delivery, which targets file delivery of programming to stations. The first user of AS-03 is PBS, who will be using it (with its specific shim) to deliver programs to edge servers ready for use at PBS stations. Testing is in progress now.

By specifying AS-03, the content and container are tightly defined, including video and audio encoding choices like bit rate and coding structure, number of tracks and the metadata structure, which carries the details about the content. A server manufacturer that can play an AS-03/PBS file must be capable of dealing with the details of the essence. Simply saying a server is MXF-compliant leaves the question of bit rate, coding standard and structure, number of audio tracks, etc., undefined. AMWA has carried it to the next level, making applications for the real world work.

AS-02 solves a different problem. In linear workflow, a version is a generation down from the master, and if many versions are necessary, many copies must be created and kept in an inventory. Using AS-02, a new version with German translation and subtitles, for example, could be created by adding tracks to a master, which can then be played out with only the new tracks varying between different air versions.

In 2007, at the NAB Show, a nascent AMWA led by Turner Entertainment demonstrated the concept at work, with multiple manufacturers showing interchange of essence and metadata seamlessly. At last fall's SMPTE Annual Technical Conference, AMWA put on another demonstration even more impressive. Figure 2 shows two .mxf files in the "alice" directory, each of which would specify a construction with various tracks needed to fulfill program requirements. To add another language to the library, a new track is recorded and dropped into the folder — for example, alice_a2.mxf. To play it, you might create alice_v3.mxf, specifying alice_v0.mxf and alice_a2.mxf.

Storage choice

File-based workflow depends on access to content, but it does not necessarily require instant access to *any* content. Hierarchical storage is almost always part of a complete file-based workflow. John Watkinson, author of "The MPEG Handbook," once told a SMPTE conference that it was time the industry realized that we don't care where the content is stored; we only care that when we ask to see it, it shows up. So it is less important to know what directory an item is stored in than to be able to use a software system to gain access under reasonable requirements. If a file is needed for air in a week, it does not need to be in online storage, but perhaps it is time to make a request to the queue for the archive to retrieve it within a day of air.

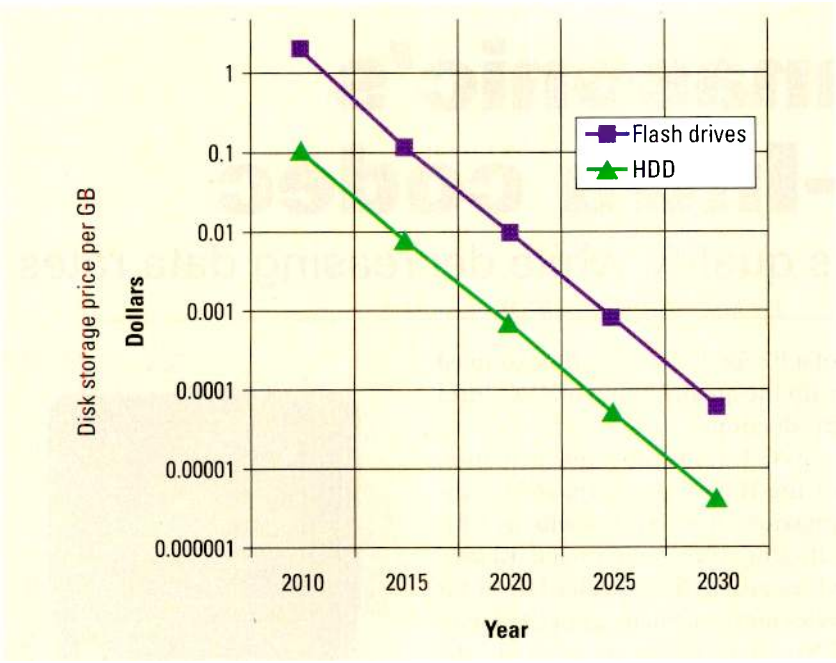

Figure 3. Cost of disk storage

By structuring storage in ways that support the intended system utilization, significant expansion in capacity and simultaneous reduction in cost is often achieved. Video servers require high-speed, high-availability storage to keep the decoder queue filled at all times. That requirement for high performance creates the most expensive storage. A compromise would be to have nearline spinning disk available with lower performance, but much more capacity at a lower cost. Behind that often resides a robotic library of tape or DVD storage, which provides long-term backup and the lowest cost, but slow access for both read and write. Systems like this are not possible without good management of the assets with MAM or archive management software.

There are interesting dynamics at play in the choice of storage of media. Disk prices continue to fall, and even solid-state disks have reached practical economics. One video server manufacturer offers a green solution with entirely solid-state storage. The argument for using tape instead of huge farms of spinning disk is based on several factors, including cost per gigabyte, power consumption and cooling, MTBF, and the need to have backup copies stored off-site. All of these factors except for power consumption decline in impact over time. By the end of this decade, HDD storage should cost less than 1 percent of current costs, or a capacity 100-fold larger will cost the same as today. Tape storage costs will also decline and access speed will increase, but likely not in direct sync with disk space costs. (See Figure 3.)

Choosing storage options is also affected by the type of workflow planned. If post-production processes will need rapid access to several different layers during rendering, solid-state storage may improve throughput and performance. These are not video issues, but rather relate to good design practices for IT systems supporting video processes. The next article will discuss the skills needed in our industry in this new age.

Conclusion

Implementing an archive system requires attention to the rules engine that defines how content is handled. Some critical content might be recorded to nearline and archive at the time of ingest. Other short-lived content might have only a copy on spinning disk. Promos that play only once might live only in the high-performance online storage.

In July, the next article in this two-part series will cover managing metadata and implementing file-based systems. BE

John Luff is a broadcast technology consultant.

Panasonic's AVC-Intra codec

The codec preserves quality while decreasing data rates.

BY MICHAEL BERGERON

Since Panasonic Broadcast began incorporating the AVC-Intra codec in select P2 HD equipment three years ago, the codec itself has not undergone any essential changes. The compression technology features bit rates of 50Mb/s and 100Mb/s, using the High 10 Intra and High 422 Intra profiles of H.264, respectively.

Developments, however, have been dramatic on the product side. Panasonic now offers the codec as a standard feature in a growing number of camcorders, field recorders and workflow tools. As significantly, virtually all our partners — companies such as Adobe, Apple, Avid, Grass Valley, Harris and Omneon — now offer native support of the codec. Broadcasters can now realize, end-to-end, the speed and ease of a P2 file-based workflow coupled with the quality bump of AVC-Intra production.

AVC-Intra is the implementation of the H.264/AVC-Intra-only compression in P2 HD products. This efficient video coding standard provides production-quality HD at bit rates more normally associated with ENG applications by enabling the full-resolution, 10-bit field capture of high-quality HD imagery in one-piece camcorders.

Designed for broadcast

The codec provides 10-bit intraframe encoding in two modes: AVC-Intra 100 for mastering video quality and AVC-Intra 50 for very high image quality at a significantly lower data rate.

As an intraframe approach, it captures and preserves the greatest amount of information while offering the greatest flexibility. Unlike long-GOP approaches, it was explicitly designed and optimized for broadcast and production use rather than low-bandwidth distribution.

The Panasonic AJ-HPM200 recorder/player can record in AVC-Intra 100 and 50.

AVC/H.264 is a codec family with both intraframe and interframe compression implementation profiles. Interframe compression (long GOP) is typically used for content delivery and packaged media; in this mode, its efficiency is unequaled. However, any image manipulation or processing will severely degrade the image quality in long-GOP compression schemes. By contrast, intraframe compression processes the entire image within the boundaries of each video field or frame. There is zero interaction between adjacent frames, so its image quality stands up well to motion and editing. Intraframe compression is used most often for broadcast and production applications where

This efficient video coding standard provides production-quality HD at bit rates more normally associated with ENG applications.

Format	AVC-Intra 100	AVC-Intra 50
1080p23.98	80 minutes	160 minutes
1080p29.97, 1080p25	64 minutes	128 minutes
1080i50, 1080i59.94	64 minutes	128 minutes
720p23.98	160 minutes	320 minutes
720p29.97, 720p25	128 minutes	256 minutes
720p59.94, 720p50	64 minutes	128 minutes

Table 1. Approximate record times for various formats and AVC-Intra codecs.

such image manipulation is normal. AVC-Intra takes this process to new levels when it combines the advantages of H.264/AVC software encoding tools to increase the coding efficiency, doing so without the editing/generational quality limitations associated with long-GOP coding schemes.

VSLI available today can handle added computational complexity as is applied in AVC-Intra. The same can be said for the latest multicore CPUs. This processing power can be applied to more sophisticated compression tools such as intraframe prediction or entropy coding customized to image content.

AVC-Intra recording is a standard feature in the Panasonic AJ-HPX300 camcorder.

Technical details

Because P2 files are not bound by the format conventions of video signals or linear tape recording, 24p is recorded natively with no need for pulldown or redundant frames. This reduces the required data an simplifies the file and associated time code.

Supported formats and frame rates include 1080 progressive video (23.98p/25p/29.97p), 1080 interlaced video (50i and 59.94i) and 720 progressive (23.98p/25p/29.97p/50p/59.94p). It is recorded in MXF files when stored to P2, tape or disk, or sent over network data links, and exchanged over IP networks and storage systems in the same manner as DVCPRO P2 content. The MXF operating pattern is OP-ATOM, a simple, efficient and preparsed system, permitting easy access to audio/video data as well as XML metadata, proxy and bit maps for easy access to the content. Due to the flexible, IT nature of the file-based P2 recording system, both AVC-Intra and DVCPRO file formats of all video standards and frame rates can reside on the same P2 card.

AVC-Intra 50, targeted at broadcast applications, is an efficient compression scheme, especially when considering the high quality of the video. This compression format uses horizontal resolutions similar to that of existing compression technologies, yet provides double the recording time on P2 cards, a powerful solution that cuts media storage and distribution costs. The storage and bandwidth savings, without the compromises of long-GOP compression, allow it to provide subjectively similar video quality to DVCPRO HD at half the bit rate, a plus for news and bandwidth-efficient requirements. While the compression format uses a 4:2:0 sampling structure, careful color channel filter processing and subsequent resampling, combined with the codec's 10-bit intraframe nature, provide top-quality video.

Due to the flexible, IT nature of the file-based P2 recording system, both AVC-Intra and DVCPRO file formats of all video standards and frame rates can reside on the same P2 card.

The hardware

The codec was initially implemented in Panasonic's AJ-HPX3000 2/3in 1080p 2.2-megapixel P2 HD camcorder and as an option in the multiformat AJ-HPX2000 2/3in 1.1-megapixel P2 HD camcorder and the AJ-HPM100 P2 mobile recorder/player. As of March 2010, it is offered as a standard feature in the AJ-HPX3700 and AJ-HPX2700 P2 HD VariCam camcorders, in the AG-HPX300 P2 HD camcorder, and in several workflow tools (the AJ-HPM200 P2 Mobile, AJ-HPG20 P2 portable recorder and just-announced AG-MSU10 media storage unit, which will be available later this year).

The Panasonic AJ-HPX2700 VariCam includes master-quality 10-bit 4:2:2 AVC-Intra recording.

The 2010 NAB Show finds us in the enviable position of having an array of broadcast-oriented products that, with the implementation of AVC-Intra, deliver a fast, easy workflow at the highest production level. BE

Michael Bergeron is group manager and strategic technical liaison at Panasonic Broadcast.

Simple remote access

DK-Technologies explores the separation of client and server for all incoming signals.

BY RICHARD KELLEY

As more and more broadcast facilities look for ways to reduce cost without compromising quality, DK-Technologies has been studying its own area of the industry to see if changing the way people monitor audio and video might help them achieve these twin ambitions.

Exploring the options

Initially we thought about providing a basic remote but rejected the idea almost immediately as we felt it was not sufficient to meet users' needs. A simple remote might allow full interrogation of the host metering or monitoring device, but ultimately it reflects only the last button push. This can cause major headaches (and substantial delays) if the engineer requires the host device to check a problem but the operator needs it to carry on doing something else while the problem is fixed.

Instead, we came up with a system that allows engineers in one location to operate the host device (the server) as they wish and see all the information they require on the built-in display. (See Figure 1.)

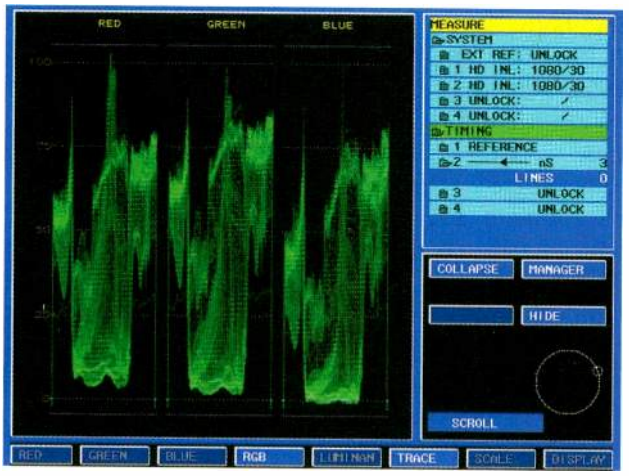

Figure 1. With the separation of client and server platforms, engineers in one location can operate the host device and see all the information they require.

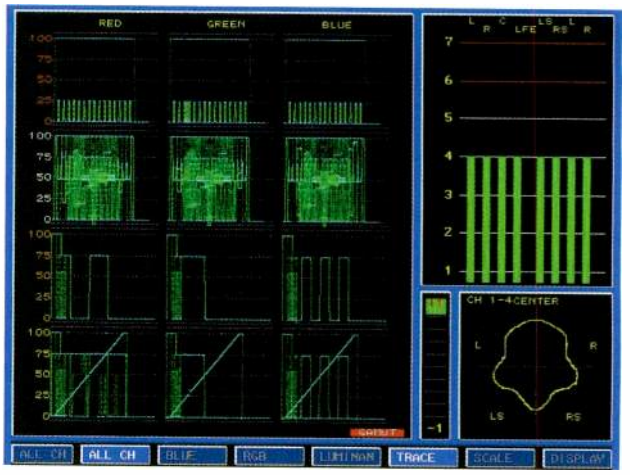

Figure 2. While an engineer in one location is viewing the display shown in Figure 1, another engineer in a separate location can use a remote client to access the same system.

Looking at the methods employed by broadcasters, we realized that although audio and video technologies are moving inexorably closer, broadcasters' working practices have not changed. They still install multiple meters, and they still use expensive router ports to achieve multichannel metering on a single meter. Seeing these complex

Broadcasters still install multiple meters, and they still use expensive router ports to achieve multichannel metering on a single meter.

At the same time, in a separate location, another engineer can use a specially designed remote client unit to access the same system but see different information on the display. (See Figure 2.) This means both ends of a link have independent control over what is shown.

To achieve this, the meters now have DVI or DVI-over-Ethernet connections so users can easily connect to external devices, local area networks or remote controls. With this new system, we have used a DVI multiplexer interface, which allows the user to install multiple HD/SD video channels and associated audio in a central technical area while also providing the ability to measure

those signals somewhere else in the facility via the DVI link. Through the use of a simple selection panel, the user can monitor and display any of the incoming signals at the remote master control room. Taken to the limits of the existing system, the maximum number of HD/SD video signals is 32 with up to 128 audio channels.

Scalable design

Due to its highly scalable design, the PT0700 series server units can service two independent control surfaces. Each control surface can operate on a shared pool of input sources and provide simultaneous analysis and control. When operating the server unit, the user can select which control surface to assign to the server front panel. Furthermore, the assignment of control surfaces can be changed dynamically, enabling the operator to toggle between the control surfaces by simply pushing a button.

Attaching a PT0700R client panel to the PT0700 series server unit introduces a whole new dimension of flexibility. The client panel is essentially a hardware unit containing the user-interface part of the PT0700 series unit; in other words, it has a similar display and front panel. The client panel must be connected to a server unit to work, since it relies on the signal sources and processing resources in the server unit. In this type of server/client system, the control surfaces can be assigned independently, which means two operators can use the server user interface and client user interface simultaneously — almost as if they had two separate units fed with the same input signals. The connection between the server unit and the remote client unit is a Digital Visual Interface (DVI-D), known from computer displays, etc. To attach a client unit to a server unit, all the engineer has to do is connect a standard DVI-D cable. By using this interface, it is also possible to separate the client and server units by several hundreds of meters using just standard DVI extension solutions that are readily available on the market.

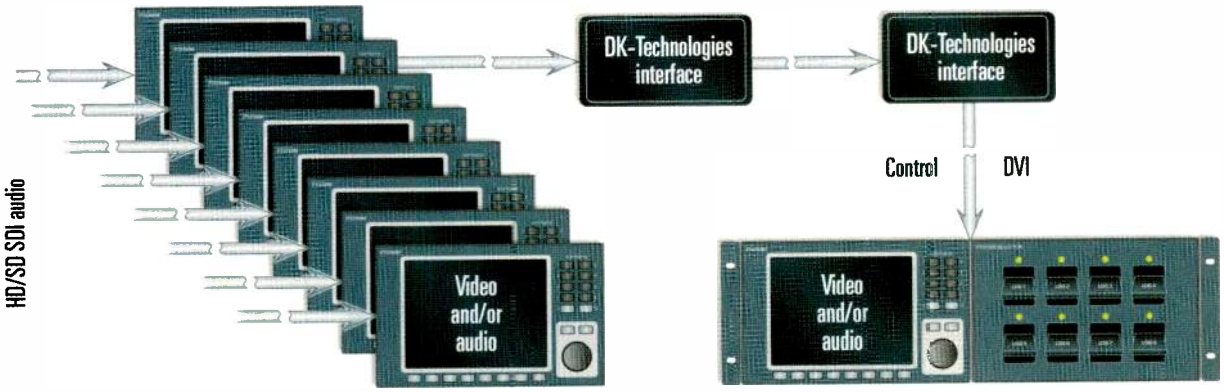

Figure 3. DK-Technologies' PT0760M system, part of the PT0700 series of waveform monitors, provides a self-contained platform for analyzing and monitoring video and audio signals.

The entire system is based around the PT0700 series waveform monitors, which provide a self-contained platform for analyzing and monitoring video and audio signals. (See Figure 3.) The signal interface is modular and provides means for accepting multiformat digital video signals (SDI), digital audio signals (AES), analog audio signals and analog timing reference signals (blackburst or tri-level). An extensive range of real-time analysis tools are provided for validating the monitored signals, ranging from multichannel video waveform displays, vectorscopes and timing measurement to audio loudness levels, surround-sound visualization, Dolby decoding and much more.

The separation of the client and the server unit makes it possible to install the server unit in an equipment room and the client unit in an operator room.

The separation of the client and the server unit makes it possible to install the server unit in an equipment room and the client unit in an operator room. This can simplify the cabling in the case of many signal sources, since the server unit can be installed in proximity of the signal sources, having only a single DVI-D cable run to the client unit at the operating position. BE

Richard Kelley is director of sales and marketing for DK-Technologies.

Orban's Optimod 8585

The unit eliminates loudness inconsistencies at VPT.

BY JOSEPH TYMECKI

Vermont Public Television (VPT) is the statewide public broadcaster and PBS outlet for Vermont. With multiple high- and low-power television transmission facilities, the broadcaster also serves bordering regions of New Hampshire, Massachusetts, New York, and Quebec.

As it completed the rebuild of its master control facility to all HD, it became apparent that an old television broadcast problem was still lurking in the plant: program loudness inconsistencies.

The broadcaster takes great care to ensure the highest quality content is presented to viewers on all of its platforms. A major part of the quality-control process occurs when content is ingested to video servers. The ingest process accounts for only a portion of what goes out over the air, however. Satellite-delivered and local live programming, plus file-based programming contributed from various sources, complicate the quality-control process of the air product. Even though great attention is paid to dialog levels throughout the content production and delivery process, programming audio levels still were occasionally inconsistent.

Seeking a solution

While the issues that cause problem programming may lie with parties outside of its organization, it is VPT's responsibility to present viewers with, among other things, programming that has consistent loudness throughout the day.

The broadcaster determined that a device was needed to be the final arbiter over audio loudness. It was not looking to crush the audio to make it sound consistently loud as in the old days of top 40 radio. Rather, the broadcaster looked for a product that "knew" when programming was overly loud and corrected the problem automatically. Moreover, this device had to be surround-sound aware so that full 5.1 programs maintained the image, or center of mix.

The features available on modern surround-sound audio processors are wonderfully numerous. Most processors have surround upmixing and downmixing and metadata compatibility with Dolby encoding systems available. Other important features for the broadcaster were having front-panel controls and the ability to handle a separate stereo program in addition to the surround-sound channels.

Vermont Public Television uses the Orban Optimod 8585 surround-sound processor to keep its viewers from having to constantly adjust the volume level.

The broadcaster considered many hardware- and software-related factors in the choice of the processor. Most importantly, though, the unit it chose had to sound natural using nonaggressive processing setups while still compensating for programming that was too loud. VPT tested several processors by placing them in the air chain and using them on-air. Ultimately, it chose the Orban Optimod 8585 surround-sound audio processor.

Processor installation

In the plant, the audio processor is installed in the air chain part of the transmission path, prior to Dolby Digital encoding equipment using discrete AES inputs and outputs. Through the use of a wizard-like setup procedure, the audio processor itself guides the installation process by asking several questions about the technical plant. The final step of the installation is supplying the unit with the dialog level of a station's transmissions. This is the level the processor uses to make the audio output compatible with the station's dialog level settings.

After placing the configured processor in its air chain, the broadcaster checked the over-the-air signal with a Dolby LM-100 loudness meter. Using the five-band TV preset with the CBS loudness controller, the broadcaster found program levels to be consistent over the entire day. The additional bonus to viewers was that this consistent loudness had a natural and open sound quality.

Consistent audio

Using the Optimod 8585 has eliminated OTA loudness inconsistencies. VPT's viewers now benefit from a consistent loudness level and quality, and its engineering and operations staff now has one less quality issue to worry about. BE

Joseph Tymecki is the chief technology officer at Vermont Public Television.

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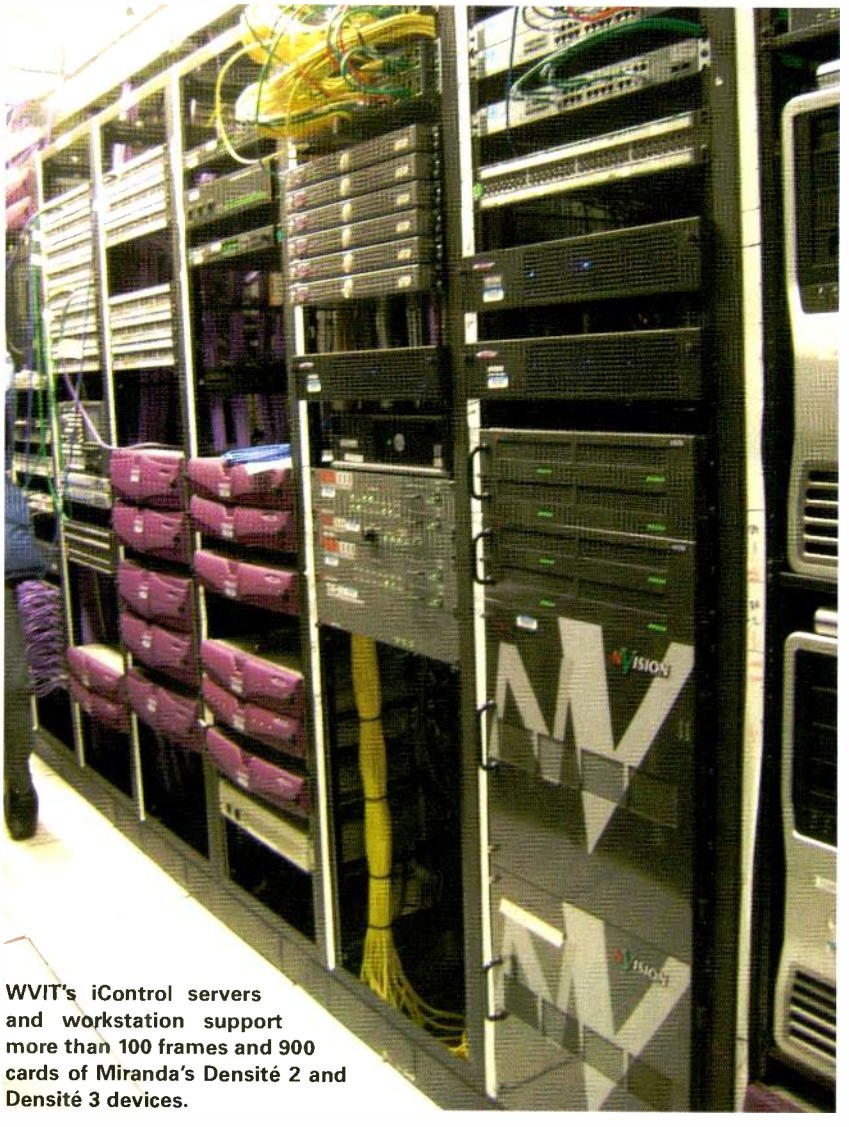
Monitoring and control

The best systems adapt to the status of the devices being controlled.

BY JOHN LUFF

Complexity is an insidious and invisible enemy in any human endeavor. What makes modern media facilities interesting is in no small measure that we have implemented complex webs of baseband and IT technology, which often exceed our ability to fully monitor and understand. It is fair to ask why we do this. The answer lies in an often poorly understood interface between software and hardware. Given that modern digital technology is often crammed into small modules in card frames, manufacturers have done a good job of providing software interfaces to control hardware processes, in no small measure because this miniaturization of components makes anything else difficult at best to build.

Think about a frame sync living in a frame of modular products. It might have 50 or more adjustments and settings available to the user. That is no problem for a well-designed software user interface and certainly can be done on a stand-alone control panel. But it essentially cannot be done with controls on the cards themselves. Thus, some form of control system is an essential part of building a facility. The question becomes not whether a control system is necessary, for it may be unavoidable on a small scale, but rather whether a system that monitors and controls large portions of a facility is an inevitable choice.



WVIT's iControl servers and workstation support more than 100 frames and 900 cards of Miranda's Densité 2 and Densité 3 devices.

The implications of equipment choices have a lot to do with the decision. Every manufacturer of modular equipment has its own homegrown control and monitoring system. In addition, there are companies that specialize in monitoring and control systems, as well as specialized systems for satellite system control and ones that provide a degree of automation.

SNMP protocol

Many systems use the IT Simple Network Management Protocol (SNMP) protocol. SNMP offers a standard method for hardware manufacturers to provide access to monitoring and control of their hardware using interfaces built on a management information base (MIB).

There are wrinkles, of course. One server manufacturer, for instance, might provide access to information about power supply health and fan status in its MIB, while another might offer completely different information. However, with some qualifiers, it is true that SNMP offers reasonable information in a common application interface. IT hardware, including video systems designed on IT platforms, is much more likely to implement SNMP in a more complete manner.

Many manufacturers have recognized that although they would prefer that every item in a facility has their logo, the reality is that if a monitoring and control system is to be optimized from the user's perspective, it must connect with multiple manufacturers' hardware. This has led to one of two approaches. Either the control system must be capable of monitoring hardware from any manufacturer publishing an API or SNMP MIB, or the manufacturer must make a provision in the proprietary control system to accommodate connections outside of its own products.

IBM, HP, EMC and many other mainstream IT technology companies offer comprehensive SNMP packages. When combined with MIBs from broadcast equipment manufacturers, a significant portion of a facility monitoring system can be assembled.

But that is the hard part. The truth is that much of the baseband- and broadcast-specific IT hardware one might want to monitor is not covered fully by the MIBs generally available. Even when MIBs exist, there is often less than a full feature set available. As a result, it is often preferable to use a manufacturer's own monitoring product, and to the extent SNMP integration is offered, one can pull other devices into a holistic system.

Another approach is to window SNMP or other monitoring systems through a common control and monitoring interface on a proprietary system. Though less than ideal, this at least provides the capability to minimize the number of systems one must actively monitor and control.

Keys to effective control

The purpose of monitoring and control is to gather information about the operational status and health of the equipment in use in ways simply not possible in an environment without machine assistance. The rub is in how that is displayed and used. The best monitoring and control systems are ones that adapt to the status of the devices being controlled.

For instance, the system might show a general screen that looks like a schematic diagram of your system, with green indicators highlighting everything is working. When a failure occurs and a device turns red, you have to still be looking at the device to notice the fault. It is quite possible that in complex systems, many such screens are available displaying the status of hundreds of devices.

The key to an effective system is the way the system adapts and tells you that you should be looking at a particular screen due to an error just detected. It might, for instance,

bring that screen forward so you can see the error, or even zoom the section that is in fault condition to fill the screen. It may also send e-mail or text alerts to maintenance at the same time, notifying them of a serious issue that must be addressed. Just logging the error to a printer would not be useful, though a permanent log (electronic or paper) is always a good idea. That may allow you to quickly see errors that happen routinely and plan an approach to minimizing future problems.

Types of control solutions

Control systems in today's hybrid environment take many forms. Often hardware has embedded Web servers, allowing garden variety browsers to provide effective interfaces on computer screens. This is convenient, particularly when a lot of devices must be controlled. Embedded servers get around needing proprietary control software but sometimes at the expense of less information displayed. Many manufacturers still choose to build stand-alone control panels for repetitive tasks, like setting levels on frame syncs for ENG ingest. Control panels of this type are intuitive and uncomplicated. Usually they can be steered easily to many devices, often adapting their function and display to the module in use.

There was a time when large broadcasters took the bull by the horns and built their own custom control systems. Those days may be returning with at least one large company choosing that route, with router and device control brought to a common interface for the operator's use.

Lastly, though manufacturers would like to get you to buy their proprietary control and monitoring solution, it is sometimes better to approach a vendor that specializes in just this area. Using this approach may allow you to build a single system that can attach to a large variety of manufacturer solutions without prejudice. A Google search will turn up many stand-alone products intended for just this purpose. Their ability to provide best-in-breed solutions across a wide swath of interfaced products can be appealing. BE

John Luff is a broadcast technology consultant.

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Broadcast Engineering, April 2010, Vol. 52, No. 4 (ISSN 0007-1994) is published monthly and mailed free to qualified persons by Penton Media, Inc. 9800 Metcalf Ave., Overland Park, KS 66212-2216. Periodicals postage paid at Shawnee Mission, KS, and additional mailing offices. Canadian Post Publications Mail Agreement No. 40612608. Canada return address: Bleuchip International, P.O. Box 25542, London, ON N6C 6B2. POSTMASTER: Send address changes to Broadcast Engineering, P.O. Box 2100, Skokie, IL 60076-7800 USA. CORRESPONDENCE: Editorial and Advertising: 9800 Metcalf, Overland Park, KS 66212-2216 Phone: 913-341-1300; Edit. fax: 913-967-1905. Advert. fax: 913-967-1904. © 2010 by Penton Media, Inc. All rights reserved.

HPA tech retreat

If you're looking for another annual technology show to attend, consider this one.

BY ANTHONY R. GARGANO

Broadcasters and producers, program creators and filmmakers, station personnel, and post-production house staff worldwide convened once again at a warm and sunny desert location with palm tree-lined thoroughfares. NAB? Las Vegas? No, actually it was the annual Technology Retreat hosted by the Hollywood Post Alliance (HPA). This year's three-day gathering, actually four when you include the very presentation-full preday, was held in February at the Rancho Las Palmas Resort in Rancho Mirage, CA. This was the sixteenth year for the tech retreat, and like a fine wine, it just keeps improving with age.

The broadcasters panel at the recent HPA Technology Retreat included, from left to right, Bob Seidel, CBS; Art Allison, NAB; Rich Friedel, FOX; Tom Bause, NBC Universal; Bob Allen, KESQ; panel moderator Matt Goldman, Ericsson; and at the podium, Andy Butler, PBS.

Technology immersion

HPA applies an interesting organizational approach to its three days of total technology immersion. The day starts early with breakfast roundtables, where you can join in a lively discussion on the particular topic of your choice. Approximately 20 topics or more are offered each morning, and this year included many wide-ranging discussions, such as stereoscopic full HD 3-D to the home, file-based workflow, mobile TV and archiving in a post-videotape world, to name just a few.

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Each day's roundtable breakfast was followed by presentations and panels. These presentations were mainly technology-oriented, but sprinkled in were interesting non-technical sessions that included reports on the CES Show and consumer electronics trends, as well as FCC and legislative updates.

The presentations and panels offered something for everyone. Topics covered of specific interest to broadcasters included mobile TV and audio loudness issues. There was even a broadcaster panel session. For the film-oriented, there was everything from the latest 3-D shooting techniques to restoration of nitrate-based film classics, such as the 1928 debut of Mickey Mouse in "Steamboat Willy." The post-production community enjoyed technology updates on a number of subjects, including file-based workflows and collaborative networking techniques.

During session breaks and evenings, more than 50 technology demonstrations were conducted by almost as many companies. The most appealing thing about these exhibits is the HPA proscription against the space being used trade-show style for blatant selling activity. Participating companies were required to maintain the spirit of this being a technology retreat by truly limiting their presentation space to the demonstration of new technologies and techniques.

Attendance this year was up 10 percent over last year. In addition to the production, post and film communities, this year's attendees included satellite and cable programmers, as well as representatives from ABC, CBS, FOX, NBC and PBS. Attendees were from Europe, Asia and the United States and also included representatives from major industry standards bodies such as SMPTE, NAB and EBU.

The Hollywood Post Alliance Technology Retreat is becoming the go-to event. Next year's event is scheduled for Feb. 15-18 and will be once again held at the Rancho Las Palmas Resort. Mark your calendar. It's already on mine. BE

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

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