Concourse Engagement

Vivint Smart Home Arena creates an experience to add fans before, during and after events

SOUND & COMMUNICATIONS

COMMERCIAL AV TECHNOLOGY AND APPLICATION

Upgrading The Fan Experience

Philadelphia's Wells Fargo Center creates a modern, dynamic arena

Esports: Shifting The Sports Venue Landscape

Production companies, integration firms and consultants' perspectives for moving forward

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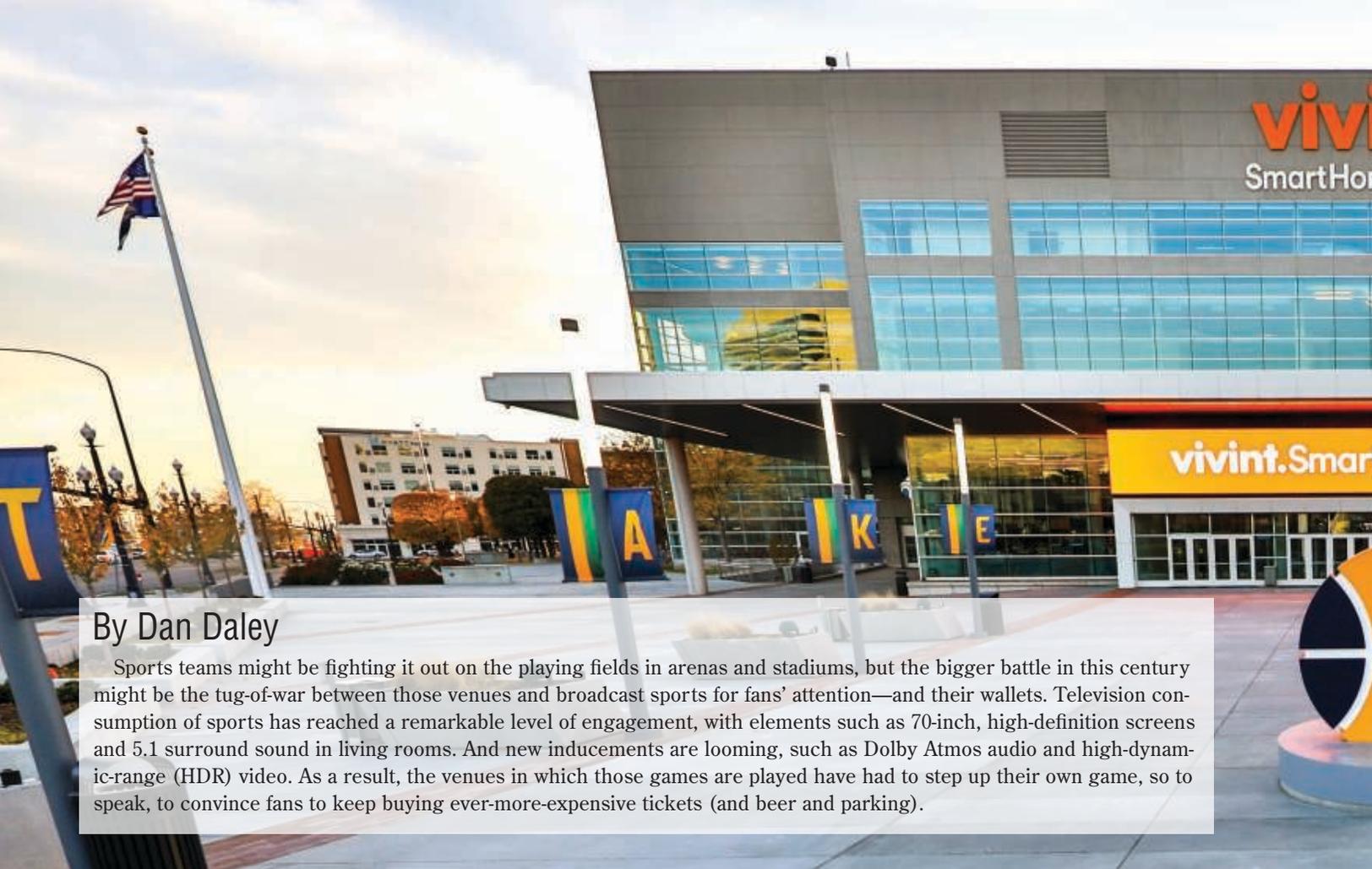
By Dan Daley

Sports teams might be fighting it out on the playing fields in arenas and stadiums, but the bigger battle in this century might be the tug-of-war between those venues and broadcast sports for fans' attention—and their wallets. Television consumption of sports has reached a remarkable level of engagement, with elements such as 70-inch, high-definition screens and 5.1 surround sound in living rooms. And new inducements are looming, such as Dolby Atmos audio and high-dynamic-range (HDR) video. As a result, the venues in which those games are played have had to step up their own game, so to speak, to convince fans to keep buying ever-more-expensive tickets (and beer and parking).

CONCOURSE

Vivint Smart Home Arena creates an experience

All the digital signage displays in the venue show sponsors' messages before the national anthem is played or performed. After the anthem, content is synched between screens in the bowl and in the concourses.

Tastefulness and functionality were top of mind when Vivint Smart Home Arena installed its roughly 600 video displays. As a result, the effect is complementary without being overpowering.

ENGAGEMENT

to add fans before, during and after events.
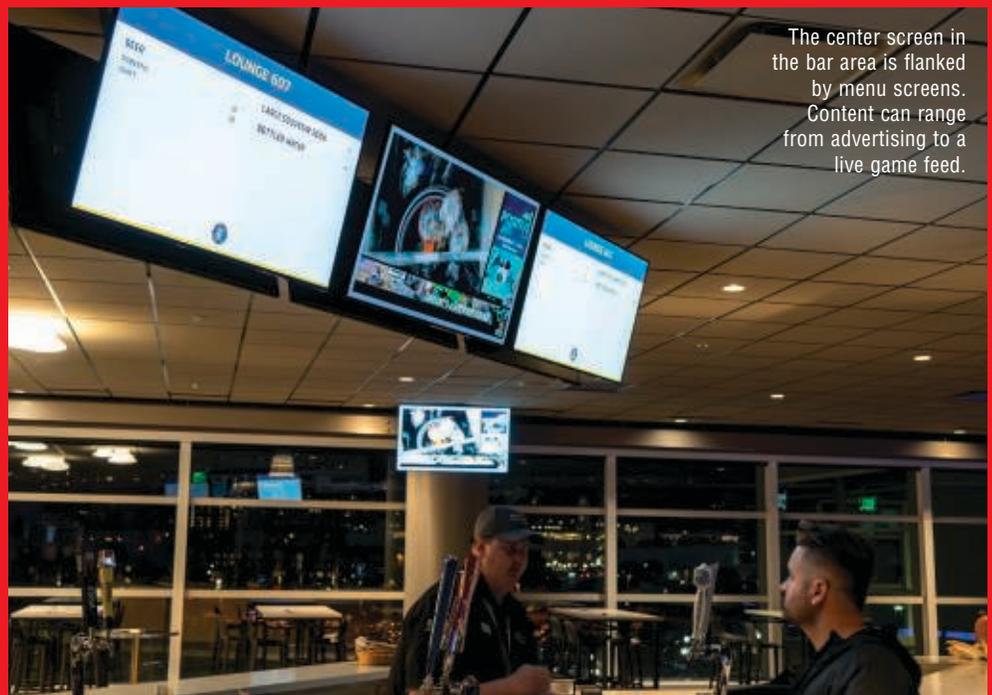
The center screen in the bar area is flanked by menu screens. Content can range from advertising to a live game feed.

Technology Serving The Fans

Given the Extron DTP twisted pair AV systems in several dozen suites surrounding the bowl and in a few "super" clubs at Vivint Smart Home Arena, we sought Extron's perspective on the underlying technologies and products that TVS Pro installed, which serve the arena's loyal and enthusiastic patrons.

The DTP Systems comprise an integration platform that supports 4K, accommodates a variety of video formats and provides all the components that are essential to building commercial AV systems. Because many installations require spanning long distances that are not achievable with native HDMI or DisplayPort cabling, the DTP products extend video, audio and control signals using up to 330 feet of shielded Catx cable. Twisted pair cable, which is comparatively economical, can be cut into custom lengths and terminated in the field.

In addition to point-to-point signal extension, the DTP products enable centralized AV switching and distribution, signal processing and system control to function as the AV system's heart. The designer can choose from a range of video switchers, from 2x1 up to 10x8 matrix configurations. DTP distribution amplifiers are in 1x4 and 1x8 sizes. All DTP CrossPoint matrix switchers and 4K presentation switchers feature Extron Vector 4K video scaling technology to convert incoming video signals to match the display's native resolution, facilitating fast video switching and high image quality. This technology incorporates bicubic scaling, 30-bit color depth and 4:4:4 chroma sampling. Vector 4K scaling ensures high image quality while preserving image and color detail from the original source material.

The DTP Systems include extender models in a variety of form factors and video formats. Products are available to support video formats such as HDMI, DisplayPort, DVI, SDI and VGA, at resolutions up to 4K. The DTP products have built-in video conversion to ensure compatibility between any DTP transmitter and any DTP receiver, regardless of video format, allowing designers to build streamlined systems without extraneous adapters or video converters. For situations where maximum signal extension is not needed, there are DTP transmitters, receivers and DAs with 230 feet of maximum signal extension.

To control remotely located displays and other video equipment, DTP products transport RS232 and IR signals, along with video, over a single twisted pair cable. Larger DTP switching products, such as the IN1808, IN1608 xi and DTP CrossPoint matrix switchers, have built-in Extron IPCP Pro control processors for an all-in-one solution. The IPCP Pro control processor delivers high-speed processing and abundant control port capacity for customizable control of the entire AV system. This includes all source devices and displays, plus lighting, window shades, projection screens and occupancy sensing.

The venue's 56 luxury suites are connected to Revel's digital-signage content-delivery platform, Channel Valet, a cloud-based platform through which content is created and managed for the client.

The initial front in that battle was the bowl, where ever-bigger video screens are buttressed by concert-level line-array sound systems and special effects, such as whiplash-inducing LED leaderboards that ring the mezzanines and video halos above. Most recently, however, venues, teams and leagues have been turning to the concourses and other back-of-house areas—and to the areas around the venue itself—in an attempt to deepen fan engagement before they even make it to their seats. An excellent example of that is found at the 18,300-seat Vivint Smart Home Arena, in Salt Lake City UT, the home of the NBA's Utah Jazz. There, a dazzling array of digital signage has capped a recent $125 million renovation of the facility.

"What's happening now is, the teams are realizing they need to bring fans to the venue for more than just the action on the court," Brian Fitzpatrick, President and CEO of Revel Media Group, said. The Salt Lake City-area AV integrator and design firm integrated most of the digital signage AV that was installed in the concourse areas in Vivint Smart Home Arena as part of that major renovation. He continued, "They were able to [wow in-person fans] in the past with really phenomenal bowl experiences, with big video screens and big sound systems. But now, the sports venue also has to be a place to hang out before, during and after the game. We're using AV to do that, too." He added, "The big push is to get fans here one to two hours before the game—to spend time and money—and to increase dwell time on the concourses, which increases the value of the [digital] signage for the advertisers."

In fact, Vivint Smart Home Arena now has 600-plus digital signage displays, including 27 videowalls, throughout the concourses and elsewhere in the venue; that technology complement creates a dynamic and cost-effective advertising environment that's as visually dazzling and engaging as the high-definition, 10-million-pixel LED video scoreboard above the center court. The newly integrated displays begin in the venue's 12,000-square-foot America First Atrium and extend throughout the redesigned lower- and upper-bowl concourses, where destination-dining restaurants are interspersed with retail, such as the Utah Jazz Team Store.

Lots Of Signage, Tastefully Done

The overarching goal, according to Jamie Galileo, SVP of Facilities at Vivint Smart Home Arena, was to update and modernize the concourses and other areas of the venue, while not overpowering them with technology.

The same 65-inch screens are used throughout, but they're configured as either landscape or portrait depending upon their installed location.

"The arena is an iconic part of Salt Lake City and it was built by a family," he explained, "so we wanted to keep it family friendly while also making the concourses more contemporary." Galileo continued, "Six hundred [video displays] is a lot, but not [when spread] over the amount of square footage here—and not the way they've been installed, which is very tastefully and functionally."

Digital signage, Fitzpatrick noted, is in high demand among arenas and sports teams. What sets apart its implementation at Vivint Smart Home Arena, he said, is the use of IPTV as the distribution platform, connecting Samsung displays using embedded system-on-a-chip (SoC) media players and running the Tizen operating system. This creates a system capable of instant, highly targeted messaging that can change as often as needed, and that only requires power and a dedicated local area network (LAN).

This approach, Fitzpatrick stated, is both technically elegant and hugely cost effective. "Traditionally," he began, "you'd have a media player or a set-top box at each display that delivers the content to the screen. Using networked IPTV and SoC eliminates all that." He estimated the savings from hardware elimination alone in the millions of dollars. "You're also eliminating thousand of potential points of failure by getting rid of the media players and the HDMI and RS232 connectors," Fitzpatrick added. It also helped reduce the amount of cabling used on the digital signage system, with just a single Cat6 connection to each display needed.

The Samsung displays come in an array of sizes—from 22

Revel Media Group Equipment

17	Cables To Go 40414 3.5mm M/M stereo audio cables (12')
17	Cables To Go 54402 DisplayPort cables w/latches M/M, 8K compatible (10')
5	Crestron CP3 3-Series control processors
1	Crestron PRO3 3-Series control processor
8	Crimson AV CA8XD extra-heavy-duty 8"x8" ceiling adapters w/cord management
8	Crimson AV CM3KIT-4V 3-display in-line menu board kits w/single pipe drops
8	Crimson AV EA35 adjustable-length extension columns (3'-5' drop length)
54	Crimson AV FP63A universal flat wall mounts in portrait orientation for 37"-75" screens
20	Crimson AV VW4600G2 video wall mounts w/Push in - Pop out technology
16	Global Caché IP2SL-P iTach TCP/IP to serial (RS232) devices w/PoE
3	Monoprice 2029 DVI-D single link male to HDMI female adapters
18	Samsung DB22D-P 22"-class full HD commercial LED monitors w/SoC players
92	Samsung DM65E 65" 1080p direct-lit LED displays w/SoC players
15	Samsung DM75E 75" 1080p direct-lit LED displays w/SoC players
8	Samsung DM82D 82" edge-lit LED displays w/SoC players
165	Samsung PM49H 49"-class full HD commercial smart LED TVs
326	Samsung PM55H 55"-class full HD commercial smart LED TVs w/SoC players
22	Samsung UD55E-A 55" direct-lit LED displays
23	SnapAV AN-110-SW-F-8 Araknis Networks 110 Series unmanaged+ gigabit switches w/front ports
100	SnapAV B4-HD-1 Binary B4 Series 4K ultra-HD high-speed HDMI cables w/Ethernet
21	SnapAV B4-HD-2 Binary B4 Series 4K ultra-HD high-speed HDMI cables w/Ethernet
16	SnapAV SM-FLAT-S Strong low-profile flat mounts
371	SnapAV SM-T-L Strong tilt mounts
23	SnapAV SM-T-XL Strong tilt mounts
54	SnapAV WB-300-IP-3 WattBox IP power conditioners (compact) w/OvrC Home (3 controlled outlets)
650	SnapAV WP-PC-CAT6-5FT-BLK Wirepath Cat6 Ethernet patch cables
22	SolidMounts SW-600 slim 1.69" articulating TV mounts (24" extension, 32"-65" TVs)
2	VITEC EZ TV Personal TV Middleware modules
2	VITEC EZ TV Platform Pro IPTV and digital signage platforms
2	VITEC EZ TV VOD/NDVR Server modules
2	VITEC MGEI-6000-D 4-channel HD/SD-SDI rear I/O blade interfaces
24	VITEC MGEI-6000-H 4-channel digital HDMI rear I/O blade interfaces
13	VITEC MGES 6000 broadcast-quality HD/SD H.264 quad-input IPTV encoders
13	VITEC MGES 6000 TS broadcast-quality HD/SD H.264 IPTV encoding blades
2	VITEC MGW-5100 element management software
2	VITEC MGW-1000 IPTV carrier-grade AC platforms

List is edited from information supplied by Revel Media Group.

Menu board signage is used throughout the concourses, informing guests not only of food and beverage options, but also of upcoming performances and game information.

inches to 82 inches—with the majority of them being the 65-inch QM65H model; all of them have an integrated SoC player. The displays are mounted using a variety of mounts from SnapAV, Crimson AV and Solid Mounts. Fitzpatrick said the variety of applications—from menu boards to retail—dictated the need for many types of mounts.

Fitzpatrick said the scale of the IPTV deployment and a short timeline were the two main challenges that the team encoun-

TVS Pro Equipment

3   Apple iPads
140 Arlington TVB613 recessed TV Boxes for power and low voltage
5   Cisco SG300-28PP 28-port gigabit PoE+ managed switches
8   Crown DCi 8|600DA 8-channel, 600W @ 4Ω power amps
2   Extron DTP CrossPoint 84 4K 8x4 seamless 4K scaling
        presentation matrix switchers
2   Extron DTP CrossPoint 86 4K 8x6 seamless 4K scaling
        presentation matrix switchers
4   Extron DTP HD DA4 4K 4-output DTP distribution amps
4   Extron DTP HD DA8 4K 8-output DTP distribution amps
30   Extron DTP HDMI 4K 230 Rx DTP receivers for HDMI
70   Extron DTP HDMI 4K 330 Rx long-distance DTP receivers
        for HDMI
18   Extron DTP T UWP 4K 232 D 2-input DTP transmitters for
        HDMI and VGA w/audio embedding – decorator-style wallplates
4   Extron IN1608 IPCP MA 70 presentation switchers w/control
        processors and 70V mono amps
4   Extron IPCP Pro 550 IP Link Pro control processors
12   Extron MLC Plus 200 MediaLink Plus controllers
21   Extron TLP Pro 725M 7" wall-mount TouchLink Pro touchpanels
5   Extron XPA 2001 mono 70/100V amps (200W)
12   JBL Control 126 WT premium in-wall speakers
35   JBL Control 19CST in-ceiling subs
440 JBL Control 47C/T in-ceiling speakers
120 JBL Control 65 P/T compact full-range pendant speakers
8   SoundTube XT850 8" coaxial outdoor speakers
6   Stewart Audio FLX80-4-CV-D 4-channel amps
List is edited from information supplied by TVS Pro.

tered for the project. Due to the start of the NBA season, the entire renovation project, which included 78 subcontractors, had to be finished in just the 129 days between the end of the 2016-2017 NBA season and the start of the following season. "We got about five weeks of that, and we needed every minute [of it] because no one had ever done a full SoC IPTV digital signage deployment in a sports arena before," he explained. "And, on top of that, we were doing things that aren't usually done in IPTV systems, such as allowing some of the displays to be able to change channels locally…in the suites, for instance."

A Whole New Ballgame

The AV deployment extends to the venue's 56 luxury suites, and executing the task involved working with partner contractors and using Revel's own digital signage content-delivery platform, Channel Valet. That's the cloud-based platform through which Revel creates and manages content for its clients. The IPTV deployment was further enabled by firmware updates to Samsung's SoC technology, which helped with content management. "We worked with Samsung to optimize the new firmware for this deployment," Fitzpatrick confirmed.

As programmed now, all the digital signage displays in the venue show sponsors' messages before the national anthem is played or performed; after the anthem, content is synched between screens in the bowl and in the concourses. In addition, some videowalls are reconfigured; for instance, a 3x1 wall shows sponsor messages before the game, but, during the game, although two of the screens continue to display advertising, one displays a feed of the game from the bowl. Other videowalls are located in the venue concourse's "Home Court" areas and a series of displays runs a variety of NBA content.

Integration Process

If Vivint Smart Home Arena's concourses resemble retail and hospitality environments, the venue's renovated suites and clubs, as well as the coaches' and players' areas, now have AV

data connections and reliable video streaming will drive customers to buy 5G-equipped phones. Automobile manufacturers will look for 5G connections to operate "smart" functions and even autonomous vehicles. Voice-control systems such as Alexa and Google Assistant might add 5G support, letting them work just about anywhere there is a network connection.

Some industry executives have gone so far as to say that 5G will make Wi-Fi obsolete. Verizon is already selling a 5G home terminal that uses Wi-Fi connectivity for inputs, and it's planning to launch a video-streaming service to compete with the likes of Comcast. You'd use a conventional high-speed Wi-Fi link from any home device with an Internet of Things (IoT) connection into the Verizon 5G Home modem, which would then use a 5G cellular connection into the Verizon network.

In this way, the local wireless connection would look the same as it does now. All the magic would then happen "in the cloud," and I suspect most customers wouldn't be concerned with details beyond how much the service would cost monthly (between $50 and $70 right now, based on news stories). It's conceivable that, by 2020, we would see many commercial, educational and residential customers drop wireline broadband services and opt for 5G, if the networks deliver on high-speed data and near-zero latency promises (less than 1ms).

And what does this have to do with our industry? *Everything,* as the emphasis will be on content acquisition and delivery. An increasing number of schools at all grade levels are delivering lessons and content using YouTube channels, whereas businesses rely on video communications for everything from shareholder meetings to employee-orientation sessions, press releases and sales presentations. With just about everyone owning a smartphone, it would make sense to have these devices and their cloud-stored content on the same network (one that would also work internationally, by the way).

The "in vogue" term for people who drop cable TV service and choose streaming video, supplemented by free over-the-air TV broadcasts, is "cord cutting." That could also be applied to customers who will switch from expensive, wired broadband plans to 5G.

If it really works as planned…. ◫

and control aspects that would feel completely at home in a corporate or event milieu. Several dozen suites surrounding the bowl on several floors—and four so-called "super" clubs, such as the Jazz 100 Club and the Lexus Club—all have Extron DTP twisted-pair AV systems controlled via an Extron IP Link Pro control system, with seven-inch Extron TLP Pro 725M wall-mounted TouchLink Pro touchpanels to provide a consistent user experience.

"Someone could walk from one club to another, or a player could go from the players' lounge to the locker room, and [they would] be able to control the televisions and the speakers in the exact same way," Brent Parker, a Sales and Design Engineer at TVS Pro, the pro-audio division of TV Specialists, Inc., said. The Salt Lake City-based integrator installed the DTP and control systems in those areas of the arena. This part of the project, Parker added, was because of an earlier experience with a different control system, which had been in place prior to the renovation. "Before, if someone had to change out a television or a Blu-ray player, they had to call in a certified programmer, too," he explained. "With the Extron Pro Series control system, their own in-house AV technicians can do those kinds of [component] replacements, without having to reprogram the control system. It's much easier for them."

Elevating the user experience is at the heart of Vivint Smart Home Arena's renovation. Parker pointed out that the venue has fewer seats than it did before the overhaul process—about 18,300, as compared to the 19,900-plus it seated before—but that the upgraded experience in the new suites and other events areas are intended to offset any revenue diminution related to ticket sales—and, potentially, to increase overall, facility-wide revenue.

Dalton Parker, Project Manager and Lead Automation Programmer for TVS Pro (and the son of Brent Parker), said timelines/schedules and value engineering were challenges throughout. With respect to schedules, for instance, he recalled that certain ceiling speakers (there are more than 600 speakers in the system…mostly JBL ceiling and pendant types) that are painted to match one style of tiles had to wait for those tiles to arrive before they could be installed. In addition, midpoint cost reductions narrowed the original video matrices in the suites from 32x32 to 8x4 or smaller. "It was scaled back from one-to-one routing to having to put a VITEC IPTV tuner behind each of the eight to 11 televisions in each area," Parker said. "It still provided the feel of a large-scale matrix—of being able to route any video signal anywhere—but it required manual tuning."

Electrical contractor Cache Valley Electric (CVE) installed the Cat5 and Cat6 structured cabling, whereas TVS Pro put in what Brent Parker estimated was about 17,000 feet of speaker wire and another 3,000 feet of control wiring. That's in addition to the television tuners the team connected to the cabling that CVE ran from the IPTV system, as well as VGA and HDMI inputs in the suites. In addition, the entire arena's audio is running on a Dante network that lets each club and suite pull in audio from the arena's PA system; as a result, the real-time sound of the game (versus the broadcast-audio feed, which is also available) can fill the suites. That same Dante network allows broadcasters to plug a microphone into XLR input panels in the coaches' interview room to send audio from interviews out to network feeds. "It's a very versatile system for audio," Dalton Parker affirmed. "They can also send the bowl sound out to the patio around the entrance to the arena to extend the activity inside to people waiting to get in."

It's possible, Brent Parker said, that many of those enjoying the suites are

encountering the same AV and control platform they're also using in their offices, as well as in their meeting and event spaces. "The percentage of corporate users has increased among all the people who come to the games, so they'll probably be pretty familiar with a lot of it," he stated.

Although the action on the court remains the focus in sports venues, the concourses that surround the court are having new emphasis placed on them. And, as those concourses become retail, food and entertainment destinations in and of themselves, their AV increasingly reflects that emphasis. "This is not," Fitzpatrick concluded, "what a sports-venue project would have looked like even a few years ago."

SIGN AGE: LOCKER ROOM VIDEO: YELLOW JACKETS' NEW RECRUIT-ATTRACTOR

A TriplePlay TripleChoice Education Portal allows for the control of the TriplePlay system and all IPTV set-top boxes, whereas a Crestron control processor and 10-inch touchpanel act as the user interface for control of the individual displays (power, channel, volume) and the sound system (source, volume).

Content for the system includes cable television channels, locally encoded channels and digital signage channels, which primarily act as digital bulletin and message boards for the players. A local HDMI input under several of the displays also allows coaches to input a laptop or other local source directly into the display for additional content.

"The new AV system provides a high-tech feel and finish to the Yellow Jackets' locker room and provides Georgia Tech with the ability to expand," Volk said.

As with most large AV systems, digital signage is a key part of the total digital media distribution system. That's why it is necessary for the AV integration team to work collaboratively with both the IT and Security teams. As with most other digital signage projects, clear and regular communication with all stakeholders throughout the design and deployment process is key to long-term customer satisfaction.

With increased television and social media exposure at all levels of collegiate and pro sports, the locker room has become even more of a focal point for fan and management attention. This, in turn, has created significant and interesting opportunities for designers and integrators with the right team spirit.

THE COMMISH: POWER-UP SEQUENCES: IT'S NOT JUST ABOUT STOPPING THE POPS

processor didn't get the memo, users thought there was something wrong with the display? System initialization is a big deal in today's systems.

The good news is that there are plenty of solutions available to avoid these communication glitches. IP-controlled power strips not only give you a way to monitor and cycle power to devices remotely, but they also offer power-up and power-down sequencing on all outlets. So, the audio and video processors can be powered on immediately; the control processors can be powered on after 92 seconds; and the amplifiers can be powered on after 127 seconds, just to make sure the system is safe and properly communicating. Additionally, the outlets can be labeled in the graphical user interface (GUI), so you don't even have to look at drawings to figure out which outlet drives the mixer (as long as someone confirms the accuracy of the labels—but that's a different checklist item).

Much like humans, systems require warm-up routines to start off the day right. As the communication between devices becomes more complex, we must confirm that the system can start in a known, good state. One of the first steps we perform during commissioning is to cycle power to the system and begin testing on a clean slate after the system comes on line. If it boots up and can be operated quickly and easily, we are in great shape. The start-up routine is functioning well.

In those instances, there will be no need to dash down the block with a toddler over one shoulder, yelling to neighbors about whether the school bus already passed by.

WHAT WOULD YOU DO?: WHO OWNS THE CODE?: LOCKED UP TIGHT, OR A FREE-FOR-ALL?

to do that," when I asked him about broader, longer-lasting coverage.

Of course, I disputed that point of view to no end. First, no matter how much—or how little—the integrator makes, the client is paying for that firm to write the code and install it in its space. Why should the client have to pay for it again? "Intellectual property," my friend replied. He really believed that the client was not entitled to use the programming code as it saw fit…that it should be locked up—unless the client arranged in advance for transparency and paid for it.

Ultimately, he said, this was someone else's job and he could not help. Alternatively, he suggested having the client get in touch and request a service call. Although that conversation ended my involvement—I told my consultant friend I could not help to obtain the code—it really irked me. I mean, how many people know to ask upfront to have the programming code included in the required close-out documentation? I would say almost none!

I called around to find out what others are doing, and I will follow up with a future article about this. In fact, I want to involve all the integrators reading this, so I can find out what you're doing. Please answer this two-part question: Do you provide the uncompiled programming code at project close-out? Why or why not? I will select a few of the responses and highlight them.

Contest time! All integrators who respond will be entered into a drawing. The lucky winner will receive a can of Virginia Diner Peanuts! Contact me at dkleeger@testa.com.