A SUPPLEMENT TO SCN MAGAZINE

THE INTEGRATION GUIDE TO AVOIP

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When choosing an AVoIP system, focus on resolution, image quality, latency, and power consumption.

Beyond the Buzzword

Integrators Weigh Important Options for AVoIP Installations

By Jennifer Guhl

Let's face it: As an industry buzzword, AV-over-IP is often used as an overarching term to cover many diverse technologies. It's no wonder that many AV customers—and the professionals that serve them—find it confusing. Before your commit to an AVoIP installation, here are some important areas to consider and clarify.

First, it's important to convey that there is no "one-size-fits-all" AVoIP solution. Steven Barlow, president of DVIGear, said many people overcomplicate the physical architecture of AVoIP systems. "For the majority of systems, it's simply a matter of choosing the appropriate size network switch and then adding an endpoint for each source and display device. Everything beyond that is done in software," he explained. "The system will deliver the most value when its capabilities are leveraged as much as possible."

Budgets and Bandwidth

Budget is always a good jumping-off point, as it can help determine the system's capabilities and infrastructure. When choosing a system, experts advise focusing on resolution, image quality, latency, and power consumption. "Don't be shy to compare products and make manufacturers prove the capabilities, serviceability, and image quality," said Paul Harris, CEO and CTO with Aurora Multimedia.

There is also a correlation between needs and budgets. "Low latency and the highest quality require a lot of bandwidth," said Joshua Rush, chief marketing officer for Audinate, which is known for its Dante AV solutions. "But if you're streaming content to YouTube, you can choose a lower-cost, lower-bandwidth solution because of the higher compression requirements."

Bandwidth can also impact cost, with infrastructure requirements becoming much more expensive as bandwidth needs increase. For example, if you're looking for a 10 Gb solution, your cabling will become more complex compared to a 1 Gb solution—and what is required will become more specific. A 1 Gb solution can also allow you to use existing infrastructure more often than a 10 Gb solution. There may also be additional fees to certify cabling to guarantee it will support 10 Gb

SCN SYSTEMS CONTRACTOR NEWS

CONTENT
Content Director Mark J. Pescatore, Ph.D.
mark.pescatore@futurenet.com

Senior Content Manager Wayne Cavadi

Contributor Jennifer Guhl

Art Editor Rob Crossland
Efrain Hernandez-Mendoza

Production Managers
Nicole Schilling, Heather Tatrow

ADVERTISING SALES
Managing Vice President of Sales, B2B Tech
Adam Goldstein, adam.goldstein@futurenet.com

SALES
John Casey, *john.casey@futurenet.com*
Janis Crowley, *janis.crowley@futurenet.com*
Zahra Majma, *zahra.majma@futurenet.com*
Debbie Rosenthal, *debbie.rosenthal@futurenet.com*
Andi Tureson *andi.tureson@futurenet.com*

FUTURE
SVP, MD, B2B Amanda Darman-Allen
VP, Global Head of Content, B2B
Carmel King

MD, Content, AV Anthony Savona

Managing VP of Sales, B2B Tech
Adam Goldstein
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FUTURE US, INC.
130 West 42nd Street, 7th Floor
New York, NY 10036

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Effective AVoIP deployments rely on adequate network infrastructure.

installations and beyond.

"Everything has to be perfect for the 10-gig plus solution to perform how I want it to," offered Keith Yandell, VP of innovation with AVI Systems. "Whereas a 1-gig solution can weather some poor cable quality a little better."

Avoiding Traffic Jams

Even the term "streaming video" can be confusing, with many equating the term to services like Hulu or Netflix or media players like Roku. Audinate feels AVoIP is a more accurate description of their offerings. "We transport high-quality content with extremely low latency within the room, like a church sanctuary or lecture hall, out to an overflow room—or bring audio and video into the computer, which then streams to remote participants," said Rush.

The industry is also fighting against many other assumptions about the technology, such as it's more complex than point-to-point connections, as well as security fears about allowing AV devices to talk to cloud services. "Some people still wrongly equate 'network' with Wi-Fi signals dropping out and having to reboot their home routers, so they don't have confidence that networked AV solutions are reliable," said Rush.

Another thing to remember is the importance of a properly configured network that can handle multicast traffic, which many customers struggle with because they outsource their route switch environments. Knowing there is nuance to multicast traffic is important to ensure you don't encounter issues when launching the system. "We'll hear, it's ready, we're fine," said Yandell. "We'll deploy a solution and crash their network because they didn't set it up correctly."

Network typology and setup can also be challenging, and configuring the various brands requires education to know which IP devices work well together. "It is not as simple as plugging the CAT cable or fiber into the switch," said Harris. "A person needs to understand the movement of data over the uplinks, PoE requirements, VLAN, unregistered multicast, jumbo packets, QOS, and much more. At the end of the day, you can make an AV-over-IP product easy to use, but the network switch and cable integrity are key."

Even though any new technology or approach can be scary for those with limited experience, network-based solutions are the way forward and have been considered reliable by most for quite some time now. With comprehensive training and expanded service offerings, the industry will break down some of the confusion concerning AVoIP, leading to more successful adoption by all.

AVoIP Innovators

Through Audinate's leadership in the space, there is now, more than ever before, a massive interoperable ecosystem, making it easier to find interoperable audio and video devices for every application. Based on common IT standards, Dante devices from any manufacturer can run alongside data traffic on networks comprised of conventional switches and cabling.

"Unlike proprietary methods of solving the challenges of AV-over-IP that can become outdated with evolving Ethernet standards, Dante's approach allows it to adapt to new networking technologies and bandwidth requirements," said Rush.

The industry has become very familiar with Dante's tools, which support everything from single-room systems to large-scale deployments. This has helped with the overall adoption of AVoIP due to its ability to be proven to run at scale and operate as a good network citizen.

Known as one of the largest ecosystems in the Pro AV industry, HDBaseT provides increased options for installers and system integrators, offering secure and long-reaching AV signal distribution. It is known for easy setup, maintenance, and

From left, Steven Barlow, Paul Harris, Joshua Rush, Keith Yandell, Effi Goldstein, and Nick Mariette

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troubleshooting, which makes it easy for many users to navigate.

Plus, with a large install base and the fact that it is embedded within many devices like projectors, screens, and PTZ cameras as a native connectivity port like an HDMI or USB interface, it operates as plug and play. "As AV becomes so deeply entrenched in our workflows, these aspects become very important when choosing a connectivity technology," said Effi Goldstein, president of HDBaseT.

NDI, which allows users to move high-quality, real-time video, audio, and bidirectional metadata over standard Ethernet networks without cumbersome point-to-point cabling, has become a popular choice in the AVoIP spectrum. Unlike many other AVoIP technologies, it operates entirely in software without reliance on hardware. Many AV technologies, including cameras and broadcast and software tools, support NDI I/O.

"Many of these tools are adaptable for use in cloud environments," said Nick Mariette, director of product management at NDI. "For basic functionalities, such as screen capture, monitoring, or even NDI Bridge—which allows you to transport NDI between software or hardware tools located in separate networks, including WANs or the Internet—there is likely an NDI tool available to meet the need."

NDI recently introduced its latest upgrade, NDI 6, which adds 10-bit color depth, marking a first for the platform. "NDI 6 marks a significant enhancement in video quality by upgrading NDI transport from 8-bit color depth to higher color depths that now support formats such as NDI High Bandwidth and HX3, which offer 10bit quality," Mariette added. SCN

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At Issue

What is the biggest stumbling block for many organizations trying to adopt an AVoIP workflow?

Vincent Philippo

Executive Director, International Sales, WyreStorm

People fear change. One of the biggest stumbling blocks for organizations adopting an AVoIP workflow is the new concept of depending on IT networks for AV distribution rather than traditional point-to-point transmission using matrix switchers. AVoIP demands robust networks capable of handling high bandwidth and low latency for quality AV streaming. Often, this requires certain upgrades or optimizations to existing infrastructure. Additionally, there is a need for ongoing education about AVoIP technologies, ensuring end users can effectively manage and troubleshoot these systems independently. WyreStorm is dedicated to helping organizations navigate these challenges, offering comprehensive support and advanced, user-friendly AVoIP solutions to streamline this transition and enhance efficiency.

Paul Harris, CEO/CTO

Aurora Multimedia

The biggest stumbling block for many organizations trying to adopt an AVoIP workflow is the ownership and configuration of the network switch. While many organizations prefer to use their own in-house selected brand, the liability for the operation is typically the integrator. When it is an owner supplied and configured switch, it limits the ability for the integrator to support the AVoIP solution, as they will be limited to the end points when it comes to troubleshooting. Ideally, the integrator should supply the switch and the network switch should be treated like it is the matrix of the system.

Mark Bohs

Director of Sales, Datapath (Americas)

For those adopting AVoIP for the first time, three considerations take precedent: network, training, and security. Networking infrastructure needs to be up to the task. You cannot expect a system handling vast quantities of video data to run efficiently on dated infrastructure. AVoIP is only going to increase and having networking fundamentals which can cope with future demands is important. Secondly, users need to be comfortable and familiar with the technology they are using. Expect dedicated support and training from your provider and take advantage of any commissioning support services offered. Finally, users need to be assured that their content is "network safe." TLS and other military-grade, dual-end encryption ensures that content is seen where it is needed and nowhere else.

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A Safe Port in a Network Storm

Learn how to deliver the best AV experiences via AVoIP

The AV industry is rapidly evolving and AVoIP is playing a pivotal role for the future of AV Integrators. Discover how to capitalize on its growth.

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Steven Barlow

President, DVIGear

One of the biggest stumbling blocks today has been the reliance on legacy system design principles and assumptions when implementing new AVoIP systems. With modern standards, most new system designs should be very straightforward. For example, using SDVoE, there is no need to manage channel numbers, IP addresses, multicast groups, or other static configurations—these are all automated and abstracted away via the API, allowing the use of dynamic hostnames instead. System design is as simple as connecting endpoints for every AV device in the system and configuring everything else in software.

Josh Petru

Director of Sales Support, Hall Technologies

The biggest stumbling block for many organizations attempting to adopt an AVoIP workflow is the lack of understanding and expertise in network infrastructure. AV professionals often face challenges in integrating AV with existing IT infrastructure, leading to compatibility issues and performance concerns. Successful adoption requires collaboration between AV and IT teams, along with a thorough understanding of network protocols and bandwidth requirements.

Cynthia Menna

VP and General Manager, AV, ADI Global Distribution

Every AV project will have a different level of needs and expectations. Discovery and negotiation of those cybersecurity requirements is the next great challenge for AV integrators. Integrators will want to be prepared with a plan for password protection, ports requirements, networking strategy, IP address setup, update strategy, and more. ADI offers a Systems Design Support team of industry experts who have experience solving application challenges every day, so we are available to assist.

Courtney Mamuscia

Senior Director of Marketing, RGB Spectrum

Organizations trying to adopt an AVoIP workflow often encounter the complexity of integrating new technologies with existing infrastructure. This transition involves navigating network configurations, ensuring compatibility with legacy systems, and managing bandwidth requirements to prevent latency and maintain quality. Additionally, organizations face a steep learning curve as they train staff on new protocols and troubleshoot interoperability issues. RGB Spectrum addresses these challenges by focusing on simplifying operations and enhancing ergonomics. Our solutions consolidate multiple keyboards and mice into a single keyboard and mouse for all applications, and replace multiple single-image displays with fewer multi-image displays. This results in improved operational efficiency, streamlined workflows, reduced operator fatigue, and better decision-making, faster.

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Taft Stricklin

Chief Sales Officer, Just Add Power

As 4K has reached near ubiquity, being able to reliably and natively transmit those signals at scale and with the right features is important. In the past, the biggest hurdles were limited system size, infrastructure, and cost. For organizations that could afford it, they were locked into one of two solutions—an AV matrix or a transmitter/receiver set that didn't have all the right features for the application. Now, new 4K video-over-IP transmitters and receivers with features such as USB-C, KVM, HDMI loop-out for AES67 audio systems, tiling, and warping are built for the wide breadth of AV projects requiring 4K—video walls, digital signage, command-and-control centers, and more. This allows organizations to build a much more modular and flexible AV-over-IP system that can grow and scale as needed in the future. In addition, organizations will see greater ROI because they don't have to rip and replace an entire system, which can cause disruption and downtime and greatly impact the AV experience. They can add more screens and sources of any resolution at unlimited scale just by adding a receiver to a display and/or a transmitter to a source with the features they need.

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Aurora Multimedia VPX-TC1

The VPX-TC1 Pro provides one of the most advanced 1G IP streaming solutions on the market utilizing Aurora's new Mimix CODEC technology. Mimix compression allows for near perfect reproduction of video and graphic images at resolutions up to 4K60 4:4:4 over 1G networks. It has sub-frame (1.78ms) latency and seamless switching for fast, lag-free content. Power consumption is important, as the VPX-TC1 uses as little as 8 watts.

Hall Technologies VERSA-4K

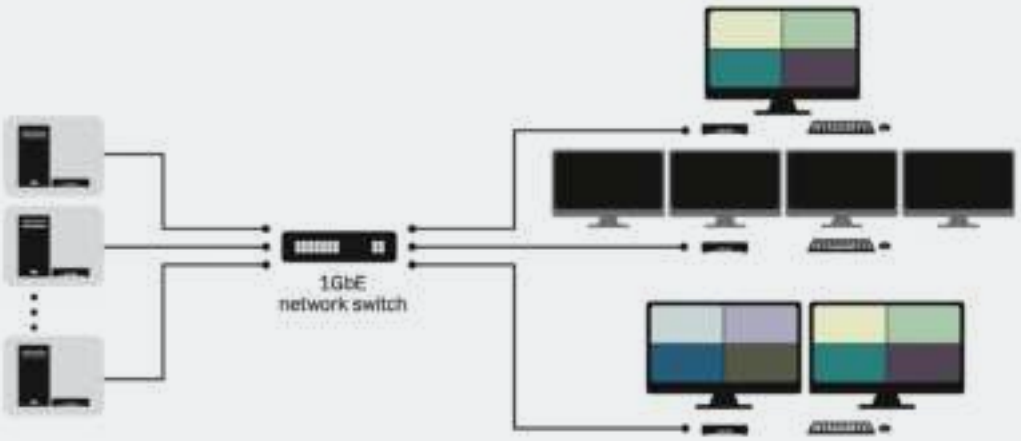
Hall Technologies VERSA-4K is a Video-over-IP solution designed for seamless transmission of high-quality 4K video content over existing network infrastructures. With its advanced encoding and decoding capabilities, VERSA-4K ensures unparalleled clarity and reliability in AV distribution applications. Its intuitive interface and flexible deployment options make it the ideal choice for conference rooms, classrooms, and digital signage installations, enhancing the way organizations share and display visual content.

Datapath Aligo TX100

The Aligo TX100 is a highly scalable transmitter that can ingest a single 4K source or up to four independent HD sources for IP distribution to any suitable endpoint in an Aetria solution. Each source also has a dedicated USB connection for independent KVM control. In parallel to the visually-lossless stream of each connected source, Datapath's SQX technology provides a simultaneous compressed stream for transmission across lower-bandwidth networks, if required.

DVIGear DN-300H

The DN-300H is the newest model in DVIGear's DisplayNet family. Based on the latest SDVoE ASIC technology, it delivers an unprecedented level of functionality and versatility in an ultra-compact, low-profile form. This unit provides switchable transmitter and receiver functionality, both for 10G copper and fiber network interfaces. The DN-300H optimizes KVM support by allowing instant switching of USB HID devices. Advanced software features and a low price point ensure high value for integrators.



RGB Spectrum XtendPoint

RGB Spectrum's XtendPoint KVM solution simplifies control room operations by consolidating multiple keyboards and mice into a single, streamlined interface. It supports multiple displays, creating a "single pane of glass" experience for enhanced ergonomics and efficiency. Designed for real-time control and monitoring, XtendPoint reduces clutter, improves workflow, and minimizes operator fatigue. This innovative solution ensures seamless integration, superior performance, and faster, more informed decision-making in mission-critical environments.

WyreStorm NetworkHD 500s Series

Discover the NetworkHD 500s series, an HDMI 2.0 AV-over-IP solution that delivers 4K60 4:4:4 @ 8-bit encoding over a 1 Gbps network. It supports Dolby Vision, HDR10, and HLG—and features both Ethernet and Fiber outputs, allowing content distribution to almost 1,000 feet with OM3 fiber cabling. Enjoy ultra-low latency, rapid matrix switching, and versatile routing of audio, video, USB, and control signals. Create expansive video walls with up to 256 screens using the NetworkHD Touch app or Pro Controller. With PoE and advanced security protocols, the NHD-500 system truly modernizes AV signal distribution.

ADI Global NETGEAR M4350

With solutions supporting 1Gbps to 25Gbps, the NETGEAR M4350 series of managed switches are engineered and certified for AVoIP with dedicated service and support. The M4350 solutions effectively increase bandwidth on a network and can cascade to other network devices through the uplink port to expand an existing LAN.

Just Add Power MC-QX MaxColor 4K60

The MC-QX MaxColor 4K60 Tiling and Warping Transmitter combines Just Add Power's MaxColor 4K60 features with its innovative tiling and warping technology. It allows 4K60 source devices to be displayed on a single screen instantly along with Warp Engine's source rotation capabilities. Users can watch four 4K60 video sources simultaneously in multiple formats, including single-screen, video wall, or tiled video. Further, installers can rotate any source in a Just Add Power system in 0.1-degree increments in real time with incredibly low latency. The rotated image can then be sent to an unlimited number of receivers in the network, allowing for the creation of massive artistic video walls.