



Corporate

Headquarters
+32 4 361 7000

North & Latin America

Headquarters
+1 947 575 7811

Asia & Pacific

Headquarters
+852 2914 2501

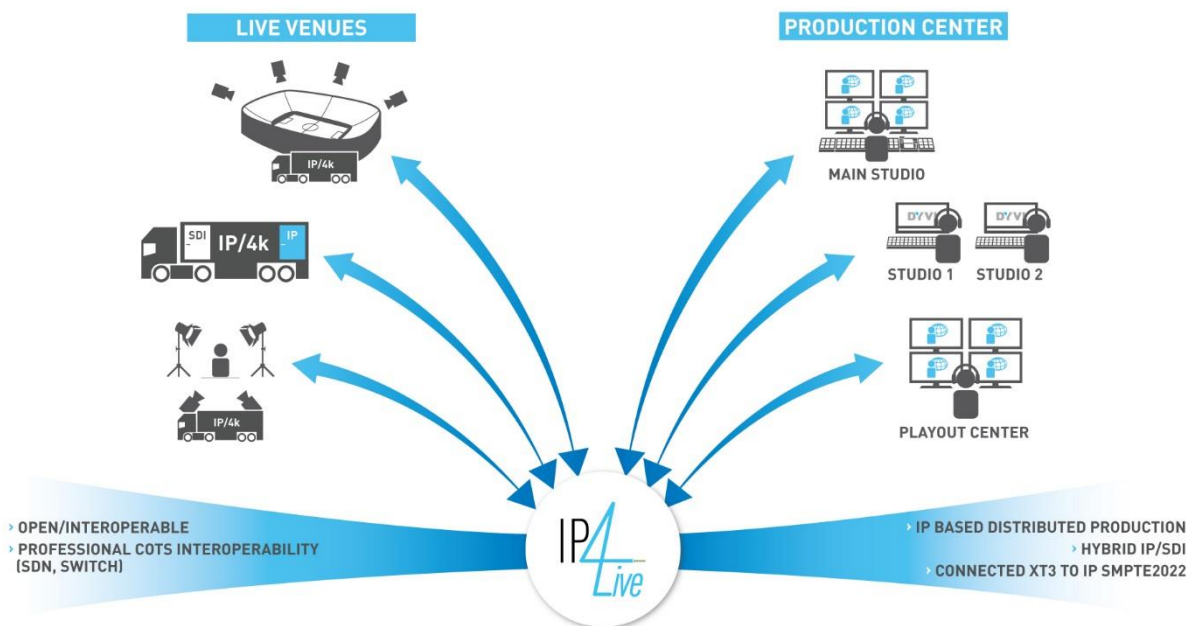
Other regional offices

Available at
www.evs.com/contact

Over the past few decades IP has been adopted by many industries: analog TV has been replaced by IPTV and OTT solutions, analog phone lines have been replaced by digital lines and voice over IP applications like Skype.

In the broadcast world, IP has been in use for quite some time: in file-based workflows, in post-production, and for content contribution and distribution. The heart of live production, however, has long been seen as the last frontier. But there has also been dramatic change on this last frontier over the past few years, and IP/IT-based solutions for live production are emerging. It's clear that this trend will continue and intensify: **IP/IT based approaches are here to stay for live production.**

The benefits of embracing IP for live production have become tangible:	
>	Broad benefits from tapping into a larger industry – the IT community is orders of magnitude larger than the broadcast market – meaning more qualified engineers, more solutions and more investment
>	Paired down infrastructure compared to the excessive wiring of traditional systems and the rapidly shifting standards being considered like UHD/4K and beyond
>	Cost optimization - the use of COTS (commercial off-the-shelf) equipment provides better economies of scale compared with proprietary solutions
>	Uniformity and synergies – the same infrastructures can be used for multiple workflows, allowing us to move beyond the use of dedicated wires for each type of signal being used
>	Agile, scalable and future-proof – IP/IT-based infrastructures are flexible, designed to scale and capable of handling any new format, even the ones not known today, as long as the information can be encapsulated in Ethernet packets.



IP4Live is EVS' strategic approach supporting and leading the transition to IP/IT-based infrastructures for live production. Our "pragmatic innovation" and proven track record are helping customers migrate to IP in a way that's smart, strategic and cost effective.

The program consists of new solutions – including new products and workflows – thought leadership on strategic directions for successful transition to IP-based production, and proven reference designs for IP/IT-based production infrastructures.

NEW SOLUTIONS

As part of the *IP4Live* program EVS is introducing **new solutions**, including innovations like the DYVI platform and the XiP gateway, making improvements to existing products like MultiReview, and fundamentally developing new approaches such as remote production and multiple concurrent workflows that share the same infrastructure.

EVS' MultiReview solution uses entirely IP-based networking to enable access, review and control of multicam angles and feeds, allowing operators to make critical decisions on the fly. The XiP SDI-to-SMPTE2022 gateway enables existing SDI-based equipment to be used in a video-over-IP environment. The DYVI switcher platform is fully based on IT equipment and uses IP between the different elements of the platform.

SPEEDING TOWARD REMOTE PRODUCTION

IP-based live production paves the road to remote production. Reliably exchanging all AV and control data between the venue and the production center is the most crucial problem in remote production. IP-based live production, like that enabled by the DYVI platform and the XiP gateway, allow an important number of optimizations. Video over IP enables the optimization of bandwidth by only sending what's really needed. IP data connections allow the multiplexing of multiple flows over the same wire, leading not only to better use of available bandwidth, but also to fine-grained optimization of video transfers.

The video-over IP approach, when designed properly, is scalable for a local set up, a distributed campus network, or a fully remote production, enabling customers to re-use the same equipment and techniques for multiple concurrent productions. In contrast to more traditional approaches, IP enables the sharing of existing infrastructures between multiple broadcast productions, different concurrent workflows, and regular data traffic flow – resulting in much more economically advantageous workflows.

THE STEPS AHEAD

Even with the plethora of equipment and options available today, there's still a lot of work to do before we have a readily available end-to-end solution that's fully tested and interoperable between a wide range of suppliers. The good news is that the pieces of the puzzle are known. Industry-wide initiatives and alignments are needed to fully finish it. Leveraging our extensive know-how of the live production market, EVS is actively participating in these efforts and, together with other major industry players and customers, is developing comprehensive, practical solutions that work together to bring critical benefits to customers and the industry.

As part of this leadership, EVS's *IP4Live* program will ensure the following success factors and strategic directions for the transition to IP:

- > Solutions must be open and interoperable
- > Existing investments must be protected – enabling a gradual migration and hybrid solutions
- > The network fabric supporting the move to IP must be based on professional COTS equipment and an SDN-supported control layer
- > Solutions must allow for a hybrid transition

OPEN AND INTEROPERABLE

Openness and interoperability will be the keys to success of video over IP in live production, as they have been with all the other industries that have adopted it. In contrast to proprietary solutions, standardization ensures the scaling advantage that the IT community brings, in terms of both economies of scale and the engineering workforce that can be mobilized to optimize and harden the solutions. Standardization empowers the customer to select the suppliers of their choice and combine best-of-breed components into an optimized, end-to-end solution. EVS pays a lot of attention to interoperability. For example, EVS' XiP gateway is interoperable with Grass Valley, Imagine Communications, Nevion, and other industry leaders. And we've shown that video over IP, and the network control it requires, works perfectly with off-the-shelf networking equipment from both Cisco and Arista.



PROTECTING EXISTING INVESTMENTS THROUGH HYBRID SOLUTIONS

The introduction of video over IP won't be a big bang but a measured migration. The broadcast industry needs hybrid solutions that protect current investments, while gradually moving to an all-IP setup. XiP is doing exactly that:



customers can continue to leverage their existing SDI-based equipment such as XT3 servers together with video-over-IP-based production equipment, without the need to replace existing SDI-based equipment. Other hybrid approaches include convertors for serial connections such as RS422 and USB over IP links. An important aspect of hybrid systems is to ensure synchronization between the IP and SDI domains, for which several options exist depending on the on-premise environment.

PROFESSIONAL COTS

Size matters. The strength of the IP/IT community comes from a huge number of applications using the same hardware platform (in contrast to bespoke application-specific and proprietary vendor approaches). If video over IP is to become a success, the broadcast industry needs to tap into the larger IP/IT equipment ecosystem and use COTS communications equipment. As a customer, you shouldn't be forced into IP before you're ready, and you shouldn't have to buy a proprietary IP core router.



USER EASE



Throughout the *IP4Live* program EVS keeps in mind the human factor. There are two elements to this. First, ease of use is crucial to successfully adopting new technologies. We must ensure that operator-facing workflows remain the same. For example, we showcased a prototype network controller at NAB and IBC that provides a familiar interface for broadcast engineers, allows easy mapping of video streams to ports, and ensures the necessary translations to the network infrastructure. Second, as with every fundamental change, we must ensure that the people who make it all happen are up to the challenge that new technologies bring. Mindsets as well as skillsets need to change. Broadcast engineers must be trained to be more IT savvy. Likewise, IT professionals need to learn the realities of broadcasting and production. These two different worlds cannot remain isolated. As an industry, we must work to align our technical staff to achieve a smoother transition.

IP PRODUCT DESIGN

Today we're primarily seeing the replacement of SDI and other wires by IP network fabrics. This "IP routed" approach is a first step, but clearly **the live production facility will continue to evolve to a truly "all-IP" live production**, taking advantage of the intrinsic power and benefits of IP in the core design of new products. At EVS, we're harnessing this power, developing new paradigms for live programming, and empowering content creators and production workflows. Using IP at the core of new products, including DYVI, C-Cast SaaS, and future solutions, we're showing how IP can fundamentally change the way you approach old industry problems and help you race toward the new business models and production workflows that promise more efficiency, CAPEX and OPEX savings, and new monetization opportunities.



COMPRESSION SCHEMES

With IP, limited bandwidth or simply the need to get more out of network infrastructure will require compression. To support live production, it's essential that codecs are visually lossless and very low latency to mirror the quality and low latency of uncompressed video. TICO, Sony LLVC and VC-2 LD (Dirac Pro) all meet these requirements. Yet the more codecs that exist, the more challenging interoperability becomes and more difficult for customers to combine best-of-breed components. All codecs, including the higher bitrate J2K and AVC-I schemes necessary to carry multiple signals over a single 1Gbps wire, must be open and available to all in the industry.



Like remote production, virtualization in private or public cloud infrastructures is continuing to gain in importance and application, driven by the desire to further tap into the vibrant IP/IT ecosystem and benefit from the advantages offered by datacenter operations. EVS's *IP4Live* program is closely following and preparing for this evolution.

Video over IP as a core infrastructure for live production is still in its infancy. To help the industry mature, we need proven **reference designs**. EVS and its partners are actively working on a range of reference designs that are proving the range and benefits of IP in the live environment.

REAL-WORLD APPLICATIONS

Together with Cisco, EVS demonstrated a successful remote production using SDN, COTS switches and a low-latency routed approach. The multi-feed live production – via SMPTE 2022 uncompressed video – over an IP network using Cisco’s standard IP switches, SDN and EVS’ new XiP gateway that enables in/out IP links to its live video server illustrated how reliable, low-latency high-quality video flow between remote sites can be achieved. Moreover, the configuration ensured the necessary bandwidth for production-critical video flows while dynamically allocating all remaining bandwidth to best-effort traffic such as file transfers.

This set up follows a hybrid approach, mixing SDI- and IP-based equipment and allowing optimal use of existing investments. The system also illustrates that operators’ workflows don’t change. For example, an LSM operator can’t detect the difference between an SDI-routed set up and this IP-based network.

EVS is also part of the VRT/EBU LiveIP initiative, a multi-vendor system integration project that showcases IP-based live broadcast production. EBU, VRT, EVS and others worked collaboratively to create a live TV production studio at VRT’s Brussels-based headquarters. The studio uses open standards –SMPTE 2022/6, AES67, and PTP – to transport broadcast feeds via SDN, enabling quick, efficient and cost-effective program development.

The studio clearly shows what’s possible today: high interoperability between multiple vendors, seamless switching and limited redundancy of uncompressed video and audio feeds as they’re transported over an IP network. Openness and standardization are key to this integration, requiring a system based entirely on existing standards, with no proprietary solutions.

The innovation is sure to continue. Welcome to *IP4Live*.

For more information, go to <http://www.evs.com/ip4live>