

Contribution networks

IP contribution has become a highly attractive and bulletproof option for broadcasters, and any other industries that rely on professional grade media transport. For live content production, one of the biggest growth areas has been the use of IP as a standard way to transport high-quality content in real-time between locations. While IP contribution gives enormous flexibility and breaks down barriers both in terms of cost, and where functions are implemented, NeviON provides the required products, solutions and services to overcome some of the potential issues associated with IP.

IP networks are more flexible and cost-effective than networks built with traditional technologies. The ability to run all types of services on a single network, whether it is audio, video, control data or configuration of web interfaces, means there are fewer network technologies to manage. The fact that IP packets travel easily across multiple different locations means the barriers to remote production or distributed processing are torn down. For outside broadcast, IP enables virtualization of functions independent of location, making the remote location and the media facility a virtual studio. Production crews and equipment can work more effectively and cover more events, leading to a substantial reduction in the cost of the event. One NeviON customer stated that IP contribution and production saves them on average 12,000-15,000 USD per event—multiply that by 500+ live sports events covered each year and the financial benefits are an obvious attraction!

While IP networks are now a commodity, there are a few things to be aware of when moving from a legacy ASI, ATM, SDH/SONET or dark fiber media infrastructure into IP/Ethernet multi-service media networks. In order to provide similar predictable performance and high level of QoS, IP/Ethernet networks must be carefully designed and managed, either manually by networking experts or via software defined networking (see separate solution paper on this).

What is also crucial to consider, is that fault resilience and redundancy is implemented differently in IP networks. Forward error correction is used on satellite and radio links to protect against bit errors, and can be used on IP to protect against occasional packet loss, and even burst packet loss. With the introduction of IP there are also new solutions that exceed what broadcasters are used to, such as Seamless IP Protection Switching (SIPS), where a service is being transmitted over dual redundant networks links, and there is absolutely zero negative impact on the service if the main network link is lost.

NeviON offers state-of-the-art intelligent media endpoints that add additional layers of monitoring, resilience and protection on top of IP—making IP contribution a no-compromise choice for high quality live broadcast productions.

Benefits snapshot



Broadcasters:

- Leverage the flexibility and cost savings of using IP networks
- Transport video, audio and data from a variety of sources and formats over the same IP network, reliably and with low latency
- Squeeze more content over the same bandwidth, using visually/aurally lossless encoding
- Control the network, setting up and taking down occasional-use links on demand, for optimum cost-effectiveness

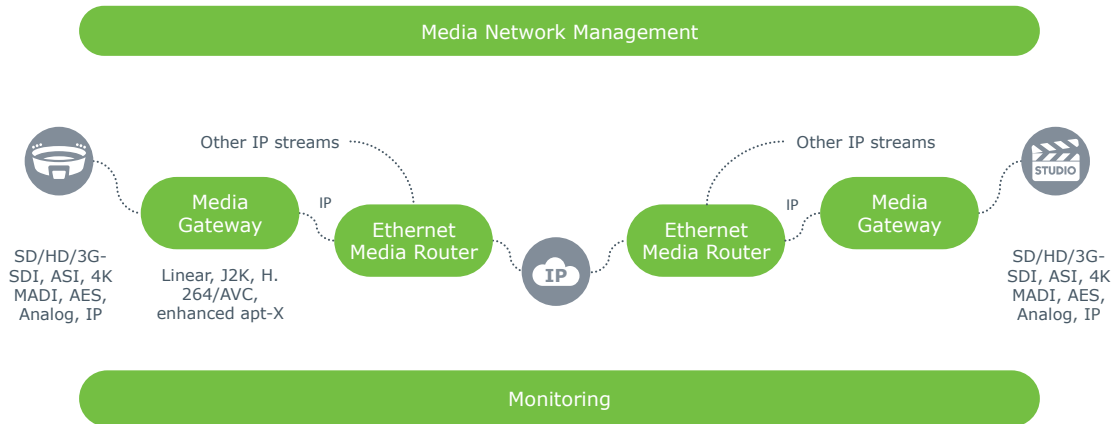
Telecom service providers:

- Offer IP network services for professional quality content contribution
- Monitor compliance to SLAs
- Offer a compelling value proposition by empowering customers to manage their network needs with NeviON's media network management system, VideoIPath

The NeviON offering consists of:

- Video and audio media gateways, to convert signals to and from IP, monitor, process, encode and decode the content as required and aggregate services on a common network link
- Ethernet media routers (optional), to aggregate a large number of IP streams if needed.
- Monitoring, to ensure the integrity of the signals at both ends, and the compliance to Service Level Agreements (SLAs)
- Media network management, to provide an easy-to-use means of managing the contribution network, puts users firmly in control of their own network, in a way that has not been possible until now

IP contribution



Video and audio media gateways

Nevion provides a range of video and audio media gateways that are used by major broadcasters, telecom service providers and other media organizations across the globe. At IBC 2014, Nevion announced a new H.264/AVC media gateway, the NX4600, which adds a level of encoding/decoding flexibility, monitoring and density that is unmatched in the market.

All media gateways are designed to take video and audio signals from a variety of baseband formats (SD-SDI, HD-SDI, 3G-SDI DVB-ASI for video and MADI, and digital AES and analog for audio) and prepare them for transmission over IP/Ethernet networks (and indeed other networks such as SDH/SONET), as well as convert them back to baseband technology at the receiving end.

These gateways can transmit video content in uncompressed (linear) format, or can encode the content with JPEG 2000 or H.264/AVC. The formats are essentially a balance between image quality and latency on the one hand, and bandwidth usage on the other. Uncompressed video transport gives bit-perfect representation and a few millisecond latency, however it uses a significant amount of bandwidth.

JPEG 2000 typically uses just 10% of the uncompressed bandwidth usage, and high image quality (visually lossless), at the expense of less than 4 fields/frames of latency. H.264/AVC gives the most bandwidth saving (close to 1% of the uncompressed usage), with typical HD contribution at 15-30 Mbit/s—at the expense of a few hundred milliseconds latency. Analog or digital audio can be transported without compression, or with enhanced apt-X compression (which uses 25% of original bandwidth), with only a very few milliseconds of latency.

With their support for equipment redundancy, path redundancy—including Seamless IP Protection Switching (SIPS) and forward error correction (FEC), the adapters ensure that content is transported reliably across the network, and that equipment or network failures do not affect the signal.

Ethernet media routers

As part of Nevion's VikinX product line of broadcast audio and video routers, VikinX eMerge is a series of next-generation Ethernet media routers, specifically designed to aggregate, switch and forward IP media streams in a broadcast environment. These routers can be used as an option where many IP media streams—for example, those resulting from multiple video and audio media edge adapters—need to be aggregated together.

Monitoring

Nevion's nSure product line includes a comprehensive range of in-service monitoring solutions for media transport. With full monitoring of integrity, presence and activity on each channel, these solutions allow users to pinpoint quality of service issues along the transport path and correct problems before they affect services—a complete solution for monitoring the entire video transport infrastructure.

The solutions can be used to monitor compliance to Service Level Agreements (SLAs) between broadcasters and providers of the IP contribution service, by providing the means to check the integrity of the baseband signal given to the service provider for transporting and the signal delivered by the service provider.

Media network management

Nevion's VideoPath is the key component of any IP contribution network. Designed to make it easy to manage traditional and IP-based media networks, it hides the underlying complexity, enabling users to achieve their objectives (such as setting up a connection in a remote location) in a quick and simple way.

VideoPath is software that allows:

- The creation of connections (services fulfilment) for wide area, metro or in-campus networks—scheduled, or on the fly for occasional use
- The recording (inventory) of all network and endpoint resources
- The monitoring of network resources and correlation with ongoing services (service assurance)

VideoPath effectively enables broadcasters to leverage the strengths of IP (and legacy) networks, without needing expert know-how. For example, instead of handling specific cards and ports, users deal with named sites and required service functionality—by merely selecting an appropriate pre-defined profile for the connection.

Nevion services

Nevion works with its customers and partners, drawing on its vast experience of broadcasting and telecoms, and specialist expertise in IP technology, to produce the right system design, get the solution into operation and provide support during and after the deployment.