Nevion and the remote production revolution

Application Note

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Nevion
Email: sales@nevion.com
www.nevion.com

Nevion Europe (HQ)

P.O. Box 1020
3204 Sandefjord, Norway
sales@nevion.com
+47 33 48 99 99

Nevion USA

1600 Emerson Avenue
Oxnard, CA 93033, USA
ussales@nevion.com
+1 (805) 247-8560

Nevion APAC

3 Science Park Dr., #02-05
The Franklin, Singapore 118223
asiasales@nevion.com
+65 6872 9361

Nevion MEA

P.O. Box 502199, Dubai UAE
middle-east@nevion.com
+971 (0) 4 390 1018

Revision History

Rev.	Repl.	Date	Sign	Change description
1	-	10-Oct-2014	OS	Initial revision
2		28-Oct-2014	OS	Further revision

Contents

1 Introduction

1.1 Broadcasters need to do more for less

We live in a world where, potentially, everyone is a broadcaster, e.g. enterprise TV, bank and stock-markets, religious channels, newspapers/media-houses, web-TV, etc.

For "traditional" broadcasters, success depends on creating and delivering more quality content. And nothing is more compelling than live-TV. For broadcasters, live content is extremely valuable, with its unique capacity to draw in viewers, and therefore advertisers. However, given the competition from low-cost "broadcasters", this live-content needs to be produced extremely cost efficiently nowadays.

In other words, broadcasters are being asked to create more content, at least cost.

1.2 Live production challenge

Productions involving remote locations create a lot of challenges for broadcasters.

1.2.1 Cost

For broadcasters, production outside the controlled environment of the studio is expensive, because of the equipment and the staff that need to be at the remote location. This is compounded by the fact that the communication links between the remote location and the central facilities can be prohibitive, e.g. satellite link, especially when not booked well ahead of time.

1.2.2 Complex logistics

The logistics of setting-up a production in a remote location are often extremely complex, involving shipping fragile and costly equipment, sending skilled staff, and complicated set-ups.

1.2.3 Inefficiencies

Equipment and staff at a remote location can only been used for events at that location, which in many cases are few and far between (indeed often a one-off event). This means that resources are largely under-used for the period where they are deployed at the location.

1.2.4 Inflexibility

The complexity, the cost and the demands on resources (human and technical) of the covering live events means that there are inherent logistical and commercial limitations as to what events and how many can be covered. This

inflexibility is a burden on broadcasters at a time when then need to create more live content to remain competitive.

1.2.5 Quality

Quality is a watchword for broadcasters, and the coverage of live events needs to be of the highest quality. The reality is that it is simply impossible for broadcasters to deploy remotely the same technological and professional resources that are available in a central location, without effectively creating a full studio. So for anything but the top end productions, remote production has an impact of quality.

1.3 Revolutionizing the live production workflow

Given the complexity and the cost of live remote production, there is a strong drive from broadcasters to simplify the remote set-up, and centralizing as much of the production as is possible – even for live-events. The fewer people and pieces of equipment need to be sent to a remote locations, the easier and cheaper it becomes to set-up and produce a remote live event. Furthermore, the more can be produced centrally, the more efficient the production becomes, as skilled production staff and valuable equipment can be assigned to multiple productions more quickly.

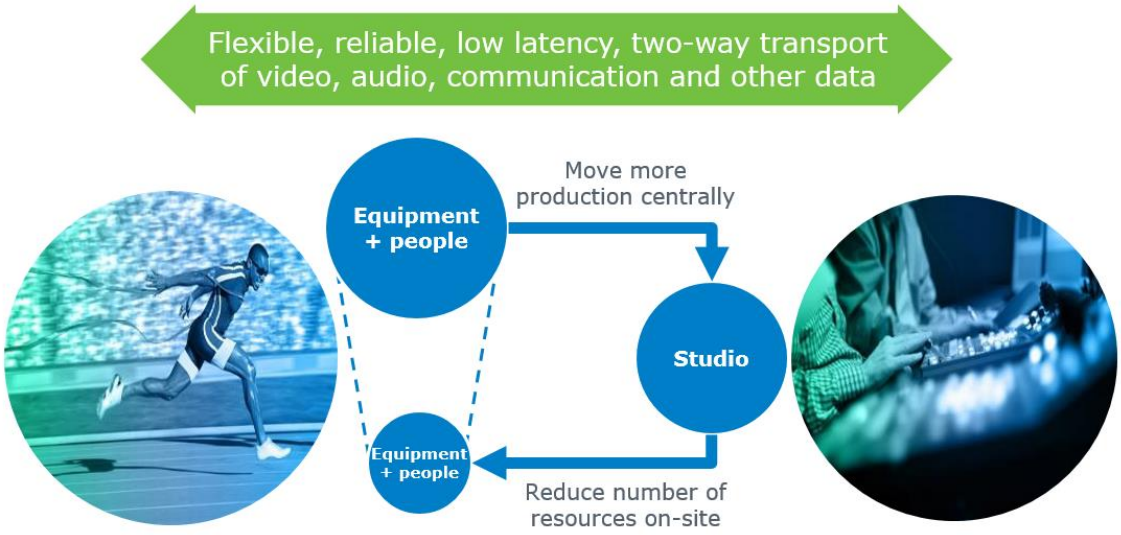


Figure 1: Transforming the Workflow

1.4 Impact on signal transport

In order to revolutionize production workflow in this way, it is essential to have extremely flexible, reliable, low latency, two-way transport of video, audio, communication and other data, between the remote location and the central production facility. This is precisely what Nevion enables.

2 Nevion's offering for remote production

2.1 Overview

Nevion offers a complete suite of products that make it possible to carry the productions signals securely and with a low latency over considerable distances. These signals can be transported over optical networks transparently on dark fiber, or over IP either in uncompressed, linear form or compressed using the low-latency JPEG 2000 codec.

Nevion's equipment is compact so it can also be carried easily to the location where it is required and can also fit in virtually any environment where space is at a premium. Nevion also provides the management systems that make it easy to set-up, monitor and manage occasional use links, such as those required for remote production.

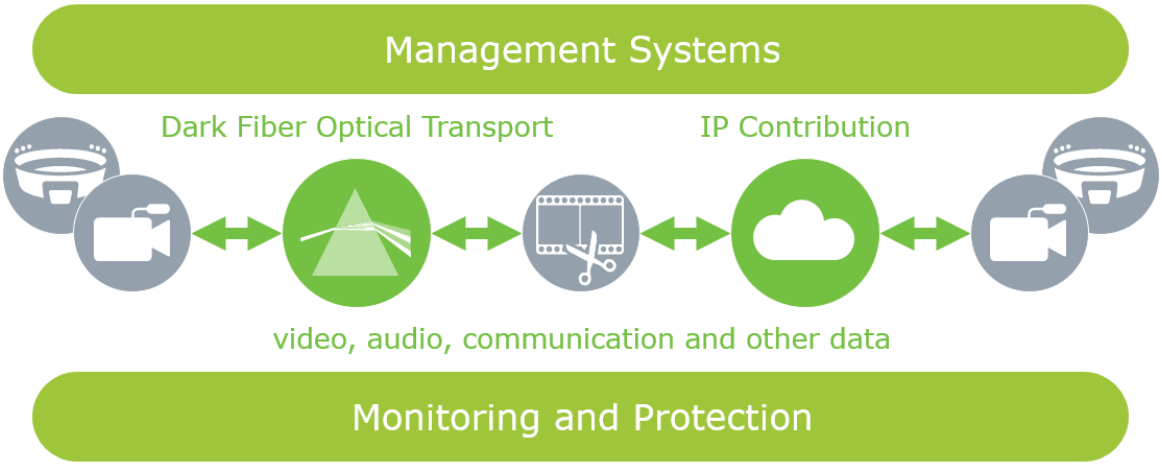


Figure 2: Nevion's Remote Production Offering

2.2 Dark fiber optical transport

Nevion provides the multiplexers, signal processors and compact routers that are needed to transport all the signals required for the production of live-content, reliably and with close to zero-latency over an optical network.

These solutions enable extremely high fiber utilization, capable of up to 240 HD-SDI signals combined with thousands of audio channels on a single fiber, as well as redundancies and control, and in-band or web management.

These solutions also support the often overlooked intercom, which actually has as much importance in remote productions as the video and audio (no comms – no TV). To address this, Nevion offer a variety of interfaces to Intercom systems, Ethernet IP, AES or analogue 4-wire.

In the context of remote production, fast set-up and easy control are essential. Nevion's Multicon is a panel- and web-based integrated control system to manage some of the key elements in the optical transport chain. Features include the ability to storing set-ups, and recall them on demand, for rapid configuration.

For more information, contact Nevion about its Production Network and Broadcast Infrastructure solutions.

2.3 IP contribution

As IP networks are both ubiquitous and cost-effective, they offer an excellent option to transport remote production signals from the location to the central facility over distances beyond the reach of dark fiber networks.

Nevion offers the state-of-the-art equipment that makes IP-based networks work for the real-time contribution of broadcast-quality content. This equipment is the result of substantial investment in IP-related R&D over a number of years. It has been widely deployed across the globe to create reliable IP contribution networks.

At the core of the solution are Nevion's media gateways, that 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 transport them securely and with low latency over IP/Ethernet networks. The video signals can be transported in uncompressed form, or be compressed using JPEG 2000 to save bandwidth.

More information can be found in Nevion's IP Contribution Solution application note.

2.4 Monitoring

Nevion provides a variety of monitoring probes that allow broadcasters to check the signals along the transport chain, whether optical or IP. These monitoring devices play a particularly important role when, as is often the case these days, the network links are outsourced by the broadcaster to service providers and Quality of Service (QoS) needs to be ensure and Service Level Agreements (SLAs) complied to..

When planning remote production, it is important to know in advance whether the connection to the location is up and running (i.e. available resource), even if the edge equipment is not yet connected. These checks can be performed in many ways with IP technology, but a monitoring device will provided enhanced information about QoS and SLA parameters.

2.5 Media network management

From remote production, the ability to manage connections to sites and in particular schedule connections is an important requirement. Nevion provides a management tool, VideoIPath, that enables virtual resource planning, inventory management, self-provisioning of connections by broadcasters (including pre-booking network resources for scheduled events) and monitoring – all this in the same tool!

VideoIPath has been designed to make it easy to set-up occasional-use connections, such as those needed for remote production. The software allows non-expert users to manage both optical and IP networks, though and easy-to-use and versatile web-GUI. The connections can be set-up either in a scheduled manner or for immediate use. Aside from enabling remote production virtually on demand, this dynamic approach to establishing connection ensures that broadcasters use only as much network bandwidth as they need.

VideoIPath can also act as the central console for monitoring the information provided by equipment and probes in the network.

2.6 Any type of remote production

Nevion's solutions are appropriate for any type of remote production, from high-end major events (e.g. Olympics, top-tier football) involving many cameras and staff, to ad-hoc productions (e.g. vox-pop or even minority sports) with one on two staff on site, some fixed cameras.

At the high end, dark fiber and IP can be used, and the signals be transported either in uncompressed (or linear) form or with low latency codec such as J2K. H.264/AVC compression can also be used for some signals where bandwidth is limited and slightly higher latency is acceptable.

At the low end, IP and higher level compression is likely to be used, because of the ubiquity of IP but also the relatively low bandwidth typically available at some locations.

Table 1: Type of Remote Productions

Type of production	Focus	Expectations	Typical Transport Options
High-end production e.g. major event	Quality	• Very high quality signals • Extremely low latency	• Dark fiber or IP • Uncompressed or JPEG 2000
Intermediate level production	Balance between quality and cost	• High quality signals • Low latency • Reasonable production costs	• Dark fiber or IP • Uncompressed, JPEG 2000 or H.264/AVC
Low-end production e.g. any location, any time	Flexibility and cost	• Reasonable quality • Some latency acceptable • Low production cost	• IP • JPEG 2000 or H.264/AVC

3 Features

3.1 Compact

All the equipment provided by Nevion is compact and robust, meaning it can be used for virtually any remote set-up.

3.2 Any network

Nevion can transport the signals between the remote locations and the central facility over optical dark fiber and/or IP networks, providing a great deal of flexibility for broadcasters.

3.3 Low latency

All of Nevion's solutions are extremely low latency, making the remote production of live events are reality.

3.4 Secure and reliable transport

Nevion's equipment provides a number of features that enable the secure and reliable transport of signals, even on a "best effort" IP network. These features include 1+1 equipment redundancy, dual paths and special algorithms for errors corrections (IP networks).

3.5 Easy management

Nevion has invested a lot of research and development effort into making the management of the media networks as simple of possible, in order to empower broadcasters to be self-sufficient as much as possible. This self-sufficiency translates into greater nimbleness and substantial cost savings.

4 Benefits

This new approach to remote production workflow creates benefits in terms of cost savings, increased flexibility and revenue potential.

4.1 Cost savings

Less, more lightweight and comparatively cheaper equipment is required on site and fewer people needed to be sent to remote locations. This represents a substantial cost saving for broadcasters. For example, one European broadcaster dramatically reduced the number of people it sent to cover the Olympics, from 200 for Beijing 2008 to just 40 for London 2012.

4.2 New revenue opportunities

The fact that fewer people and pieces of equipment are required, and that links can be set up almost anytime, anywhere cost-effectively (especially using IP), means that more remote productions are not only possible logistically but also viable economically. This opens new revenue opportunities for broadcasters, for example by covering sports or other events that have more of a niche market appeal.

4.3 More compelling content for viewers and advertisers

Better links mean that more clean-feeds can be transported back to the central location, resulting in better production. It also makes it possible for broadcasters covering global events, such as the Olympics, to add a more regionally relevant touch to the broadcast thereby differentiating further their broadcast and making it more compelling for viewers and advertisers.

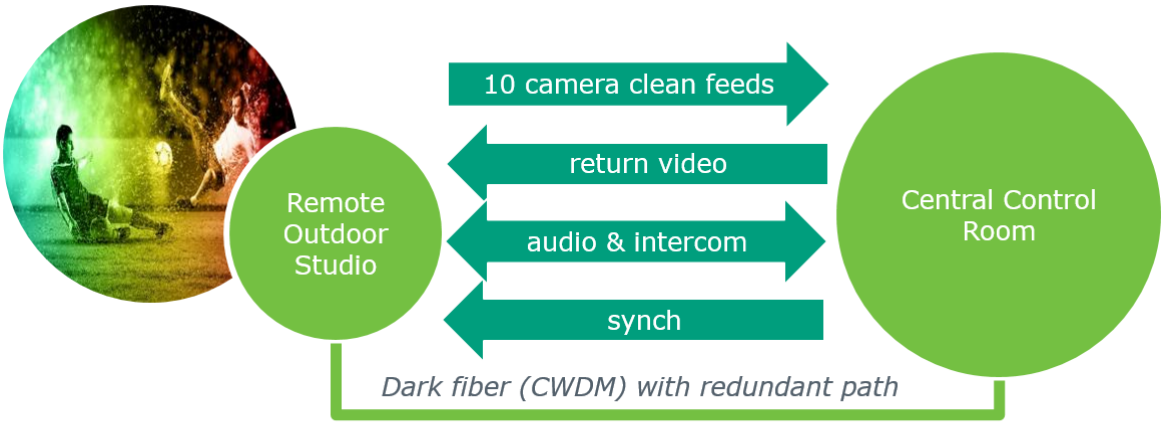
Appendix A Case Study

A.1 VRT

The Vlaamse Radio- en Televisieomroeporganisatie (Flemish Radio and Television Broadcasting Organization), or VRT, is the national public-service broadcaster for the Flemish Region and Community of Belgium. It offers 4 channels (2 in HD), which are broadcast over cable, satellite, DTT and IPTV.

The project involved the interconnection of the TV control room (tech. area inside VRT TV building) with the "Dome", a temporary outdoor surface in Belgium used as TV-set during the 2014 FIFA world-cup in Brazil. The Dome was used for a live daily sports/football entertainment program (with live audience) before, in between and after Worldcup'14 games.

The solution was put together and delivered by Nevion partner Network Belgium. The set-up used dark fiber (CWDM) with redundant paths, to carry 10 camera clean feeds, return video, audio and intercom, Ethernet and Sync, Studio Monitors (analogue) to/from the remote studio. The deployment involved tried and trusted equipment from Nevion's Flashlink family.



Project with Nevion partner: **Network Belgium**

Figure 3: VRT Case Study

The benefits realized by VRT include:

- Lower costs, as there was no OB and few cables needing to be pulled (man-power savings)
- The set-up was faster, as it was simpler

- The resulting production environment was much better, especially for the production staff who did not need to be crammed into an OB van!

For more details about this project and the equipment used, please contact Nevion.

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