

The IP Broadcast Revolution

The evolution from baseband to IP turned into a revolution in 2020, as the effects of the COVID-19 pandemic forced the streaming and broadcast industries to double down on remote production workflows and technologies. With studios shuttered, broadcast operations centers empty, and OBS trucks parked, video technology companies and producers have turned to IP-based production like never before, embracing its efficiency, flexibility, and ability to cost-effectively meet rapidly changing requirements.

What were once esoteric requests have become table stakes. Not only do video producers and platforms need to be able to ingest non-baseband sources, but they need to be able to use the entire gamut of IP-based protocols, and sometimes several of them during the same production. Likewise, they need fast, frictionless ways to transcode those feeds and files into multiple house formats for asset management and distribution. A massive shift to IP is underway, and with it a move away from bulky, expensive hardware to more flexible software and cloud-based solutions as well as more lightweight field gear like bonded cellular backpacks.

Indeed, the pandemic has forced the entire video industry—both traditional broadcast and streaming—to speed up its adoption of IP exponentially. “I think that the pandemic accelerated adoption by 5 years,” says Primestream CEO Claudio Lisman. “It forced and all of a sudden we had to shift our paradigm.”

The new normal is here, and there’s no going back. In this white paper, we’ll look at the shift to IP and the cloud, and how Primestream’s IP Broadcast Network Operation Center™ is enabling the future of video workflows.

From RF and Baseband to IP

Legacy broadcast systems using SDI (serial digital interface) require dedicated routing switchers, video monitors, and ingest hardware. While they offer reliability and high quality, they are inflexible and limited in terms of the number of inputs and outputs that can be achieved without adding additional hardware routing switchers. Adding additional output formats for edit, media asset management, and playout is equally cumbersome (see Figure 1), without adding additional hardware routing switchers. Adding additional output formats for edit, media asset management, and playout is equally cumbersome (See **Figure 1**).

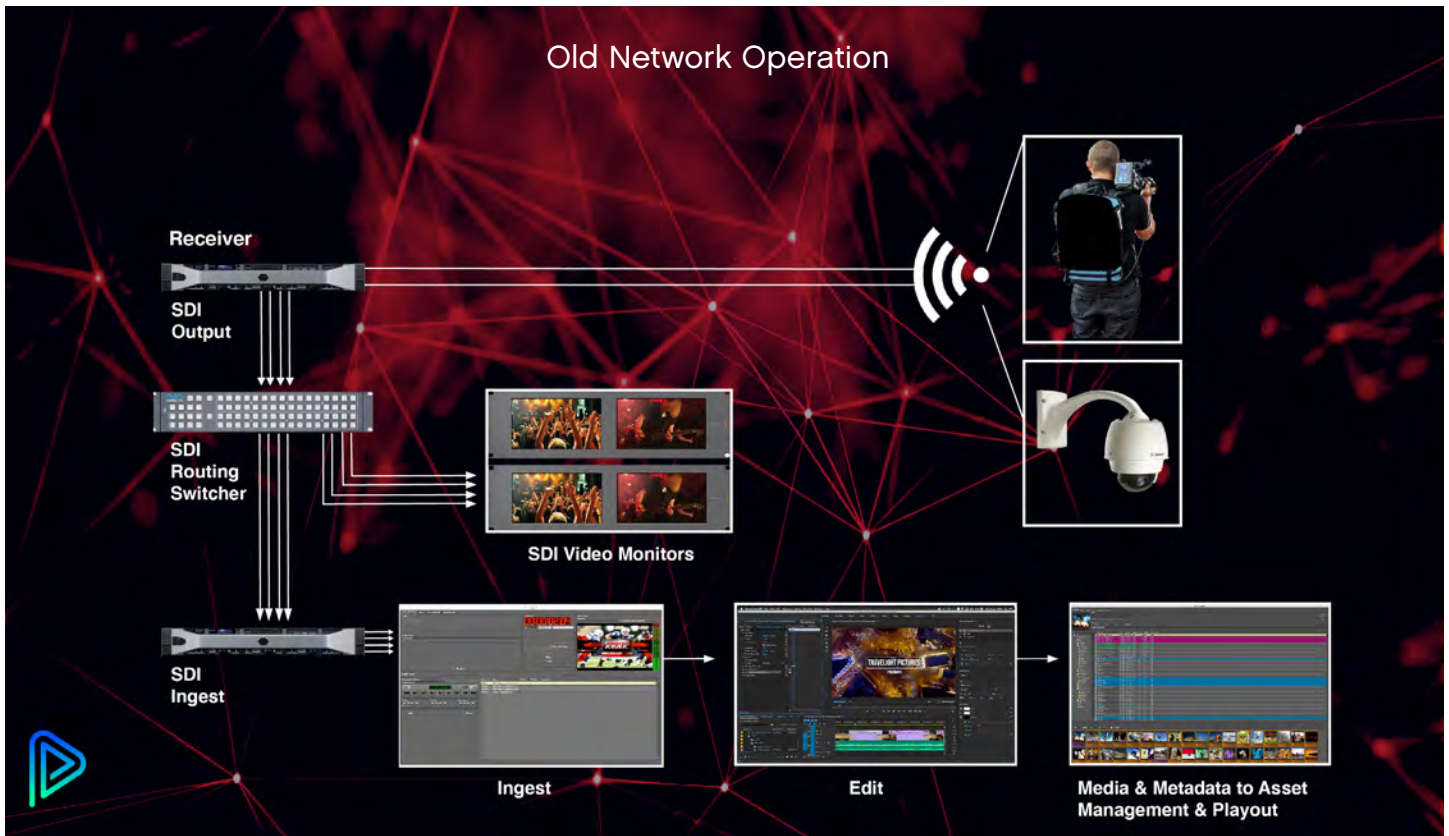


Figure 1. An SDI-based workflow

IP-based systems offer the ability to acquire signals from a virtually unlimited number of inputs using a wide range of protocols (SRT, WebRTC, HLS, RTSP, etc.), then output via an ethernet switch for live multicamera monitoring, real-time transcoding to house formats, live editing, and finally publication, distribution, and/or re-transmission (See **Figure 2**).

Think of it this way: The receiver or tuner has been replaced by a web browser, and instead of tuning to an antenna, you point that browser to a URL or IP port. And the hardware recorder has been replaced by software that allows you to not only record, but also to view and start converting in real time to an editable format.

“Now, you can have a huge number of inputs coming in on IP,” Lisman says. “You can switch them, and you can record them in real time in the format you want. If you get an HLS stream and want to convert it to SRT, you can do that. If you get an SRT source and want to convert it to XDCAM, you can do that. And you can provide a streaming as growing file to an editor that is

anywhere in the world, and he can start working on editing that piece and send it to multiple devices via web distribution or send a signal to a satellite or television transmitter.”

Indeed, with IP, the possibilities are almost limitless. And, as we’ll see later, broadcasters don’t need to drop SDI entirely—IP streaming, NDI and SDI can coexist in the same workflow.

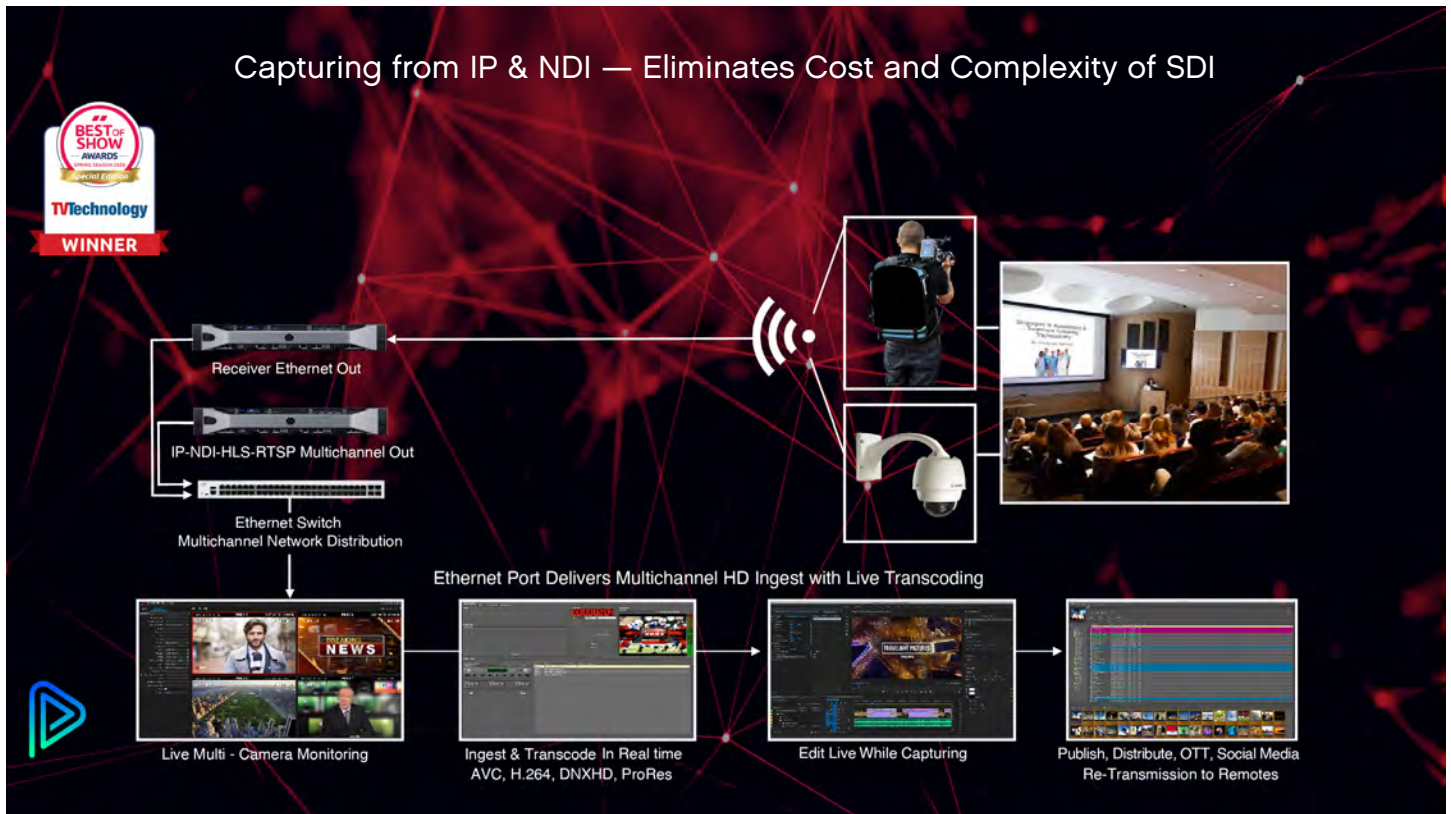


Figure 2. An IP-based workflow and Network Operations Center

From Antennas to SIM Cards

It used to be that even a simple broadcast—let’s say a remote news interview—required outside broadcast trucks, large antennas, and all manner of logistical and technical wrangling just to get the signal back to the broadcast operation center. “The first large aperture antenna I installed in the late 80s was a 36-footer,” Lisman says. “And if you wanted to cover an event, you had to take a seven-meter antenna on a truck and see if you can pass through the streets, find your parking spot, and make sure you had clear line of sight—all those logistics to just transport a signal from point A to point B. We also used to use a lot of microwave devices where you had to align your antennas, make sure there was enough power, and make sure there was no interference or obstacles between your transmission and receiving sites. You had to go through a whole process, just to be able to do an interview to one person coming out of a building. Well, that paradigm’s changed.”

Today, bonded cellular transmission radically simplifies remote production and live contribution, replacing those unwieldy antennas and expensive uplink trucks with devices small enough to hold in your hand or, at most, wear in a backpack.

Camera operators and producers can bond together 101 Mbps upstream SIM cards to achieve 10Mbps of throughput, which is more than enough to deliver an HD stream and replace the need for a satellite uplink.

And bonded cellular isn't the only technology that's replacing bulky broadcast cameras. Drones, in-vehicle cameras, and PTZ cameras are now capable of sending high-quality (HD or higher) video signals from anywhere in the world to anywhere in the world—all via IP.

"I've seen the transformation from what I call the RF tuner, the tuner that you have to use to communicate over satellite, to the IP tuner," says Lisman. "What is an IP tuner? Any URL is now a tuner. We're tuning into a channel in a different fashion, but we're still tuning."

From the BOC to the Cloud

With portable technologies, IP-based signal acquisition, and cloud-based tools, broadcast and streaming production teams are now able to work entirely remotely. What's more, they have access to more capabilities than ever before. Primestream is enabling all of this with Media I/O and Xchange Media Cloud™ (XMC), which together make it easy for teams to assemble an IP Network Operation Center, either in a central location or distributed locations (See Figure 3). The traditional broadcast operations center will always have its place, but as the "new normal" become simply "normal," broadcasters now have an alternative to the status quo.



Figure 3. With Primestream's Media I/O and Xchange Media Cloud, broadcasters can assemble an entire IP operation center with off-the-shelf hardware and acquire signals from all manner of IP sources.

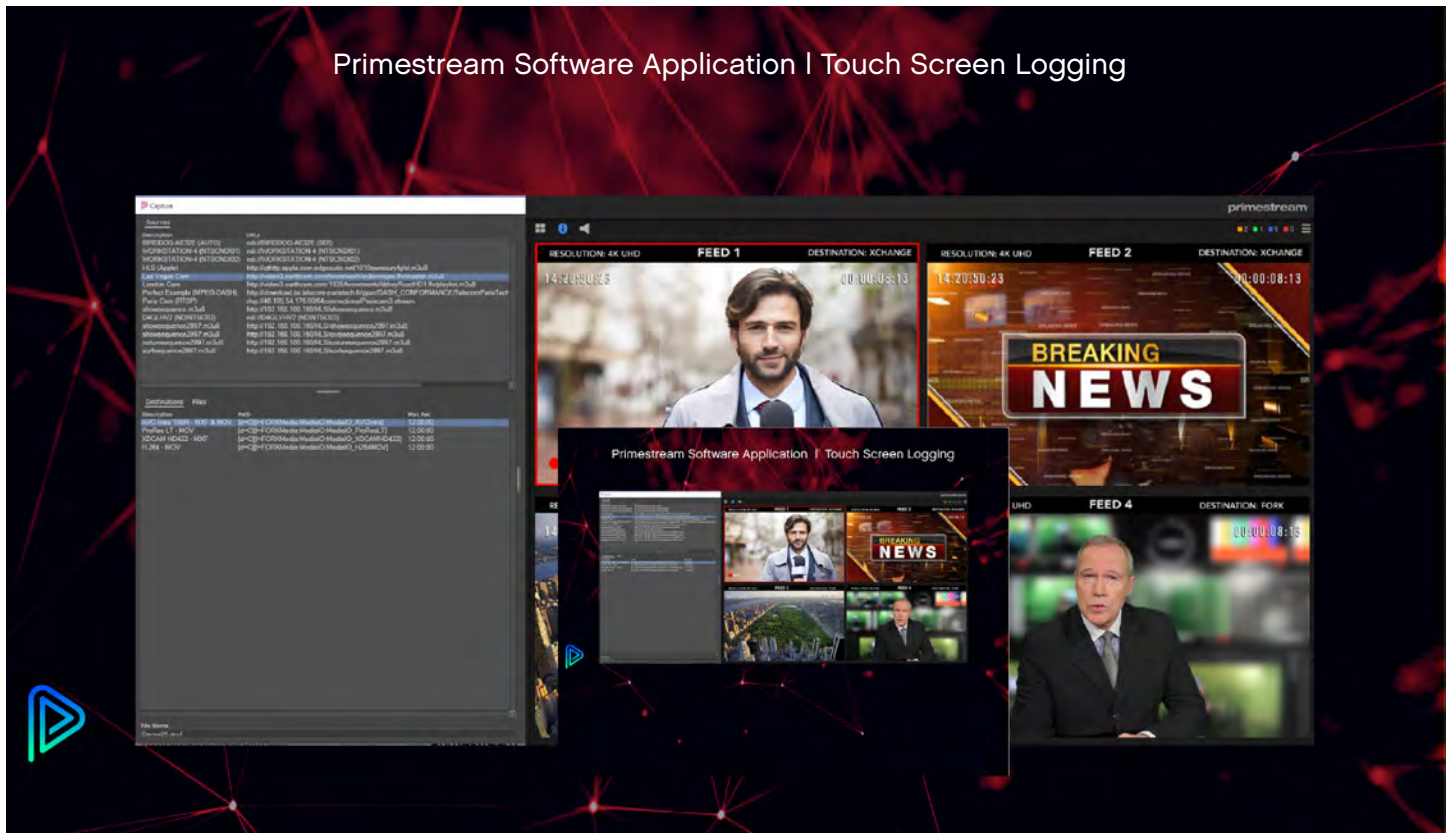


Figure 4. Primestream Media I/O captures multiple feeds from a variety of sources.

Media I/O™

Primestream's Media I/O is an advanced solution for video production and distribution that enables capture video content from practically any source, then transcode it live for integration into a production, management, and delivery workflow. It can capture content from any IP stream, camera, or broadcast source including SRT, NDI, HLS, RTSP, DASH, and even SDI, taking incoming feeds from both baseband and non-baseband sources and transcoding them into ProRes, XDCAM, AVC-Intra, DVCPRO, H.264, and H.265/HEVC all in real time. The Media IO™ application It's capable of working with both HD and 4K UHD signals.

Compatible with both Windows and Mac OS, Media I/O is a software-only solution that manages all streams in real time without costly hardware decoders. It also enables real-time editing in Apple Final Cut Pro X™ and Adobe Premiere Pro™, and editors can preview and edit live streams in those NLEs while the

video feed is still being captured (See **Figure 4**). What's more, with Media I/O's touchscreen logger, a producer can monitor all IP sources and easily create subclips with metadata, then transcode to output formats for pushing to OTT and social media (See **Figure 5**).



Figure 5. Media I/O allows editors to easily create metadata and subclips during live events such as soccer games, then transcode and push those clips to OTT or social media platforms.

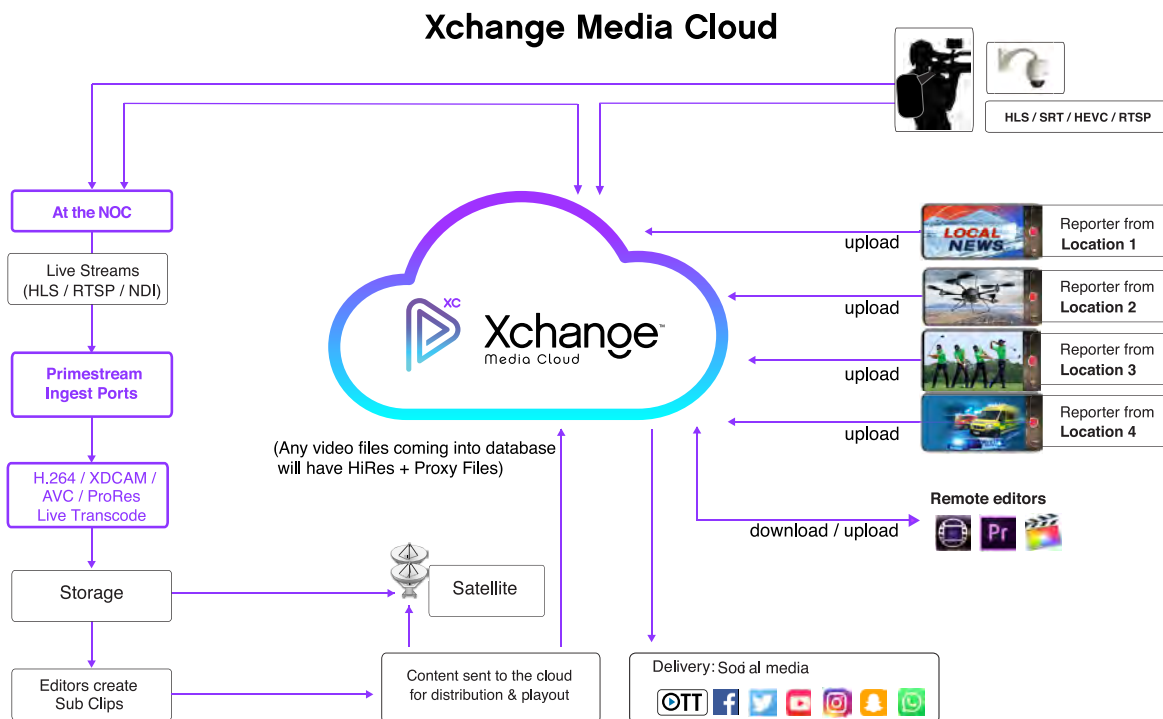
Xchange Media Cloud™

Primestream's Xchange media asset management (MAM) platform has long been the industry gold standard. Xchange Media Cloud brings all of the power and functionality of Xchange to the cloud, making it easier than ever for geographically dispersed teams to store, access, produce, and manage all of their media assets as well as collaborate on projects from anywhere in the world.

Because Xchange Media Cloud is integrated with Adobe Creative Cloud (including Premiere, After Effects, and Photoshop)—as well as Apple Final Cut ProX and DaVinci Resolve—video, sound, graphics, and effects teams can work on any streams or files from Media I/O, no matter where they are. Production teams can work with both baseband and SDI sources as well as IP files and streams, so Xchange Media Cloud can work alongside existing Xchange installations or can be launched independently from Xchange. In either scenario, it can be up and running quickly as either a temporary replacement for or supplement to an on-prem installation or as a long-term hybrid solution for the future.

From Today to Tomorrow

The paradigm shift from broadcast operations centers and satellite trucks to IP-based network operations centers and smaller and more nimble transmission gear, cameras, and capture devices was well underway before 2020, but the unprecedented events of this year have forced production teams to make the leap now. With Primestream's Media I/O and Xchange Media Cloud, broadcasters and streaming organizations can respond to the immediate demands of today while positioning themselves perfectly for the future.






About Primestream

Primestream is a leading provider of asset management, automation software, and workflow orchestration solutions for media and production operations that are scalable and highly configurable across markets, platforms, and infrastructures to ensure long-term flexibility and value. With a long history in media creation workflows, Primestream combines best-in-class technology with proven reliability to help optimize media creativity for enterprise, digital media, sports, and broadcast operations worldwide. Primestream products leverage deep expertise and insight into market trends and customer requirements to connect content creation, collaboration, asset management, production, and delivery together in an optimal workflow.

The Primestream software suite has been field-proven in a wide range of production facilities for many of the world's leading broadcasters and corporations, such as Vice Media Group, Microsoft Production Studios, Cisco TV, NFL Networks, NFL Films, StreamTeam, AT&T Sports, SunTV, Disney, New World Symphony, Verizon Media Group, Fortune Magazine, Time USA, Business Insider, USC Annenberg School for Communication and Journalism, MTG Sweden, Newsy, and many more.

More information on Primestream solutions:

Primestream.com or on   

Contact us today to schedule a demo!

[Primestream/Contact](#)