



Digital Video Solutions

The IP Evolution of Broadcasting

By Rick Young, Senior Vice President, Head of Global Product, LTN Global

The evolution of broadcast production and the advantages of leveraging cloud technology to transform workflows and overcome issues arising from legacy infrastructures.



Rick Young,
Senior Vice President,
Head of Global Product,
LTN Global

Rick Young is a media technology and services executive with senior leadership experience at news organisations, content owners and

technology providers ranging from start-ups to global brands.

Throughout his career, he has focused on the crossroads of media and technology from both content creation/delivery and consumer experience perspectives.

Despite being a relatively recent phenomenon in broadcasting, smart IP technology is having a profound impact on the industry's workflows and operational processes. Cloud solutions are enabling faster deployment, enriching video acquisition as well as expanding delivery and distribution capabilities for media companies. Machine Learning is also playing a large part in how broadcasters curate content and streamline monetisation.

As traditional broadcasters adapt to the digital era, the transition to IP infrastructure is providing the right frameworks to not only overcome the legacy challenges facing the media industry today but also to deal with the challenges of the future.

Agile live production

Configuring the hardware for live production is often a time-consuming and labour-intensive process. Even a small-scale production, such as a live news report from a remote location, can often require setting up satellite newsgathering vehicles that can be quite expensive and anything but instant. We will see growth in field IP transmissions as more broadcasters continue to transition to IP workflows that are

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enabling faster live production, with de-centralised and agile teams.

When combined with a fully managed service offering and critical technology to work around inevitable and frequent internet choke points, it becomes possible for live video to be transmitted over an IP network to any location in the world with the same reliability and broadcast-quality of satellite service. As broadcasters move away from closed, inflexible legacy systems, they are starting to quantify the benefits of faster production and agile workflows.

Enriched content acquisition

Over the last decade, smartphone camera technology has evolved significantly. Today, anyone and everyone can be a content creator and consumers are now empowered in creating more content than ever before. Research by Cisco forecasts that by 2022, live video is expected to make up 17% of all video traffic on the internet. Meanwhile, IHS Markit estimates that the number of citizen journalists will increase by 145% each year, from now until 2025 and, with the aggressive rollout of 5G, live video transmissions will continue to grow exponentially.

This rapid growth of user-generated content (UGC) provides a major opportunity for media companies. Whether it is a clip of a celebrity sighting or footage of a nearby protest, the rise of UGC can enrich broadcasts by providing first-hand accounts, new angles and broader perspectives from the scene.

Cloud-based footage ingest gives producers the capability to acquire content from unlimited concurrent live feeds from multiple sources. This can include professional cameras, encoders drones, mobile phones and online sources including RTMP, RTSP, MPEG-TS, WebRTC, SRT, HLS and MPEG-Dash.

WebRTC applications are particularly important because they remove app dependency, enabling anyone to submit the video

to production without signing up - an aspect that is crucial in urgent and time-critical situations. This feature can be used for remote interviews; call-ins; obtaining voices live from the scene by switching the programme to the on-site mobile reporter; remote talent; fans in a football stadium or even a citizen who is in the vicinity of an incident.

Optimised production through ML-enabled content curation

Many news and sports organisations are relying, more than ever, on freelancers or stringers to provide content. These use cases are somewhere between full-time, known staffers working from the field and traditional UGC workflows where you need to verify the authenticity of a contributor before using the video on-air. As broadcasters continue to harness transmissions of live video over IP networks and begin to use cloud-based footage ingest to tap into an extensive number of sources, they will begin to open a treasure trove of content.

Looking towards the 2020 Tokyo Olympics, one can begin to imagine that video sources, both amateur and professional, will be covering every minute of every event: not just the sports in the stadiums, but local coverage of the fan experience outside the venues, the excitement across Tokyo and updates from the athletes themselves. Yet, this would be a massive amount of video content to manage.

Luckily, Machine Learning applications (sitting on cloud-based infrastructure) can simplify mass content management by automating the manual tasks in the video workflow to acquire and filter multiple assets and sources. As streams from multiple inputs are ingested, they are collated into a browser-based master control room with a continuous playback multi-view. By utilising metadata, content creation is simplified for the editorial teams as they can filter contributors and explore sources by configured inputs such as professional cameras, mobile contributions and geolocations.

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This technology enables producers to develop new show formats around sport-specific, team-specific and athlete-specific live channels, interweaving authentic, localised live coverage and creating a whole new level of hyper-personalised viewing experiences.

Platform-agnostic content distribution

Over the last ten years, we have observed a drastic increase in audience fragmentation as social media and OTT digital platforms took off. In the UK, a recent study revealed that the use of TV for news is much more likely among the 65+ age group (94%), while the internet is the most-used platform for news consumption among 16-24s. Meanwhile, in the U.S., Pay-TV still dominates the sports landscape, but audiences are increasingly shifting to digital video platforms as companies, such as Amazon, Facebook and Twitter, are bidding for streaming rights for games.

However, taking advantage of the number of new channels available can considerably expand reach. Broadcasters need to transition towards a platform-agnostic distribution approach. The move to cloud infrastructure is helping broadcasters to adopt a fragmented landscape by giving them the ability to simultaneously distribute programmes to unlimited outlets. This means that a single programme can be delivered across more channels than ever before including, linear, OTT and

social media. Adopting this strategy has already led content from emerging genres and underserved markets to establish a worldwide following of millions.

The key to delivering content for the ever-growing number of platforms is to prepare individual streams, with the appropriate markers and triggers, to enable monetisation of each platform.

Streamlining monetisation through dynamic ad insertion

There is a growing trend of content being delivered to multiple destinations from the cloud. Yet, every single destination will require a specific set of markers to trigger advertising. It becomes a laborious process to get ads to run effectively across each and every platform, especially with global audiences, as not all ads will be relevant to specific markets or individuals.

The best way to streamline ad delivery is by integrating a dynamic metadata customisation service in the cloud. By leveraging the cloud's ability to create multiple profiles of the same channel downstream, ad applications can stitch custom targeted video ads into streams.

Channel distribution workflows must include a rich set of metadata, either in-band or out of band to support downstream

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platform requirements. The primary use case here is the desire to provide unique, targeted ad inventory either on a per-platform basis or ideally on a per viewer basis, where the platforms allow.

Tight integrations with automation, cloud playout and traffic systems provide the content-specific information required to make downstream insertion more valuable. But information alone is not the only key to monetisation. Advanced notice to a downstream decision and ad serving systems enable more intelligent decisions and, ultimately, more valuable ad replacements leading to higher CPM rates.

OTT and MPVD platforms often require different SCTE or metadata versions, so a streamlined and automated approach to customising each channel delivery, per platform, is critical. Lastly, content replacement is often required as not all programming is cleared in all regions or across all delivery options (cable, satellite, internet, mobile etc.). Reliable, frame-accurate signalling, including business rules, is necessary to scale distribution with content replacement requirements.

Content syndication through the cloud and the importance of robust IP networks

IP workflows are also being leveraged by some of the largest American mass media news conglomerates. By moving to the cloud, these media giants are able to generate, share and syndicate content seamlessly while simplifying the process for onboarding new affiliates.

Cloud applications provide these networks with a broad set of digital workflows in a unified system, and the ability to publish content to social media platforms as well as broadcast stations at scale. They are able to route, monitor and curate content in the cloud for syndication and distribution, creating cost and time-saving efficiencies across the board - especially when compared to doing this via satellite.

It is important that broadcasters pay close attention to the transport solutions available as it is unacceptable for a stream to go down during a live broadcast. It is critical that broadcasters leverage robust IP networks for more cost-effective and reliable delivery of low-latency, broadcast-quality live video.

The stages of IP workflow optimisation

Eventually, every element of the workflow will become IP-based, but this journey will not be the same for everyone. As different broadcasters have different needs, the transition has to be done in phases (depending upon where they currently sit).

Today, it is possible to transition all production workflows to IP contribution and distribution. Over time, the ultimate efficiency will come as facilities move from SDI-based plants to IP plants. Once these IP-enabled systems are set up on-prem, they will become an extension to cloud-enabled workflows and transmission, but this often requires a hardware change so it will take some time.

Significant value grows when moving content exchange, distribution, syndication from satellite and expensive point-to-point fibre networks to the cloud and automating manual tasks through Machine Learning to create business efficiencies. We are finding that TV networks with many affiliates see the cost and complexity of content exchange reduced significantly in this phase.

The final, and perhaps most creative, phase is about achieving new IP-based formats - turning content consumers into content creators.

