Send once, signal many:

Channel decoration and distribution on the LTN Network

A white paper by LTN Global

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Introduction

Consumers love streaming — both ad-based and ad-free. And while cable TV has suffered subscriber losses, local ad revenue continues to see growth. In the meantime, broadcast TV maintains a massive share of overall TV ad dollars, even while the industry works to improve the ROI of those ads. TV is exploding with possibilities.

But, from an execution perspective, all this possibility translates to intensified competition for attention, changing business models, and a list of non-standard technical delivery requirements.

To the teams that manage large-scale TV operations — from broadcasters to multichannel video distributors to digital-first streamers — the only thing exploding is workflow complexity and cost.

Within media facilities everywhere, this pattern has demanded that teams take new, bold approaches to increase scale, reduce costs, and support new ways to boost revenue. Many of these approaches are both cloud- and services-centric. And so too with channel decoration and distribution, where we see opportunity to combine novel approaches and technologies to achieve a step-change in benefits for our customers.

LTN Cue: A scale-up revolution for channel distribution

LTN Cue combines world-leading IP video transmission with a built-in control plane for linear channel metadata and ad signaling. LTN Cue connects with playout to read, transform, and insert SCTE 35 markers flawlessly — and in as many distributor versions as needed. All delivered as a fully managed service as the video is delivered en route to endpoints.

It's a revolution in scaling up channel distribution in ad-based environments. And it takes full advantage of the LTN Network, NOC, and managed service capabilities.

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But before we dive further, let's set the context for free, ad-based streaming in **Part 1.** We'll explain why we see linear metadata signaling as essential to capturing the next segment of growth of TV.

In **Part 2**, we'll outline how ad-signaling is done today and how it's evolving.

Finally, in **Part 3**, we'll dive deeper into the LTN Network along with some key use cases supported by LTN Cue.

Part 1. The Importance of linear TV metadata

Consumers love streaming — both ad-based and ad-free. And while cable TV has suffered subscriber losses, local ad revenue continues to see growth. In the meantime, broadcast TV maintains a massive share of overall TV ad dollars, even while the industry works to improve the ROI of those ads. TV is exploding with possibilities.

But, from an execution perspective, all this possibility translates to intensified competition for attention, changing business models, and a list of non-standard technical delivery requirements.

TV's third-era boom: Advertising supported

With $20 billion in global revenue in 2019, Netflix may have won the first battle of the streaming era. But the ad-free, premium home entertainment segment is a fraction of the $172 billion ad-supported free linear TV business globally, according to PwC's Media & Entertainment Outlook[1]. By itself, those two data points suggest a major forthcoming shift in ad budgets from linear TV into digital channels. Add two more:

First, streaming technology has matured in the last few years. It is now credibly able to deliver against the massive viewing hours supporting the live linear TV ad business.

Second, as live linear streaming became a technical reality, the smart and connected TV installed base hit critical mass. In the US, an estimated eighty-five percent of TVs shipped are SmartTVs[2] —nearly thirty-four million in 2020[3] . Seventy four percent of all HHs have at least one internet-connected TV device.[4]

1. PwC Global Entertainment & Media Outlook 2018–2023: https://www.pwc.com/gx/en/industries/tmt/media/outlook/segment-findings.html

2. World Cup Pushed Global TV Shipments to 221M in 2018: https://www.broadbandtvnews.com/2019/03/08/world-cup-pushes-global-tv-shipments-to-221m-in-2018/

3. Consumer Technology Association, 40.8 million TVs are forecast to be shipped in the US, Jan 5, 2020: https://www.cta.tech/Resources/Newsroom/Media-Releases/2020/January/Consumer-Tech-U-S-Sales-to-Reach-Record-$422-B-(1)

4. Multichannel News, Smart TV Penetration in US Now up to 32%, May 31, 2019: https://www.multichannel.com/news/32-percent-of-us-tvs-are-smart-tvs

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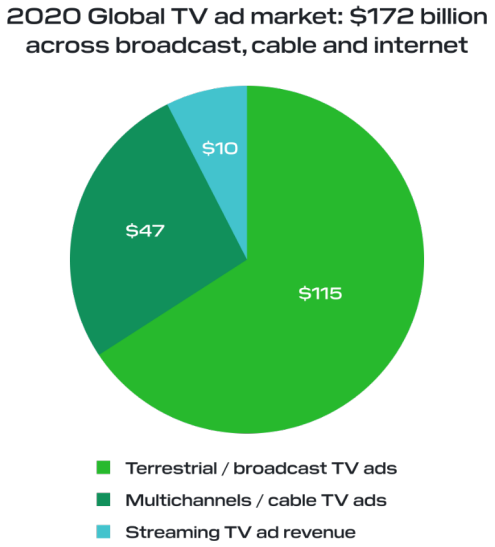
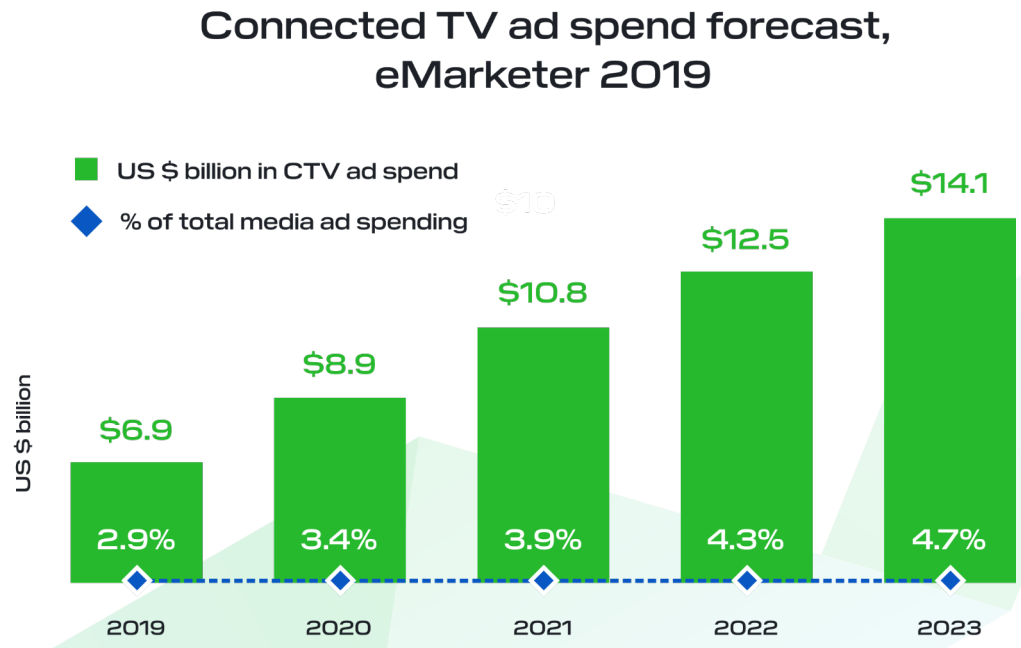


The conclusion? From eMarketer to Magna Global to Luma Partners to Digital TV Research, the consensus is that ad-supported streaming TV will anchor the next leg of TV growth. Today, the argument goes, a company like CBS serves only 200 advertisers.[5] Digital platforms leveraged great targeting, attribution, and performance to tap into a market of millions of advertisers. Dynamic ad insertion in cross-platform TV, they argue, will catalyze a similar growth trajectory. Their only dispute seems to be, what acronym should we give it?

Sizing a messy market: CTV, AVOD, FAST, OTT, and addressable

Given the installed base of connected TVs outlined above, it's not surprising that eMarketer forecasted connected TV ad spending to hit $14B in 2023, a compound annual growth rate of 20% over the four year forecast period.



5. Luma Partners, WFH Webinar, Stream Wars and the Future of TV, March 19, 2020: https://www.youtube.com/watch?v=boyyc8CadNs&feature=youtu.be

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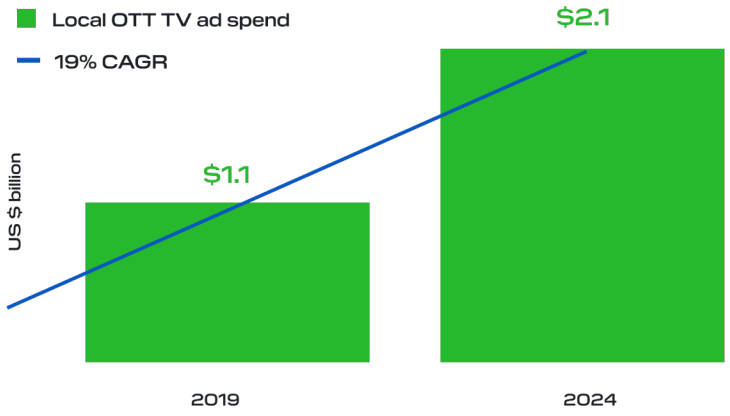
However, what this number excludes is notable. It does not include network-sold inventory from linear TV, some of which shows up on connected TV environments via authenticated apps, and may or may have been paid for. (Magna Global reports authenticated long-form video ads including in "full episode players" generated $3.2 billion in 2020.[6])

It also excludes household addressable ads, which totaled an estimated $2 billion in 2019.[7] This number could grow 10-fold in the coming years, according to ad industry expert Tracey Sheppach. The catalyst? Smart TV technology is on the cusp of being able to replace ads in linear feeds.[8]

Also excluded are FAST (free ad-based streaming TV) services, like Pluto TV, Cheddar, Wurl channels on Samsung TVs, Xumo channels on LG TVs, and many others. In the last year, Pluto TV grew monthly active users to 22 million from 12 million at the time of the $340 million Viacom acquisition.[9]

The figure may include some overlap with another slice of data most relevant for US broadcasters. BIA/Kelsey projects locally activated OTT ad spending will double to $2.1 billion over the next four years.[10]

Locally activated OTT TV ad spend to double by 2024



Last, Digital TV Research forecasts AVOD, or ad-based video-on-demand, will be a $20 billion US business in 2024, from $7.7 billion in 2019.[11] However, this projection includes forthcoming services like Peacock from Comcast NBCUniversal — which will feature AVOD, but also dozens of scheduled linear TV channels.[12]

6. Multichannel News, Viewer Watch 2020, January 6, 2020: https://www.multichannel.com/archive/viewer-watch-2020-the-charts

7. eMarketer, July 2019 revised forecast for addressable TV ads in the US across cable and satellite, and excluding Connected TV and OTT platforms: https://www.emarketer.com/chart/228889/us-addressable-tv-ad-spending-2016-2021-billions

8. AdExchanger.com, analysis by Tracey Scheppach, CEO of Matter More Media: https://www.adexchanger.com/tv-and-video/the-ad-free-disney-plus-wake-up-call-we-must-scale-universal-addressable-tv-now

9. FastCompany, Jared Newman, Why Comcast just bought a streaming service you've probably never heard of, Feb 27, 2020: https://www.fastcompany.com/90468341/why-comcast-just-bought-a-streaming-service-youve-probably-never-heard-of

10. BIA Kelsey data cited by Wall Street Journal, Feb 26, 2020: https://www.wsj.com/articles/nbcuniversal-opens-new-local-ads-business-for-streaming-tv-11582714801

11. Digital TV Research as cited by Luma Partners, WFH Webinar, Mar 19, 2020

12. Quartz, Peacock is trying to recreate the experience of watching NBC in the 1990s, Jan 17, 2020: https://qz.com/1786372/nbc-wants-peacock-to-be-like-how-you-used-to-watch-tv/

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Frame-accurate linear metadata

For the growth of these linear hours to turn into revenue, millions of ad breaks need to be precisely signaled, decided on, and inserted into the consumer video delivery chain. In turn, that requires TV metadata aligned with a program reference clock at a frame-accurate level. This linear metadata is similar to consumer TV guide information like “What’s on now?” and “What’s on next?”, but at a more granular level including timing data about ads, pods, blackouts, and program boundaries.

- When exactly should I break for an ad?
- Which type of ad should I show at exactly this time?
- For how long should I show it?
- Is there a sports rights blackout for the next scheduled program?

Content descriptions, frame-accurate splice points, content and ad identifiers, and rights restrictions are all part of the time-stamped records that will help to define many downstream channel innovations over the next twenty years.

- Switch the feed at 08:00:03.00
- Place an ad at 08:01:01.00
- Trigger a graphic overlay at 08:01:03.30
- TV show #1 starts at 08:05:00.00

It is a deceptively simple idea. Not only video metadata, but linear channel timing signals that determine what’s on, and precisely when — all managed and signalled down to the millisecond from one place, and across many distribution platforms.

Converged ad workflows across broadcast, cable, and internet

As with every digital media revolution before it, streaming may become a dominant form of TV delivery, but it’ll never replace existing formats. It’ll be additive.

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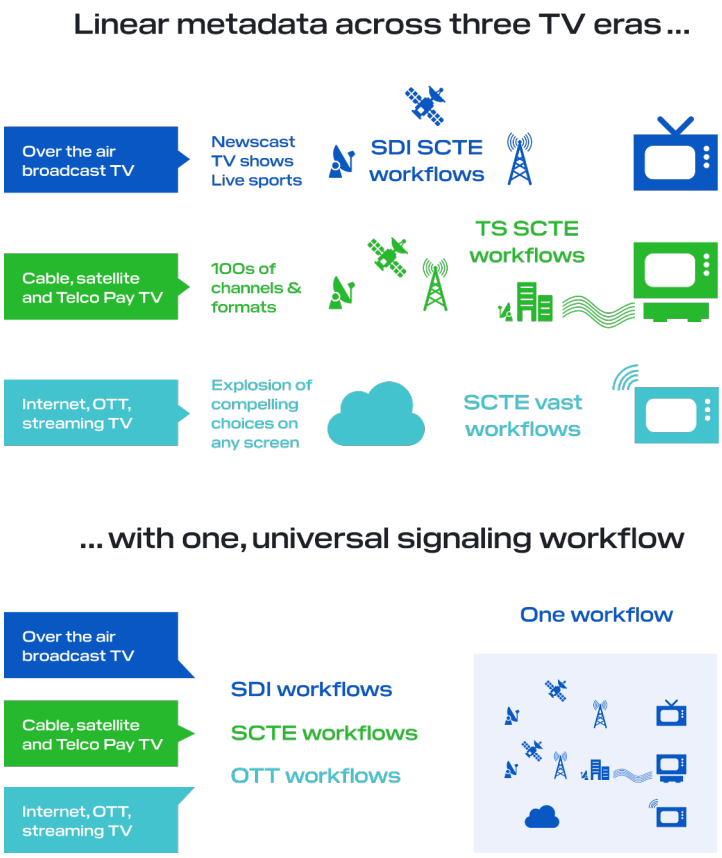

That fact means all media companies need to support every platform. Digital-first channels should distribute to local cable platforms. Broadcast station groups need to launch new channels for streaming destinations.

The only way to build workflows that are more capable, scalable, reliable, and cost effective for this new TV reality is to build a unified workflow across these value chains.

Radically different infrastructure is required to (a) broadcast a 24/7/365 feed via TV transmitter; (b) place 10,000 encoded, protected and efficient video files on a server, and (c) send low-latency live linear streams — each with localized ads and perhaps even ad loads — to distributors across Asia, Australia, and the Americas for example.

Managing channel distribution with one centralized linear metadata control plane provides flexibility and control — which is essential to optimizing ad revenue that occurs downstream.

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Monetizing downstream: Flexibility and control

As a continuum of free ad-based, ad-light, and subscription TV platforms grows globally, competition will drive innovation and differentiation. This opens opportunities for channel providers and distribution partners to strike new TV ad partnerships that deliver better results for viewers as well as both commercial parties.

For example, a channel provider could enable specific ad models or even time-shifted content creation events to be signaled as part of the video delivery workflow. This typically includes geography-specific content restrictions or ad replacements and localizations.

What does this mean for the requirements that TV channels need to meet? They'll need to:

1. Enable targeted advertising and content replacement scenarios at a regional level
2. Remotely verify and control content ingest and connect points
3. Reliably execute sports blackouts and similar content rules from complex contracts
4. Display customized graphic overlays with precision timing
5. Drive more agile and efficient video processing workflows at the edge of the network
6. Enhance visibility and scale-efficiencies within broadcast station group O&Os

In this world, linear metadata versatility is a watch-phrase for the explosion of distribution and delivery possibilities. LTN's approach — combining internet video transport and a linear metadata control plane in the cloud — gives media companies leverage to tap into the future of TV advertising workflows.

Part 2. Cable TV standards for OTT ads?

Quality of attention: Job #1 for TV ad tech

What does a better quality viewing experience mean? Above all, we want to minimize any viewing distractions. We know from a long list of consumer surveys that video buffering, delays, and poor quality ad splicing can distract and frustrate viewers, causing them to tune out.

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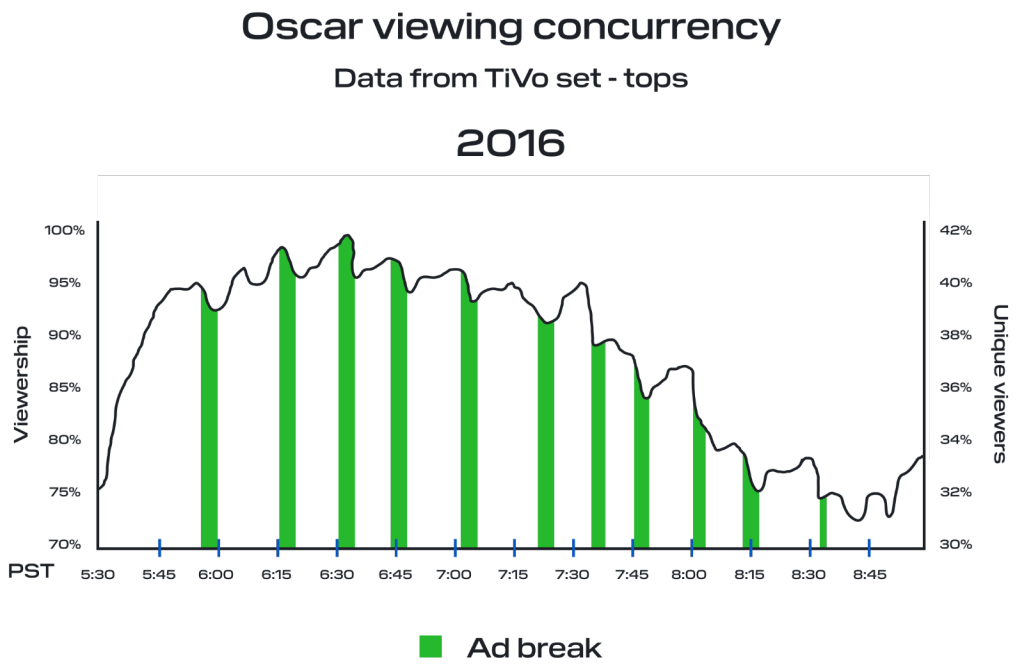

To help visualize that challenge, the diagram to the left presents some proprietary historical viewing data presented by Rovi (after it acquired TiVo) at a conference in 2016. The red vertical bars show ad breaks, and the black line shows what happens to viewership across time. The immediate loss of viewers at the start of each break — even for a tent pole event like the Oscar's — underscores the mission: making TV ad breaks as precise and seamless as possible.

It requires agreed-upon linear metadata standards for communicating and signalling time-based content playout actions. What. And when. Every millisecond, 24/7/365. SCTE 35 attempts to be such a standard.

Strong standards, fuzzy implementations

ANSI/SCTE 35 was originally developed as a way to insert local cable ads and has evolved to mark multiple types of linear metadata, including ads, breaks, and program boundaries across different delivery platforms. But SCTE 35 has challenges.

First, no uniform implementations exist.

In some cases, playout implementations interpret fields and data records in slightly different ways. In advanced use cases, a slight variation in signaling may be required, and yet still comply with SCTE 35. In other cases, distributors may simply have a house standard that requires programmers to create a new channel feed for a specified decoration profile.

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Originating multiple channels for different SCTE variations just doesn't make sense. It requires multiple playout systems, multiple cloud egress fees, and other workflow waste.

There is a second challenge with SCTE 35. Markers are often corrupted or removed by existing video processing infrastructure, causing operational errors and unfilled advertising inventory. The timing of these marks can, in some conditions, require an out-of-band resynchronization.

As channels and distribution outlets are added, these challenges compound and grow.

Media companies with even a few channels to distribute to 10 or 15 video distributors have taken on major technology investments that required complex integrations with playout, disruption of existing broadcast networking infrastructure, and the introduction of a new source of operational errors.

Table 1. Executive glossary of SCTE 35 and related standards

Specification	Summary description	Industry state
SCTE 104	Specifies how to trigger an ad insertion in what is called the vertical ancillary blanking interval, or VANC, of an uncompressed, baseband video.	Specifies how to trigger an ad insertion in what is called the vertical ancillary blanking interval, or VANC, of an uncompressed, baseband video.
SCTE 35	Originally local cable digital program insertion, this in-band video standard is now used to signal all kinds of program and ad events inside linear transport streams as well as new adaptive bitrate (ABR) formats like HLS and DASH.	Widely used and relied upon ad-signaling standard that is implemented in many diverse and incompatible ways in today's deployments. It remains under-leveraged with respect to ad-monetization strategies.
SCTE 224	Event schedule notification interface expands and enhances the ability to execute viewing policies and business rules based on audience characteristics, such as DMAs, devices, or Zip.	This standard was released in 2015 and updated in 2018. It has gathered acceptance as an important standard to ensure MVPDs have accurate program guide information upon which to apply policies. It works best in conjunction with SCTE 35.
SCTE 130	Specifies ad management workflows, including: initiating, and reporting on, ad requests to an ad-decision service; storing placement opportunities; creative availability; and subscriber-related data.	This standard is used in the cable ad domain. For streaming ad workflows, the Interactive Advertising Bureau (IAB) VAST standard defines ad workflow between players and servers.

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Better SCTE: A cloud approach to channel distribution

Instead, LTN Cue provides TV channel programmers with a novel approach. It's a fully managed service that not only decorates your channel with the proper SCTE 35 markers as required by the distributor, but also transports the feed to any destination globally.

Unlike the traditional method of implementation, where the insertion is done on-premises as part of playout automation, with LTN Cue, all of it happens on the LTN Network. Think of it like a cloud approach, only better. LTN Cue simplifies:

- Implementation, using existing capabilities of playout and compression systems, without requiring new equipment or software in most cases
- Creating multiple variants of content and video metadata for multiple targets with a single video signal egress
- Adding new over-the-top, cable, or satellite video distribution partners without changing anything on-premises
- Bundling with channel video transport on the industry-leading, five-nines reliable LTN Network

Part 3. LTN Global: One network, many services

Architecture innovation: The benefits of the LTN Network

LTN Global is a pioneer in utilizing dynamic, multicarrier routing over the public internet to build a fully redundant, fully managed private video network. The LTN Network is complex. Think of it as a sophisticated private cloud, bringing customers not only low latency, reliability, and agility, but concrete scale — with an unprecedented global footprint of 3,000+ connected media sites, including video ingest points for streaming, cable, and satellite services.

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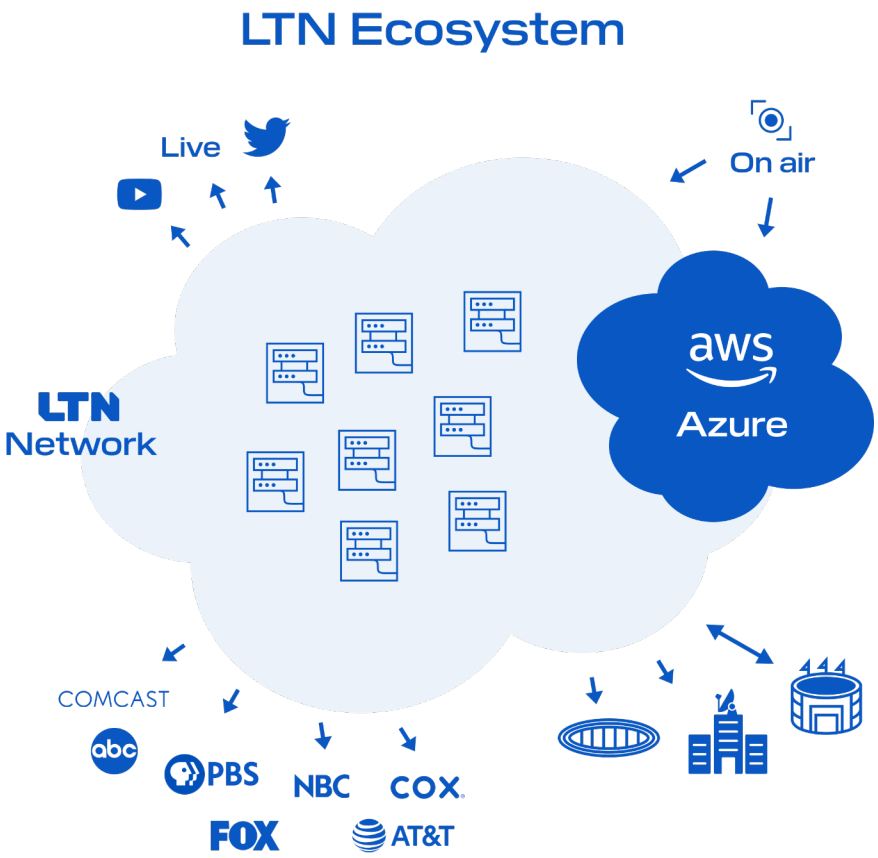

This comprises what we call the LTN Ecosystem, depicted in the diagram at left.

The LTN Network brings many benefits to our LTN Cue service.

- **Revolutionary video networking technology** — LTN Global is the inventor of dynamic multicarrier routing to deliver broadcast transport streams around internet congestion
- **Commercial pioneer in managed services** — Fully managed hybrid-cloud video contribution and distribution
- **Outstanding track record of reliability** — Five nines and zero outages
- **Lightning fast** — <200 milliseconds[13] from anywhere to anywhere on the network
- **Securely encrypted** — AES128 w 2048-bit keys
- **Growing and building capacity** — From 10 gig today to 100 gig connections in multiple diverse and redundant tier-one ISPs
- **Twelve major data centers globally** — And the ability to deliver anywhere

13. Within the US; <300ms worldwide across the LTN Network

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Business innovation: The LTN Ecosystem vision

LTN Cue channel metadata services represent a combination of our Transport pillar with the proven linear metadata and ad-signaling services pioneered by our Signal pillar.

Cue is one solution of many that comprise the LTN Ecosystem, which offers synergistic services that drive efficiency and value from end to end, such as: channel monitoring, remote production, social streaming distribution with cloud video master control, digital playout scheduling, and our fully managed video transport network for guaranteed IP-based live video delivery.

Growth use cases: Splicing streams, inserting dollars

The LTN Cue service enables digital ad insertion, linear-to-VOD workflows, content replacement, regionalization, and distribution rights enforcement across various distribution platforms and technologies.

Here are additional examples of the growth-driving use cases ideal for LTN Cue.

Scale-up distribution for ad-based streaming TV

For cable channels negotiating distribution agreements with a virtual MVPD like Sling TV, Hulu with Live TV, or YouTube TV, the video feed will have to comply with local avail ad inventory marked with a specific, and likely unique, SCTE 35 marker profile for each distributor.

Some video feeds will also need additional markers to indicate more details, such as program titles, chapter numbers, each ad break, and maybe individual ads. The specific markers are determined by the terms of the distribution agreement the cable channel has with each service.

In this case, LTN Cue makes it simple to send a single feed to the LTN Network, and have the LTN Cue service create multiple versions of each channel without requiring additional playout systems and multiple duplicative transport.

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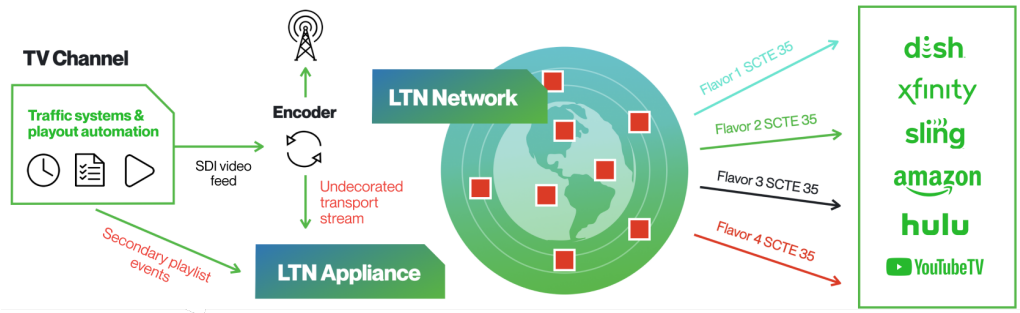
LTN Cue: Transport + SCTE Markers



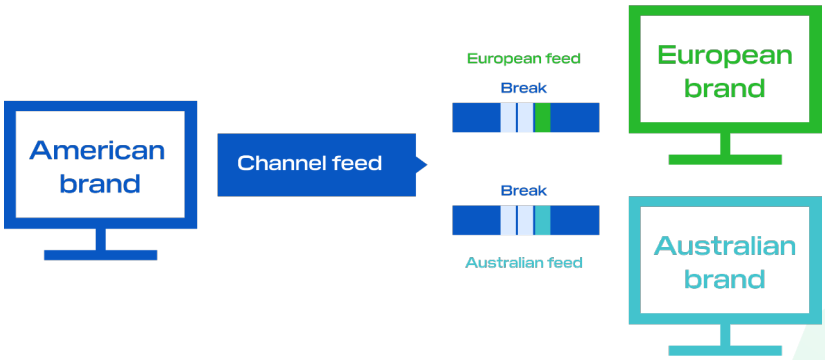
Advanced TV ad signaling for international distribution partnership

Surprisingly, many cable channels with international distribution have under-monetized existing ads placed in the originating feed.

If those ads are relevant to the local market, the channel originator can negotiate with the media buyer to account for the impressions and share revenue with the international distributor.

But, if they are not relevant for the local market, the channel and distributor can agree to replace the ad with a regionalized ad for local market consumers.

UC2: Ad localization for out-of-market channel distribution



Local TV stations stream direct-to-consumer

Stations have rights to stream local news to O&O-streaming D2C apps, but do not have rights to include national content feeds. They need to replace content that has streaming restrictions.

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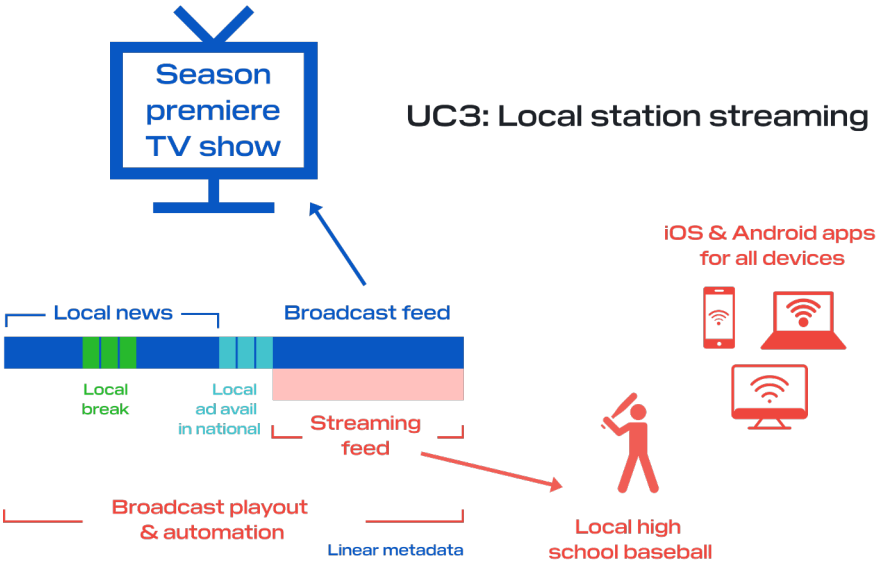
Also, they possess ad inventory in both national and local feeds. Ad breaks on these diverse feeds are often improperly marked, leading to missed fills or transitions that distract audiences and catalyze channel changing.

By leveraging world-class linear metadata operations, channels can now easily pivot toward direct-consumer streaming strategies while protecting their core business and operation.



Other use cases for LTN Signal capabilities

In addition to the workflows described in the previous section, we encourage readers to reach out to your sales representative and schedule some time to learn more about a range of advanced workflows on the following topics.

Dynamic ad insertion with content targeting rules

Linear metadata markers can also help to drive a wide range of advertising and content customizing workflows using business rules triggered off everything from content descriptions to EPG scheduling information to ad-ID records. For example, ad insertion workflows can be built into programmatic strategies that require inventory to be excluded from certain advertisers.

Distribution rights enforcement

Sports content is notorious for requiring complex blackout capabilities. Our solutions include SCTE 224 solutions that make it easy for streaming distribution

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partners to comply with blackout restrictions. Our services enable partners to know when embargoed content starts and ends.

Live-to-VOD and future of video user experience

Time-shifting use cases where downstream workflows can be used to execute a time-based transformation of the media, such as indexing, personalization, or replacement workflows.

Conclusion: Channel management on the LTN Network

This paper has covered some details of SCTE 35, 224, and linear metadata signaling. We've also provided context for why these workflows are strategic and how they enable advanced TV advertising across multiple platforms.

We've provided data that can help you create a business case for transforming channel distribution and decoration workflows. We've provided some important facts about LTN Cue and have a detailed service brief available if you'd like to learn more.

We concluded by illustrating specific use cases and workflows serviced by LTN Cue that can catalyze new growth for you, including several variations on advanced TV ads.

Ultimately, that's where the greatest possibilities lie. Better targeted ads are more pleasant for viewers — and can be sold at a higher price to advertisers. Ads that are reliably precise ensure minimal distraction for viewers. Removing costs and inefficiencies is helpful. Removing errors is better. The ability to repair ad signals? Or create smarter ones on-the-fly? Next-level.

And it's at this intersection of: a shift to free, ad-supported linear streaming TV; a long-term blending of TV across platforms; and the rise of global cloud computing with precision-timing — where we see white space for innovation with customers. We welcome the conversation.

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LTN GLOBAL

LTN® Global is a worldwide leader in video technology solutions for producers and distributors of broadcast-quality content. Built on the world's fastest and most reliable IP multicast network, LTN's universal media ecosystem unites modular services and integrates with other leading technologies to bring full-video-chain workflows, driving scale from creation and acquisition to monetization and delivery. LTN has been connecting the world with transformative video experiences for more than 12 years and continues to make content more valuable and relevant to media organizations and global audiences.

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