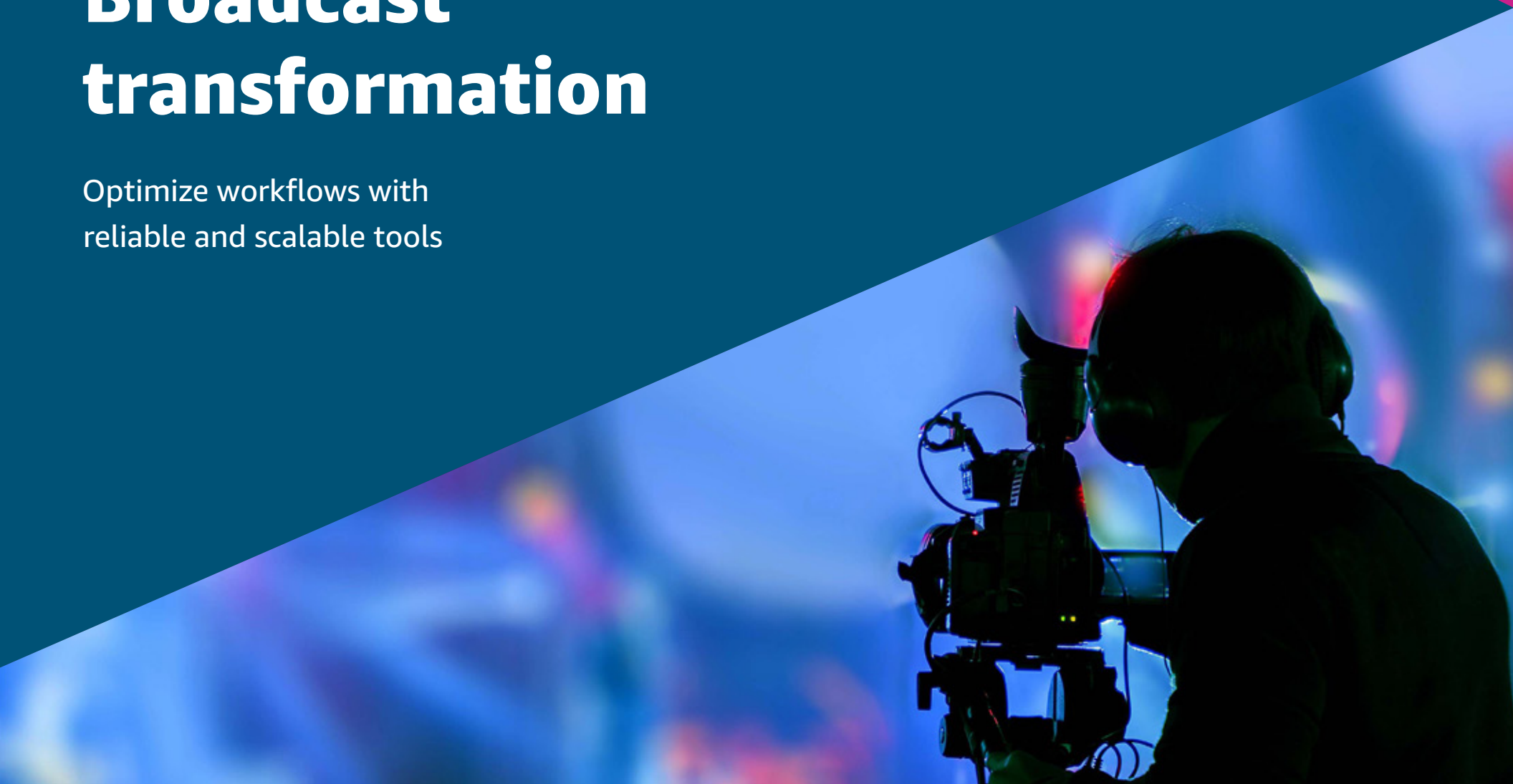
Broadcast transformation

Optimize workflows with reliable and scalable tools



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The modern broadcasting landscape

The average adult spends 26 hours per week watching television—including live, on demand, and DVR—according to the 2020 Nielsen Total Audience Report.[1] That's about two-thirds of an average workweek. Among those hours spent watching a screen, 19 percent of viewers watch via streaming services.[1] Just a couple of years ago, 39 percent of people watched content live versus on demand.[2] In late 2020, streaming content represented a quarter of all television minutes viewed.[3] And alongside an increased demand for content, consumers can now shift platforms faster than ever.

As a broadcaster, you want to ensure that your content is delivered seamlessly, no matter from where in the world or on what device the audience watches—and that you can constantly adapt.

As with many industries, broadcasters' long-term plans to move to the cloud quickly accelerated in 2020. In addition to the unprecedented health crisis that impacted the way people live and socialize, the year also saw technological changes with lasting impact:

- A global workforce, already on the rise, has accelerated and is more commonly accepted across industries
- Next-gen distribution—and acceptance of IP as primary distribution—has arrived
- Broadcasters can now perform live production and playout in the cloud

While traditionally rooted in on-premises technology, modern broadcasting is moving to the cloud, offering opportunities to expand and innovate. In this eBook, you will learn about modern broadcast solutions built on the cloud for broadcast playout, remote live production, distribution, and discover how customers and AWS Partners are using specific Amazon Web Services (AWS) solutions and leveraging the scale, agility, and global reach made possible by the cloud.

[1] The Nielsen Total Audience Report, February 2020.
[2] "Only 39% Of Viewers Choose Live TV As Their Default Option – Study," Deadline, July 2018.
[3] The Nielsen Total Audience Report, August 2020 ("Special Edition: Work-From-Home").

Behind the screen: What broadcasters do

Whether you're a national broadcaster, an independent station, or an owned-and-operated affiliate, your business is based on delivering superior service to your audience. Yet, there are many choices and decisions to factor in.

One consideration is the type of broadcasts or channel playout that you'll be programming, including pre-produced programs, live sports and news, and ads and promos that are woven into the fabric of the shows at preselected and paid-for time slots.

There are also choices in delivery and distribution. The colloquial term "TV" has broadened to include over the air (OTA) and multichannel video programming distributors (MVPDs), both part of primary distribution. In addition, there is over-the-top (OTT)/TV everywhere (TVE) distribution, or delivery over the internet.

Broadcasters require multiscreen solutions that scale as the video delivery market evolves.

The differences between broadcast and OTT

Broadcast	OTT
Linear playout, with or without live elements	File-based/on-demand model
Delivery OTA or via MVPD/cable provider	Internet delivery
Can include virtual multichannel video programming distributor (vMVPD) services, such as Hulu + Live TV, DIRECTV STREAM, and Peacock	Could include live streaming iteration of linear channel
Mature monetization models: Ad revenue MVPD subscription revenue	*Multiple monetization models:* Ad supported Subscription Transactional

Broadcasting workloads

Today's viewers watch TV across a multitude of platforms and devices. As a broadcaster, you want to be aware of all the existing formats and anticipate what's coming—which can create a glut of processes within your delivery pipeline.

Let's look at three phases of the broadcast pipeline: acquisition, broadcast playout, and distribution.

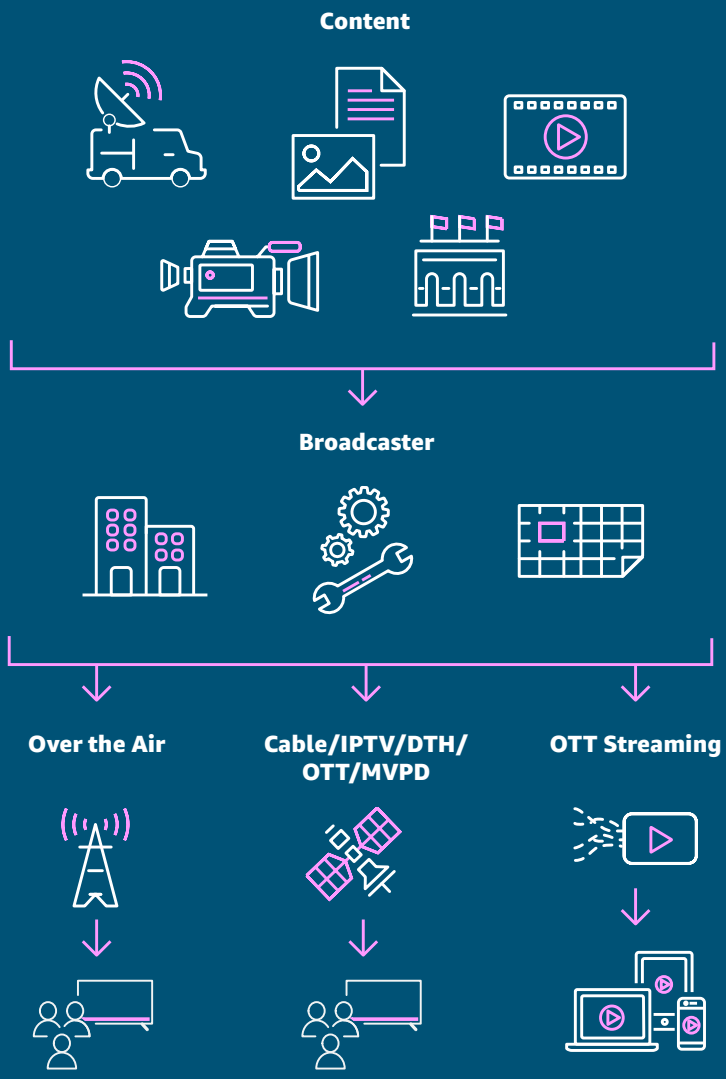
Phase 1: Acquisition

Broadcast content originates somewhere, be it live in front of a news camera, at a sporting venue, or pre-produced in a studio or on a set, and is then scheduled alongside other programming content. During the acquisition phase, broadcasters source pre-produced or live content and prepare it for playout and distribution.

Live production is most common for news and sports content. It refers to deploying live and live linear channels in a workflow and delivering the content to regional or even worldwide audiences. In a live production scenario, a program is produced at a venue or in a studio (or a combination of the two), and the resulting program is fed into a broadcast operations facility, channel branding and commercial breaks are inserted, and the output is sent on to the distribution chain.

Supply-chain processing can be utilized on any incoming content but is typically applied to pre-produced content. The process includes receiving program files and supplemental assets (closed captioning, subtitle files, artwork for OTT platforms, etc.) and registering those assets with a media asset management system; it can include additional processing like encoding or transcoding, quality control checks, program formatting, and archiving.

The broadcast pipeline, from acquisition to distribution.



Phase 2: Broadcast playout

The broadcast or network operations center is the technical hub of a broadcast operation. Broadcasters switch from various feeds and sources, play ads, add graphics and closed captioning to programming, and monitor the output.

Phase 3: Distribution

Like any distribution model, this is the “last mile” in the process of getting content in front of viewers. This phase includes encryption and compression as well as delivery—be it OTA, linear OTT, or MVPD.

The modern broadcasting glossary

Cable, satellite, or terrestrial: Traditional, physical infrastructure broadcast mechanisms

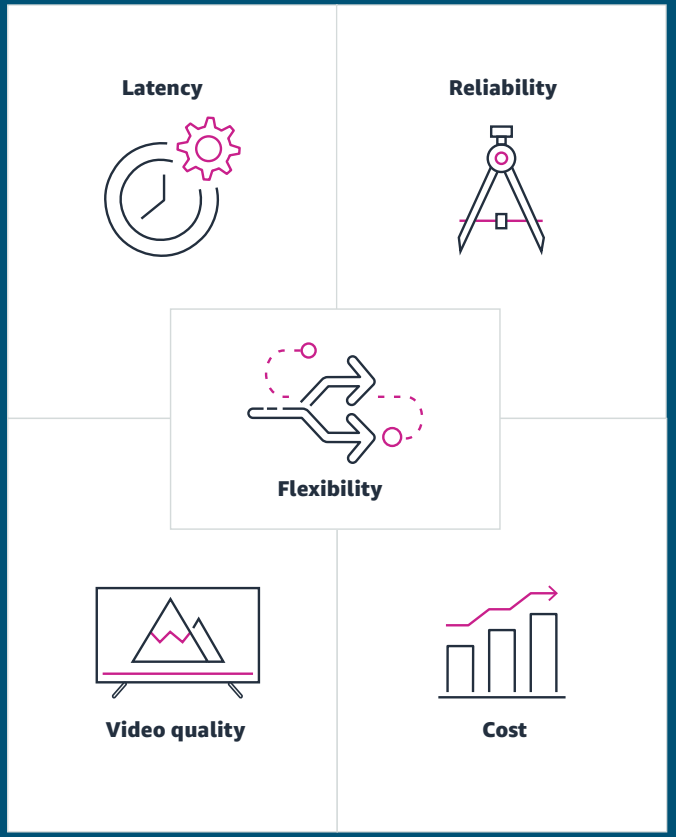
CDN: Content delivery network
DTH: Direct to home
IPTV: Internet protocol television, aka delivery over internet
MVPD: Multichannel video programming distributor
vMVPD: Virtual multichannel video programming distributor
OTA: Over the air
OTT: Over the top; may include OTT streaming or OTT/TVE
OVD: Online video distributor
TVE: TV everywhere
VOD: Video on demand

What broadcasters need

Broadcasters, regardless of delivery method, universally seek the same things:

- **Flexibility**—which underpins personalization and regionalization
- **High bandwidth and low latency**—whether content is live or pre-produced
- **Reliability and quality**—both are essential to the customer experience
- **Efficient, cost-effective operations** across infrastructure
- **Audience engagement**—which leads to sustained or increased views

Broadcasters' top concerns



Changing the game with the cloud: Leverage cloud economics and optimize your talent

A fully cloud-based broadcast model allows scale, agility, resilience, and innovation across key broadcast workloads.

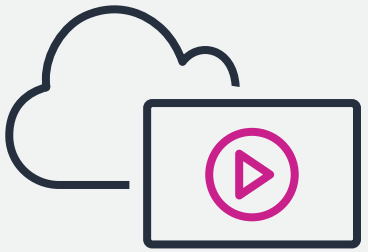
When you make the move to broadcasting in the cloud, you switch from a capital expenditure (capex) model to pay-as-you-go.

You can optimize your infrastructure to use the right tools for the job, rather than being constrained by the specific infrastructure that you own or lease on premises. And you can innovate. You can choose from more than 175 AWS services to use once you are fully in the cloud.

And, with cloud-based workflows, you are now able to use talent wherever it is located—realizing the possibility of a remote, distributed workforce and finding the best talent for the job at hand. AWS Global Infrastructure is supported by AWS Regions, Availability Zones, and Points of Presence (PoPs). With the worldwide footprint and high-bandwidth network of AWS, you can go global in minutes.

Broadcasting in the cloud trend: Cloud networks are different than on-premises.

Yes, you need to learn what's different, but once you're in the cloud, you have expansive possibilities for innovation and optimization.



Broadcasting in the cloud trend: Remove undifferentiated heavy lifting.

Undifferentiated heavy lifting refers to all of the hard IT work that companies do that doesn't add value to their mission, such as devoting resources to building and maintaining storage and networking.

Customers can use the following AWS products and services to support a cloud-based broadcast infrastructure:

Storage/Archive

By storing content on cloud-native architecture, your content and metadata can be optimized to service multiple supply chain requirements, and you no longer need to be concerned with common points of failure, like tape archive robotics or data loss because of data tape breaks.

Services spotlight: Amazon Simple Storage Service (Amazon S3), Amazon S3 Glacier, and Amazon S3 Glacier Deep Archive.

Transport

You can transport media assets into and out of AWS in a variety of ways, leveraging standards-based mechanisms and utilizing input source failover support with services like AWS Elemental MediaConnect.

Services spotlight: AWS Direct Connect and AWS Elemental MediaConnect.

Distribution

Deliver your content to viewers.

Services spotlight: AWS Elemental MediaConnect and Statistical Multiplexing (Statmux) for MediaLive.

Today, AWS customers run 2,900+ channels in the cloud.

Applying AWS services to your broadcasting workflow

Playout and production are foundational workloads for broadcasters. These mature, reliable workloads underpin broadcast customers' daily business. In this section, we examine two key workloads: broadcast playout and remote live production.

Broadcast playout is where the magic happens, from content scheduling and playout to graphics/caption additions and more. In this phase, the bulk of work is done in the broadcast operations center.

Using the cloud, you can leverage efficiency and scale not previously possible with physical infrastructure and tools.

Remote live production is essential in today's modern broadcast landscape. With the sheer amount of live content happening at any given moment, it's impossible for broadcasters to have teams "on the ground" supporting every event or newscast. Broadcasters require the ability to produce content remotely, from a studio or even from hubs around the world. The cloud makes this possible.

Customer Examples

There's no better way to showcase the possibilities of the cloud for broadcasting than to share how AWS customers are implementing these solutions. Let's look at some of their stories:

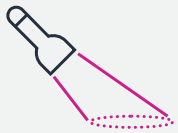
VIACOMCBS

ViacomCBS chooses AWS as its preferred broadcast cloud provider

ViacomCBS had disparate, siloed platforms for each of its networks, used by a global team to create, manage, and distribute media. In order to build a common set of cloud-based platforms, ViacomCBS and AWS announced plans in December 2020 for a strategic agreement that names AWS as the preferred cloud provider for ViacomCBS's global broadcast media operations. ViacomCBS will migrate operations for its entire broadcast footprint—which includes 425 channels and 40 global data centers and production facilities—to AWS.

The migration will allow ViacomCBS to improve operations and costs, simplify access to content for its licensing partners, and deliver more content and new viewing experiences on any device to viewers. The new cloud-based broadcast and media supply chain operating hub will help ViacomCBS spin up new channels faster, as well as dynamically assemble live content and optimize delivery over any distribution channel.

Read more about ViacomCBS ›



Solutions spotlight

AWS Media Services, Amazon Rekognition, Amazon SageMaker, and AWS Global Infrastructure

FOX

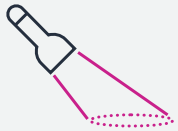
FOX achieves next-gen distribution and keeps maturing on the cloud

In 2019, FOX Corporation and AWS entered a multiyear strategic collaboration for the network to use AWS services to distribute FOX's sports, news, and entertainment television content to MVPDs, affiliates, and OTT providers.

FOX was quickly able to adapt to rapid changes in viewer behavior, respond as new platforms and models emerged, distribute content flexibly, and be nimble with its global broadcast models. Yet, as FOX continued to mature, it needed new flexibility, scale, and the ability to handle bursty traffic during special events.

As AWS and FOX's relationship continues to grow, the network has plans to launch a primarily AWS-driven playout in the near future.

Read more about FOX ›



Solutions spotlight

Amazon S3, Amazon Elastic Compute Cloud (Amazon EC2), AWS Professional Services, and Amazon MQ

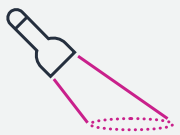
DISCOVERY

Discovery accelerates innovation and reduces linear playout infrastructure costs

Discovery, a global leader in real-life entertainment, delivers more than 8,000 hours of original programming annually with content available in more than 220 countries and 50 languages. Discovery wanted to modernize its infrastructure for linear playout programming to maintain its leadership position in a rapidly changing industry.

As Discovery's preferred cloud provider, AWS powers the vast majority of the company's infrastructure needs. Using solutions from AWS and AWS Partners, Discovery migrated more than 450 global linear TV channels to the cloud, decommissioned its data centers and physical playout hubs, and lowered its infrastructure costs by 61 percent. The broadcaster's new cloud-based, flexible business model enables it to stand up short-run channels for major events.

Learn more about Discovery ›



Solutions spotlight

AWS: Amazon S3, Amazon EC2, and AWS Direct Connect
Evertz Microsystems: Mediator-X, OvertureRT LIVE, and Render-X

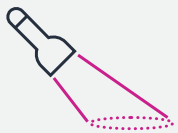
PGA TOUR

PGA TOUR tees up with AWS to reimagine the fan experience

By showcasing golf's greatest players, the PGA TOUR (TOUR) engages, inspires, and positively impacts fans, partners, and communities worldwide. Looking to boost fan engagement and streamline its video production and delivery workflow, the TOUR enlisted AWS as its official cloud partner.

AWS powers machine learning, natural language processing, storage, compute, analytics, and database capabilities for the TOUR, delivering an enhanced golf fan experience across tournaments. The TOUR also harnesses AWS Media Services to give golf fans more control over their experience with the groundbreaking application "Every Shot Live".

Learn more about PGA TOUR ›



Solutions spotlight

Amazon S3, Amazon Rekognition, AWS Elemental MediaConnect, AWS Elemental Live, AWS Elemental MediaLive, Amazon CloudFront

Partner use cases

Featured AWS Partners develop solutions and deliver services built on or with AWS Media Services, with multiple options to help you accelerate your move to and adoption of the cloud. Let's look at these AWS Partners in a couple of different use cases:

Broadcast playout

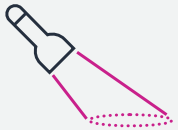
imagine COMMUNICATIONS

AWS Partner Imagine Communications provides media software platforms for linear and nonlinear playout, content supply chain management, next-generation advertising management, targeted delivery, and dynamic ad insertion for the global media and entertainment industry.

Sinclair Broadcast Group is a large television station operator in the US with a total of 193 owned-and-operated stations across the country, in over 100 markets. Sinclair Networks LLC also operates Tennis Channel, as well as the regional sports networks that were acquired from FOX Sports Networks in 2019. Sinclair needed to migrate channel origination of three emerging networks out of an on-premises facility to AWS.

Using solutions from AWS and Imagine Communications, Sinclair has achieved a scalable, secure, and resilient channel origination platform, deployed on AWS. Imagine deployed Versio on AWS while leveraging several AWS services to help manage the TCO.

Learn more about Imagine Communications ›



Solutions spotlight

AWS: Amazon S3, Amazon EC2, Amazon RDS for PostgreSQL, AWS Elemental MediaConvert, and Amazon WorkSpaces

Imagine Communications: Versio Automation, Versio Playout, Versio Workflow, and Versio Content Portal (Asset Management)

Broadcast playout

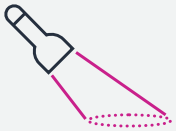
amagi

AWS Partner Amagi brings simplicity, advanced automation, and transparency to the entire broadcast operation, be it for traditional TV or next-gen multiscreen platforms. Amagi has deployments in over 40 countries, enabling TV networks to launch, operate, and monetize channels anywhere in the world.

A+E Networks UK is a leading media network reaching 58 million homes across 100 countries. For A+E Networks UK, Amagi deployed CLOUDPORT, its award-winning cloud platform built on AWS infrastructure to support end-to-end broadcast workflows and managed playout services. Initially set up as a business continuity playout option, the operation was transitioned to be the primary facility in a matter of weeks. More than 50,000 hours of content were ingested into the cloud.

Now A+E Networks UK has greater flexibility and scalability. Multiple geographies are covered with cost-effective cloud playout, and the network can manage broadcast operations remotely. A+E Networks UK has improved operational insights at all stages of the broadcast workflow.

Learn more about Amagi ›



Solutions spotlight

AWS: Amazon S3, AWS Batch, AWS Elemental MediaConnect, AWS Direct Connect, AWS Lambda, Amazon RDS, AWS Identity and Access Management (AWS IAM)

Amagi: Amagi CLOUDPORT

Remote live production

AWS Partner Grabyo is a cloud-based video production platform for editing and distribution. The company started as a live clipping solution but now offers a live production streaming platform as one of its core services. Yet, while its services became more modernized, the company wrestled with inflexible infrastructure and an inability to scale efficiently.

The cloud changed that, enabling Grabyo to establish continuous updates and collaborative workflows, realize flexible pricing, and scale on demand—things Grabyo "did not think were possible just a couple years ago," according to Grabyo CEO, Gareth Capon.

Today Grabyo is thinking about the native cloud as well as future innovation. The company can bring in feeds remotely, add graphics from third parties, and work with teams based anywhere in the world. Also, it only pays for production tools when in use. And it can build and test quickly with agile iteration.

"The most important thing for the production team is a reliable, high-quality experience," said Capon. "In the past, those services were built on hardware. By moving those services to the cloud, we can change the environment in which people work—and ultimately, the cost structure."

AWS Cloud Digital Interface (AWS CDI) allows Grabyo to move uncompressed video in the cloud and increase the flexibility of services it provides. The improvements help Grabyo drive innovation, optimization, and quality—and there are positive environmental and cost impacts, as the company does not need to move people and infrastructure around the world. In turn, Grabyo can reinvest the production savings into new offerings and services.

"We've really just touched the surface of what is possible," said Capon.

Learn more about Grabyo ›

"We've really just touched the surface of what is possible."

Gareth Capon, CEO, Grabyo

AWS Media Services designed for broadcasters

While AWS Media Services are great for OTT video applications, several features are designed specifically for use in broadcasting.

Statmux for AWS Elemental MediaLive

Statistical Multiplexing (Statmux) is a technology that allocates bits in real time among multiple live video channels. It maximizes network efficiency by optimizing picture quality for a group of channels within a fixed total bandwidth.

Statmux for AWS Elemental MediaLive is an alternative to traditional, hardware-based approaches to preparing broadcast video for delivery. By enabling easy-to-use, fully managed cloud services for broadcast video distribution, Statmux for AWS Elemental MediaLive lets you deliver live content more flexibly and efficiently, reduce infrastructure and management costs, and deliver high-quality video with built-in reliability.

With Statmux for AWS Elemental MediaLive, you can implement flexible and scalable workflows in AWS, generating content for distribution to headends via traditional broadcast methods. Combined with the advanced video encoding features and built-in resiliency of AWS Elemental MediaLive, Statmux extracts more bandwidth capacity from the network, ensures reliable 24/7 operations, and reduces total cost of ownership for linear video delivery.

Learn more about Statmux ›

Uncompressed video in the cloud using AWS CDI

AWS Cloud Digital Interface (AWS CDI) is a network technology that allows broadcasters to transport high-quality uncompressed video inside AWS with high reliability and network latency as low as eight milliseconds—less than one frame for 60 frames per second video. AWS CDI allows you to deploy live video solutions across multiple Amazon EC2 instances and AWS Media Services without compromising latency and quality requirements.

Some use cases for distributed, multi-vendor applications built with AWS CDI include TV channel playout, live video production switching, motion graphic insertion, multi-viewer applications, video frame rate and color space conversion, forensic watermarking, and video decoding and encoding. You can choose from an array of products and solutions from third-party vendors and AWS Partners and take advantage of support in AWS Media Services including AWS Elemental MediaLive.

Learn more about AWS CDI ›

Secure and reliable live video transport

Today, broadcasters typically rely on satellite networks or fiber connections to send high-value content into the cloud or to transmit it to others for distribution. These approaches are expensive, require long lead times to set up, and lack the flexibility to adapt to changing requirements. Some broadcasters have tried to use solutions that transmit live video on top of IP infrastructure but have struggled with reliability and security.

With AWS Elemental MediaConnect, you can get the reliability and security of satellite and fiber combined with the flexibility, agility, and economics of IP-based networks. AWS Elemental MediaConnect lets you ingest live video from a remote event site (such as a stadium), share video with a distributor (like a cable TV distributor), or replicate a video stream for processing (like an OTT service).

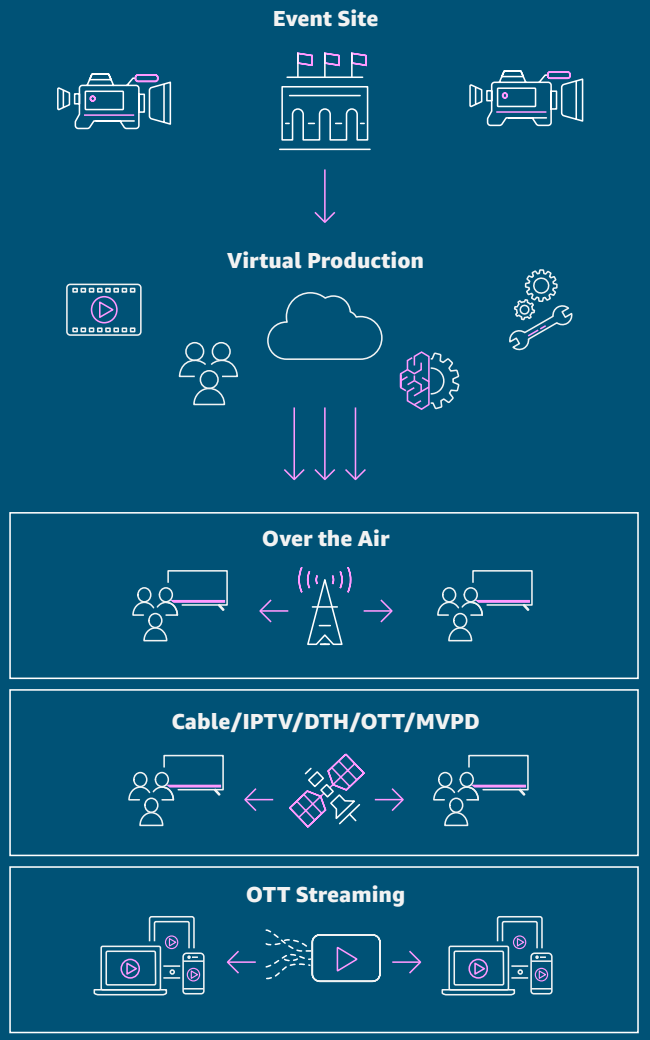
Learn more about AWS Elemental MediaConnect ›

The future of broadcasting is in the cloud

The flexibility made possible by the cloud opens up new opportunities not previously possible with legacy, on-premises infrastructure and processes.

- Because you are not tied to your capex and physical infrastructure, you can seek to use the right tool for the job—rather than rely on what you have on hand. You can decommission data centers and physical playout hubs, helping to optimize your costs. And with this freedom of choice, you can continue to test, cultivate, and explore creativity—which can lead to better content.
- You can also be truly global—both with your workforce as well as your reach to customers. You can augment your team and resources because talent doesn't have to physically be on-site.
- You can scale, iterate quickly, and explore new delivery options such as standing up short-term channels for major events. And you can deliver high-quality video to every screen, including emerging devices, with reliability.
- The net result: By transitioning to an all-virtual broadcast workflow, you can explore and expand your broadcast offerings and become a modern broadcaster.

The all-virtual future (broadcast workflow)



Get started: Modernize broadcasting on AWS

Explore AWS for Broadcast