

AWS Architecture Monthly



June 2020

Media & Entertainment

Notices

Customers are responsible for making their own independent assessment of the information in this document. This document: (a) is for informational purposes only, (b) represents current AWS product offerings and practices, which are subject to change without notice, and (c) does not create any commitments or assurances from AWS and its affiliates, suppliers, or licensors. AWS products or services are provided “as is” without warranties, representations, or conditions of any kind, whether express or implied. The responsibilities and liabilities of AWS to its customers are controlled by AWS agreements, and this document is not part of, nor does it modify, any agreement between AWS and its customers.

© 2020 Amazon Web Services, Inc. or its affiliates. All rights reserved.

Editor's note

AWS makes it fast and easy for the Media and Entertainment (M&E) industry to produce, process, and deliver broadcast and over-the-top video. These pay-as-you-go services and appliance products offer the video infrastructure you need to deliver great viewing experiences to any screen.

Our expert this month, Konstantin Wilms, talks about industry and architectural pattern trends in the cloud-based M&E space, and explains why this industry is unique in that almost any business problem can be solved using many AWS services. He also offers advice on what prospective customers should be thinking about and considering when moving to AWS.

I hope you'll find this edition of Architecture Monthly useful, and my team would like your feedback. Please give us a star rating and your comments on the [Amazon Kindle](https://amzn.to/Kindle-magazine) page (<https://amzn.to/Kindle-magazine>). You can view and download [past issues](https://aws.amazon.com/whitepapers/kindle/) (<https://aws.amazon.com/whitepapers/kindle/>) and reach out to aws-architecture-monthly@amazon.com anytime with your questions and comments.

In June's Media & Entertainment issue:

- **Ask an Expert:** Konstantin Wilms, WW Tech Leader, AWS M&E
- **Blog:** Deploying Your Favorite Post Production Applications on AWS Virtual Desktop Infrastructure
- **Case Study:** L Benfica: Launching a Full-Featured VOD Platform in Just Four Weeks
- **Quick Start:** Cloud Video Editing on AWS
- **Tutorial:** Reimagine Your Studio
- **Whitepaper:** Building Media & Entertainment Predictive Analytics Solutions on AWS

Annik Stahl, Managing Editor

Ask an Expert:

Konstantin Wilms
WW Tech Leader, AWS Media & Entertainment

Note: A list of resources and links appear at the bottom of this section.

What are the general architecture pattern trends for the Media & Entertainment industry?

From an architectural perspective, Media & Entertainment (M&E) in the cloud benefits from having a number of mature and well-tested patterns, primarily due to a commonality of use cases across most M&E workflows. Examples are live and on-demand video delivery or content archive and supply chain migration. Additionally, over the last few years we've seen customers expand their cloud footprints and bring new and innovative media workflows to AWS in areas such broadcast, real-time statistics, machine learning, remote editing, and even virtual production.

Since our customers are in the business of creating, producing, or delivering content, we naturally see many workflows being built around the content in order to optimize processing efficiency. This concept of content having gravity is not an uncommon one in the M&E industry. [Amazon S3 Glacier](#), [Amazon S3 Glacier Deep Archive](#), and [Amazon Simple Storage Service](#) (S3) are key to unlocking this, allowing for fast onboarding of content, cost reduction, and increases in efficiency. Compute also plays a key role in the majority of M&E workflows. There is an ongoing shift towards container-based microservice architectures such as [Amazon Elastic Kubernetes Service](#) (EKS) and [Amazon Elastic Container Service](#) (ECS) for larger and more complex systems. [AWS Lambda](#) and [AWS Step Functions](#)-based workflows apply to smaller and purpose-built systems. [Amazon EC2 Spot](#) is for intensive media processing that requires both low cost and high scale.

Combining native object store along with [AWS Media Services](#), [serverless](#), or microservice-based processing allows customers to quickly iterate through development, and create complex workflows with relatively small engineering teams.

But what about the coupling of these processes and services? In general, M&E architectures all share the concept of a processing pipeline or workflow, be that content being transcoded, processed with machine learning, or delivered as live or on-demand streams. Because many of these content movement patterns are unidirectional or fan-out from a pattern perspective, we see heavy use of event-based data movement using AWS Lambda,

[Amazon Simple Notification Service \(SNS\)](#), [Amazon Simple Queue Service \(SQS\)](#), [Amazon EventBridge](#), and [Amazon CloudWatch](#).

Lastly, and maybe most importantly, customers deploying M&E workloads to the cloud are also looking to simplify and reduce complexity. Managed [AWS Media Services](#) and content delivery via [Amazon CloudFront](#) play an important roles here, as do a wide variety of [Digital Media Partner Solutions](#).

What are some questions customers need to ask themselves before considering AWS for their company?

M&E customers generally fall into two domains:

1. Mature M&E customers with well-established and long-running services moving to the cloud are typically looking to go beyond a lift-and-shift of their workloads.
2. On the other hand, Greenfield customers, are looking to innovate and adopt new technologies.

Both domains share commonality in the need to innovate and differentiate their products in the market. This strategy of deploying workflows and looking to future-proof or enhance them requires a certain level of careful planning and strategic adoption of services.

Customers should ask themselves what their initial operational state needs to look like, as well as if they should simultaneously take the opportunity to modernize their workflows and potentially reduce technical debt in their processing pipelines. Regardless of the path they choose, they should identify key AWS services to use, map out their media processing pipelines with a view for regional and global deployment, decide on a repeatable approach for infrastructure as code and CI/CD pipelines, and understand how to protect and secure their content through all stages of the pipeline, including AWS Managed Services and the shared responsibility model.

When putting together an AWS architecture to solve business problems specifically for a Media & Entertainment company, do you have to think at all differently?

Very much so. Media & Entertainment is unique in that almost any business problem in the space can be solved using many AWS services. This makes it easy to overcomplicate a solution by using a wide variety of AWS Managed Services. Although this approach has merit in many cases (such as potential faster time to market), customers should think about how to simplify their infrastructure stack since this approach brings a number of benefits. These advantages are specifically around infrastructure as code deployment and development time, the ability for a smaller team to ramp up on knowledge, and reduced burden when performing content security audits. Complexity is the foe of efficiency, reliability, throughput, and scalability, and this holds true for all M&E workloads.

Do you see different trends within the industry in cloud versus on-premises?

Definitely. If we view M&E at 10,000 feet, eliminating areas that share commonality or have workflows that can be deployed to the cloud, trends for on-premises workflows are often at very different ends of the media spectrum. This is namely in the initial creation of content and final consumption on consumer devices or distribution locations. Hardware is still a key component to capture and playback, be that consumer or professional, and the challenge really lies in closing these gaps to make a customer's cloud experience and journey as frictionless as possible. Examples here include [AWS Elemental Link](https://aws.amazon.com/medialive/features/link/), which provides pre-configured, managed ingest of live feeds into a customer's account, or [AWS Snowball Edge](https://aws.amazon.com/snowball-edge/) and [AWS Outposts](https://aws.amazon.com/outposts/), which extend hybrid media processing to the customer's edge network.

What's your outlook for AWS in the Media & Entertainment industry, and what role will cloud play in future development efforts?

In the space of less than half a decade we have seen customers shift from services such as direct-to-consumer video-on-demand streaming to embracing new and cutting-edge initiatives around spatial media computing, virtualized sets, camera production ingest, cloud-based broadcast headends, machine learning, and full remote edit in cloud workflows. The cloud is playing a key role in unlocking these workflows, and we will continue to see an evolution of AWS services, enabling customers to iterate faster and plan for the next decade.

Resources mentioned:

- [Amazon S3 Glacier](https://aws.amazon.com/glacier/) (<https://aws.amazon.com/glacier/>)
- [Amazon S3 Glacier Deep Archive](https://aws.amazon.com/glacier/) (<https://aws.amazon.com/glacier/>)
- [Amazon Simple Storage Service \(S3\)](https://aws.amazon.com/s3/) (<https://aws.amazon.com/s3/>)
- [Amazon Elastic Kubernetes Service \(EKS\)](https://aws.amazon.com/eks/) (<https://aws.amazon.com/eks/>)
- [Amazon Elastic Container Service \(ECS\)](https://aws.amazon.com/ecs/) (<https://aws.amazon.com/ecs/>)
- [AWS Lambda](https://aws.amazon.com/lambda/) (<https://aws.amazon.com/lambda/>)
- [AWS Step Functions](https://aws.amazon.com/step-functions/) (<https://aws.amazon.com/step-functions/>)
- [Amazon EC2 Spot](https://aws.amazon.com/ec2/spot/) (<https://aws.amazon.com/ec2/spot/>)
- [Amazon Simple Notification Service \(SNS\)](https://aws.amazon.com/sns/) (<https://aws.amazon.com/sns/>)
- [Amazon Simple Queue Service \(SQS\)](https://aws.amazon.com/sqs/) (<https://aws.amazon.com/sqs/>)
- [Amazon EventBridge](https://aws.amazon.com/eventbridge/) (<https://aws.amazon.com/eventbridge/>)
- [Amazon CloudWatch](https://aws.amazon.com/cloudwatch/) (<https://aws.amazon.com/cloudwatch/>)
- [AWS Media Services](https://aws.amazon.com/media-services/) (<https://aws.amazon.com/media-services/>)
- [Amazon CloudFront](https://aws.amazon.com/cloudfront/) (<https://aws.amazon.com/cloudfront/>)
- [Digital Media Partner Solutions](https://aws.amazon.com/digital-media/partner-solutions/) (<https://aws.amazon.com/digital-media/partner-solutions/>)
- [AWS Managed Services](https://aws.amazon.com/managed-services/) (<https://aws.amazon.com/managed-services/>)
- [AWS Elemental Link](https://aws.amazon.com/medialive/features/link/) (<https://aws.amazon.com/medialive/features/link/>)

- [AWS Snowball Edge](https://aws.amazon.com/snowball/) (<https://aws.amazon.com/snowball/>)
- [AWS Outposts](https://aws.amazon.com/outposts/) (<https://aws.amazon.com/outposts/>),

About our expert



Konstantin Wilms is the Global Tech Lead for M&E at AWS. He has over 25 years of experience in the industry, and has designed & worked on large scale 2D & 3D media processing, digital supply chain, computer vision, content encryption, satellite communication, and broadcast delivery systems. Prior to AWS, he held CTO, SVP, and Chief Architect roles, and ran development teams at a number of media startups and large enterprises including Deluxe and News Digital Systems, and has contributed to ATSC and OASIS standards efforts.

Real-world example

PixelStrings by Cinnafilm: A Flexible & Scalable Platform for Video/Audio Optimization & Conversion

Alfred She from Cinnafilm, Inc. explains how the company uses native AWS services to implement PixelStrings, a flexible and scalable platform for video and audio processing. PixelStrings offers transcoding, high-quality motion-based frame rate conversion, audio and video retiming, deinterlacing, denoising, and re-texturing. Learn how Amazon EC2 (general compute and GPU instances), Amazon S3, and AWS Lambda work together in the PixelStrings video/audio processing PaaS (Platform as a Service). PixelStrings provides a full-stack web application and a JSON-RPC API that customers use to upload, process, and download video and audio assets.

<https://amzn.to/AWS-media-pixelstrings>

Blog:

Deploying Your Favorite Post Production Applications on AWS Virtual Desktop Infrastructure

By Matt Herson, Mario Monello, Mark Stephens, and Sachin Holla

Available online at: <https://amzn.to/AWS-media-virtual-desktop>

Virtualization quickly became a requirement to enable creative professionals to be productive during work from home mandates. This blog entry outlines key considerations when considering running your favorite post-production applications from the AWS cloud.

Customers frequently ask if they can run their editing software in AWS. From these inquiries, it's clear that patterns of use can be described in the form of distinct use cases, or what we call user personas. Some of the most common personas are News/Sports, Creative, and Promo. The goal in identifying personas is to provide enough flexibility around common use cases to allow for easy application against a variety of additional use cases, such as long and short form productions, conformance edits, and manual quality control. Personas have differing demands in terms of storage, network bandwidth, disk I/O, CPU, and memory. Naturally, there are some workflows that are a challenge in the cloud, including color grading, color fidelity, and multi-channel audio support. As Virtual desktop infrastructure (VDI) protocols evolve to support functionality such as 10-bit color and more audio channels, these workflows can be enabled, and AWS has designed its templates with flexibility in mind to accommodate future feature improvements.

Key considerations for creative professionals' cloud-based Workflows

It is important to note that minimizing network latency has a direct impact on workstation interactivity, and that being physically closer to an AWS region provides a better user experience. Additionally, locations such as Los Angeles have dedicated [AWS Local Zones](#), which reduce latency by placing AWS compute, storage, database, and other select services closer to large population, industry, and IT centers. Finally, when operating in a production facility, studio, or creative office, [AWS Direct Connect](#) enhances not only connectivity through dedicated capacity, but also adds a layer of security abstracting the public internet path. When choosing a deployment location or region, a target latency of around 30ms or less will provide an optimal experience. Higher latency may lead to lag in peripheral device

interactivity such as jog/shuttle operations, or general playback and graphical interface activities.

Benefits of AWS

Moving your creative workflows to AWS has a number of benefits, one of which is the ability to scale your setup based on demand, and without a strict plan for capacity. Compute, storage, networking, and other AWS services are all billed pay as you go, and you no longer have to plan for large capital outlay to expand your storage or procure a large number of workstations. Upgrading, patching, and imaging your workstations is also simpler, and can be automated via [AWS System Manager](#). Infrastructure can be centrally located and secured, enabling creative talent to collaborate using a single pool of resources and assets, versus the time-consuming and costly model of transferring content to all users. Additionally, for global, distributed, and follow-the-sun creative operations, AWS now spans 73 Availability Zones within 23 geographic regions around the world, allowing your infrastructure to reside close to your local talent pools. As an example, embracing dynamic infrastructure and AWS technologies enables live events including [World Cup Soccer](#) to use remote talent for highlights and edits. Optimizing creative workflows by taking advantage of these benefits reduces cost, centralizes security and storage requirements, eliminates time-consuming data and personnel movement, and provides a faster time-to-market for creative workflows.

Security

AWS provides fine-grained access to securely control, monitor, and audit access to your workstations and content. Security in AWS is a top priority, and you can find many resources on securing your infrastructure and content through [AWS Artifact](#), a central resource for compliance-related information, available via the AWS Management Console. Artifact provides detailed deployment guides that show you how you build secure, end-to-end production-ready systems in AWS around use cases such as Asset Management and Cloud Rendering. From a more detailed perspective, auditability and traceability are important factors to consider when building a cloud-based edit workflow, and AWS provides a number of services to reduce the security burden of managing virtual edit stations. You can fully audit your infrastructure using services including [AWS CloudTrail](#), [Amazon GuardDuty](#), and [Amazon Simple Storage Service \(Amazon S3\)](#) server access logging to name a few. In addition, [AWS Security Hub](#) provides a comprehensive and aggregated view of your security posture across services. When it comes to high value assets and content, AWS provides encryption at rest and in transit across services including Amazon Elastic Block Store (Amazon EBS) and Amazon S3. You bring your own keys using [AWS Key Management Service \(KMS\)](#) in both customer- and service-managed content encryption and key management models. Last and most importantly, edit station display protocols need to employ an adequate level of security. Teradici's PCoIP display protocol provides FIPS 140-2

level 'always-on' AES256 encryption, keeping the pixels you stream back to your client secure. For an even higher level of security, you can protect your display protocol with a variety of VPN solutions from AWS or partners, including solutions optimized for low latency.

To learn more about security, architecture, and how to get started, read the full blog post online: <https://amzn.to/AWS-media-virtual-desktop>

Real-world example

Replace Your On-Premises VDI with End-User Computing on AWS

In this AWS Online Tech Talk, learn how and why customers are moving to EUC solutions on AWS.

<https://amzn.to/AWS-media-VDI>

Case Study:

SL Benfica:

Launching a Full-Featured VOD Platform in Just Four Weeks

Brandon Zupanci introduces this case study with his blog post, **Launching a Full-Featured VOD Platform in Just Four Weeks**: <https://amzn.to/AWS-media-VOD-in-4-weeks>

Case study is available online at: <https://amzn.to/AWS-media-case-study>

Executive summary

The reigning champions of the Portuguese League (Primeira League), [SLBenfica](#) have become the first football club in the country with its own digital videoplatform. Launched at the Sport Lisboa e Benfica Stadium in Lisbon in January 2020, [Benfica Play](#) (<https://www.benficaplay.pt/>) features exclusive content produced daily for club supporters. With a large and loyal global fan base, it was vital that Benfica quickly roll out its video service and handle large peaks in viewer numbers.

Increasing fan engagement

SLBenfica wanted to increase engagement with its global fan base while giving viewers access to exclusive, never-seen-before content. When the football club decided to launch a Video-on-Demand service, it was keen to roll out a fully customized service with the club's own look and feel within just a few weeks. This unique service would offer a range of exclusive interviews and behind-the-scenes footage from both matches and training sessions. SL Benfica would also include scheduled "live" streams curated from pre-recorded videos to generate the same excitement and experience as match day. With fans eagerly counting down the days to the premiere of an exclusive video, the video service needed to scale to handle large traffic spikes.

Building a streaming service

With only a few weeks to launch the service, SLBenfica turned to [Insys Video Technologies](#), a fast-developing video integration company specializing in the delivery of comprehensive implementation of over-the-top (OTT) projects. Insys is an AWS Select Consulting Partner with AWS certified architects and developers. Insys was a top choice because of its experience implementing online video projects, along with its ability to quickly deploy fully customized video platforms. SLBenfica wanted a vendor that could provide local support and quickly adapt to rapidly changing requirements throughout the project. Insys sent a

dedicated project manager and an experienced architect to Lisbon to oversee the implementation from start to finish. With the architect onsite, Insys was able to drive the project with the flexibility needed to launch Benfica Play in just a few weeks. Since SL Benfica already produces content for its own linear television channel, it had a ready-made team of cameraman and journalists able to create exclusive content for the VOD service.

Cloud-based sports solution

Benfica Play is powered by InsysSport, a white-label streaming video solution designed for sports clubs, leagues, federations, and associations, as well as broadcasters with sports transmissions rights. Insys Sport makes it easy to rapidly launch sports streaming services that significantly improve fan engagement and open up monetization opportunities.

Insys Sport is a cloud-based solution that operates within a scalable AWS cloud environment, allowing for high peaks in traffic to provide a scalable, resilient fan experience. Content is stored in [Amazon Simple Storage Service](#) (Amazon S3), an object storage service that offers industry-leading scalability, data availability, security, and performance. Insys Sport uses [Amazon CloudFront](#), a content delivery network (CDN) service that securely delivers video to customers with low latency and high transfer speeds. Transcoding for VOD delivery is handled by [AWS Elemental MediaConvert](#), which allows SLBenfica to easily create video-on-demand (VOD) content for broadcast and multiscreen delivery at scale. Insys Sport features API integration with [AWS Elemental MediaLive](#), a broadcast-grade live video processing service, and [AWS Elemental MediaPackage](#), which creates video streams formatted to play on connected TVs, mobile phones, computers, tablets, and game consoles.

With a strong focus on keeping fans engaged and protecting its valuable content, security was a critical factor for SLBenfica. The content is fully protected using Insys Multi DRM. Furthermore, the service is equipped with [AWS Shield](#), a managed Distributed Denial of Service (DDoS) protection service that safeguards applications running on AWS.

Full implementation in four weeks

Within just four weeks from the start of the project, SL Benfica was able to delight fans and the media with the launch of Benfica Play at the Sport Lisboa e Benfica Stadium in Lisbon.

Benfica Play is now available to fans across the globe, giving them daily access to new and exclusive video content and bringing them closer to their club and sporting idols than ever before. The VOD service gives club members a discount on their monthly subscription as well as access to additional content.

Insys Video Technologies and SLBenfica will continue to work together to maintain, develop, and update the Benfica Play VoD service to ensure it continues to delight fans in years to come.

Real-world example

ViacomCBS: Multiplatform Distribution Powered by AWS

ViacomCBS's Multiplatform Distribution uses AWS services and partners as its media supply chain to process, orchestrate, and deliver media for linear and video-on-demand (VoD) distribution platforms. The system uses AWS to safely ingest media as well as categorize and collate various metadata formats into a single standard to (1) allow a single company-wide metadata schema upstream for all downstream product/platforms and distribution; (2) improve the use and accuracy of AI and personnel-assisted de-duplication of archive assets stored in a data lake containing in excess of 40+ PB; and (3) package media and metadata for long-term storage and archiving in the cloud.

<https://amzn.to/AWS-media-TMA-VOD>

Quick Start:

Cloud Video Editing on AWS

Available online at: <https://amzn.to/aws-media-cloud-video-editing>

Source code on GitHub: <https://fwd.aws/68eJr>

This Quick Start deploys a highly available architecture for cloud video editing on the Amazon Web Services (AWS) Cloud.

The deployment uses Amazon Simple Storage Service (Amazon S3), Amazon Elastic Compute Cloud (Amazon EC2), Amazon Virtual Private Cloud (Amazon VPC), AWS Directory Service, and Remote Desktop Gateway (RD Gateway) instances.

This reference architecture is automated by AWS CloudFormation templates that deploy the environment on AWS in about 30 minutes. You can customize the templates to meet your specific requirements.

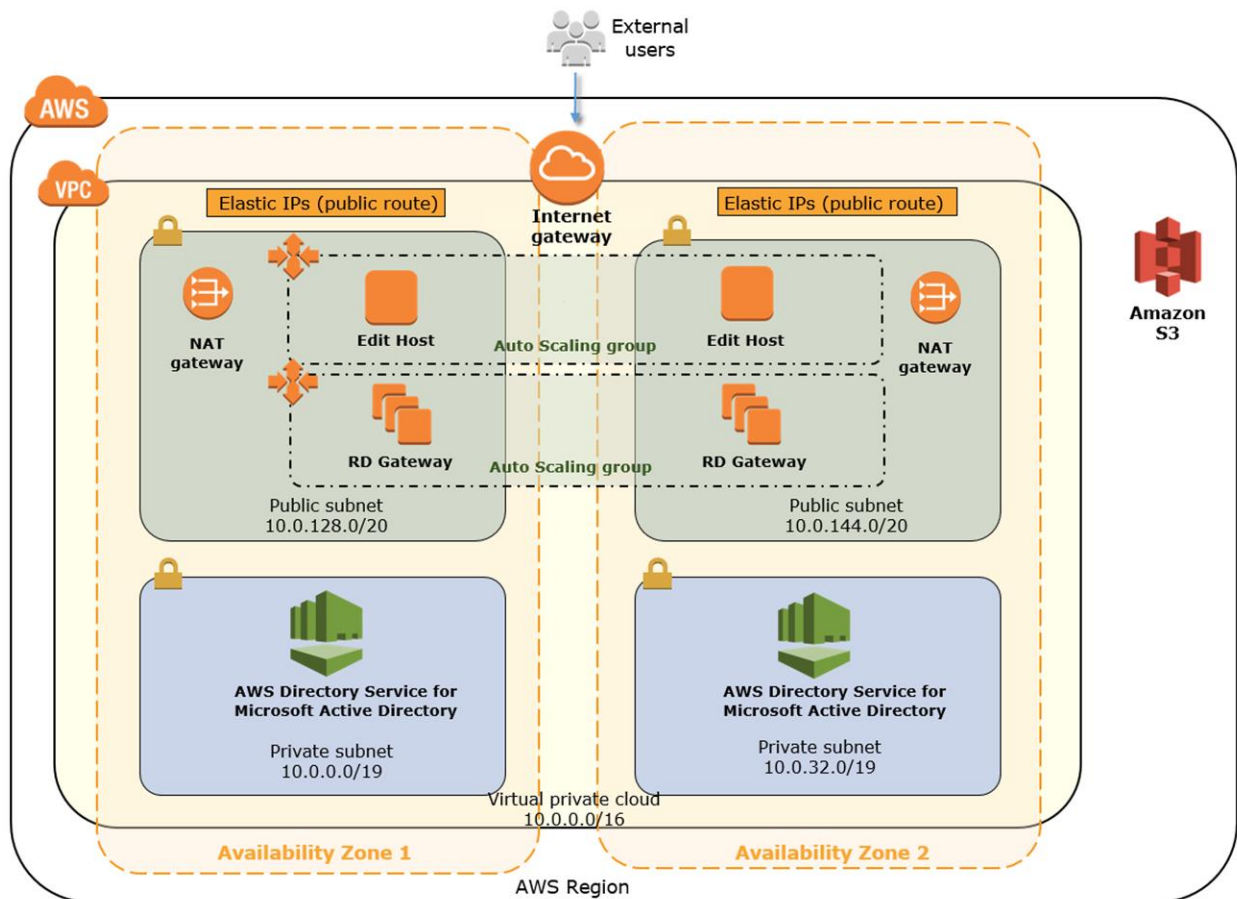
What you'll build

This Quick Start architecture includes the following infrastructure:

- A virtual private cloud (VPC) that is configured across two Availability Zones. For each Availability Zone, this Quick Start provisions one public subnet and one private subnet, according to AWS best practices.
- In the public subnets, Edit Host instances and Remote Desktop Gateway (RD Gateway) instances in an Auto Scaling group for secure access to EC2 instances in the private subnets.
- In the public subnets, managed network address translation (NAT) gateways to provide outbound internet connectivity for instances in the private subnets.
- An AWS Identity and Access Management (IAM) role to enable AWS resources created through the Quick Start to access other AWS resources when required.

The Quick Start gives you the option to build a new VPC infrastructure with these components or to use your existing VPC infrastructure. Within this infrastructure, the Quick Start deploys:

- In the private subnets, AWS Directory Service for Microsoft Active Directory, which provides most of the features that Microsoft Active Directory offers, plus integration with AWS applications.
- An Amazon Elastic Compute Cloud (Amazon EC2) G3 instance, which offers a powerful, low-cost, pay-as-you go model for high-end workstations.
- Amazon Simple Storage Service (Amazon S3), which is an object store that provides artifacts necessary for the Quick Start. You can also use it to upload video for editing on the G3 instance.



Read online at: <https://amzn.to/aws-media-cloud-video-editing>

Source code on GitHub: <https://fwd.aws/68eJr>

Real-world example

Deluxe One: Unifying Modern Content Creation and Delivery at Scale

From pitch to playout, Deluxe One brings together services that power the film and television industry, making it possible for creators to manage all content in one place.

Behind Deluxe One, is a constellation of AWS-powered micro-services that enable blockbuster films to be produced and distributed globally. In this session, we'll examine the overall architectural approach to Deluxe One and highlight key service implementations, like cloud editing, content archive, and over-the-top streaming. If you're interested in finding out more information about Deluxe or its Deluxe One platform, please visit

<http://www.bydeluxe.com>

<https://amzn.to/AWS-media-cloud-editing>

Tutorial

Reimagine Your Studio

Free tutorial available online at: <https://amzn.to/AWS-media-reimagine-studio-tutorial>

AWS and NVIDIA have partnered to bring your studio a powerful and advanced GPU-accelerated solution for cloud-based virtual workstations.

When you move to virtual workstations on AWS, you'll benefit from the latest technology, performance you expect, and an almost unlimited capacity for creativity. Here's what you need to know to get started.

Implementing virtual workstations on AWS

Amazon EC2 G4 instances deliver high-performance GPUs for deploying graphics-intensive applications.

G4 instances are powered by the latest generation of NVIDIA T4 Tensor Core GPUs – with Quadro Virtual Workstation software at no additional cost, up to 100 Gbps of networking throughput, and up to 1.8 TB of local NVMe storage. NVIDIA T4 GPUs include RT Cores to accelerate ray tracing and new Tensor Cores for AI inference, making real-time ray tracing possible.

Here's how it works:

G4 instances are offered in different sizes, with your choice of one GPU or multiple GPUs, and varying amounts of vCPU and memory, giving you the flexibility to pick the right instance size for your applications.

About the tutorial

Welcome to this tutorial about setting up a streaming virtual workstation. This step-by-step tutorial is written for creative studios interested in learning how to stream a powerful graphics workstation from the cloud. It has been created by artists including animators and composers, so its approach will resonate with an audience less familiar with cloud technology and using the AWS console. By the end of the tutorial, you'll have a fully cloud-based Linux workstation with Blender installed that demonstrates the power of creating content in the cloud.

View the full, free tutorial: <https://amzn.to/AWS-media-reimagine-studio-tutorial>

Real-world example

Going Remote: Running VFX Virtual Workstations

Learn how AWS, along with partners Teradici and Sohonet, enables a virtual workstation environment for VFX content creation. Using AWS G3 instances, this PCoIP solution for creative professionals delivers a pixel perfect, color accurate, fully interactive native desktop experience for both Windows and Linux platforms. This is ideal for visual effects artists who also require various input peripherals such as latest generation Wacom 8K pressure sensitive tablets and Wacom Cintiq monitors to work as seamlessly as they do on-premises.

<https://amzn.to/AWS-media-virtual-workstations>



Whitepaper:

Building Media & Entertainment Predictive Analytics Solutions on AWS

Read the full whitepaper online at: <https://amzn.to/aws-media-predictive-analytics>

Abstract

This whitepaper is intended for data scientists, data architects, and data engineers who want to design and build Media and Entertainment (M&E) predictive analytics solutions on AWS. Specifically, this paper provides an introduction to common cloud-enabled M&E workloads, and describes how a predictive analytics workload fits into the overall M&E workflows in the cloud. The paper provides an overview of the main phases for the predictive analytics business process, as well as an overview of common M&E predictive analytics use cases. Then, the paper describes the technical reference architecture and tool options for implementing predictive analytics solutions on AWS.

Introduction

The world of Media and Entertainment (M&E) has shifted from treating customers as mass audiences to forming connections with individuals. This progression was enabled by unlocking insights from data generated through new distribution platforms and web and social networks. M&E companies are aggressively moving from a traditional, mass-broadcasting business model to an Over-The-Top (OTT) model where relevant data can be gathered. In this new model, they are embracing the challenge of acquiring, enriching, and retaining customers through big data and predictive analytics solutions.

As cloud technology adoption becomes mainstream, M&E companies are moving many analytics workloads to AWS to achieve agility, scale, lower cost, rapid innovation, and operational efficiency. As these companies start their journey to the cloud, they have questions about common M&E use cases and how to design, build, and operate these solutions. AWS provides many services in the data and analytics space that are well suited for all M&E analytics workloads, including traditional BI reporting, real-time analytics, and predictive analytics.

In this paper, we discuss the approach to architecture and tools. We'll cover design, build, and operate aspects of predictive analytics in subsequent papers.

Overview of AWS-enabled M&E workloads

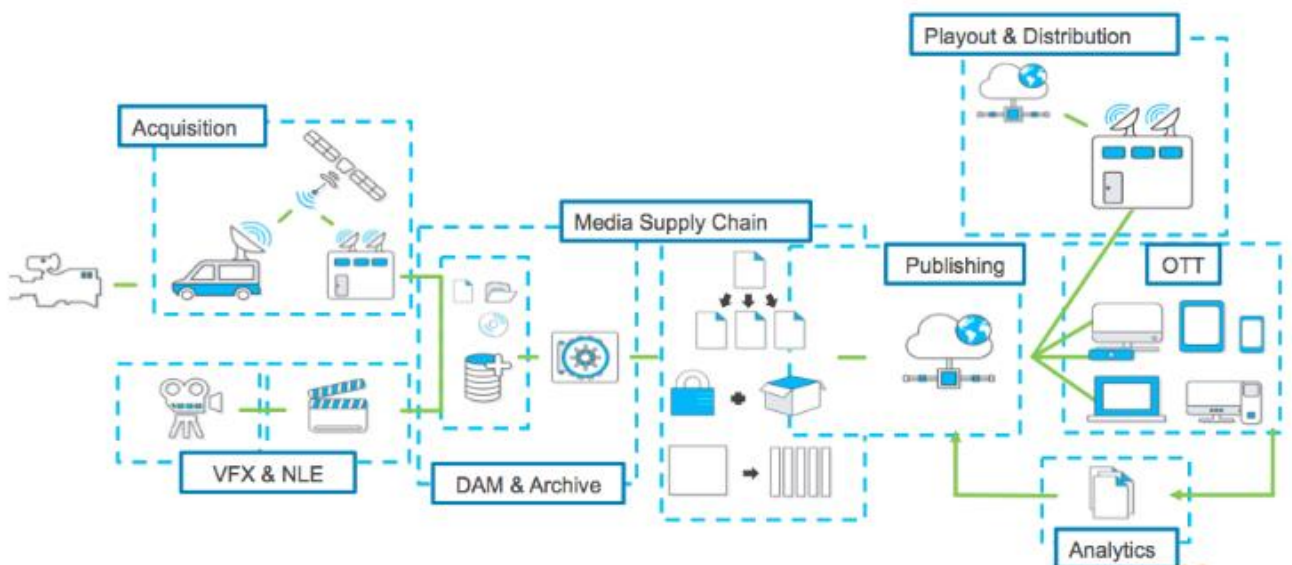
M&E content producers have traditionally relied heavily on systems located on-premises for production and post-production workloads. Content producers are increasingly looking into the AWS Cloud to run workloads. This is due to the huge increase in the volume of content from new business models, such as on-demand and other online delivery, as well as new content formats such as 4k and high dynamic range (HDR).

M&E customers deliver live, linear, on-demand, and OTT content with the AWS Cloud. AWS services also enable media partners to build solutions across M&E lines of business.

Examples include:

- Managing digital assets
- Publishing digital content
- Automating media supply chains
- Broadcast master control and play out
- Streamlining content distribution to licensees
- Affiliates(business to business -B2B)
- Direct to consumer (business to consumer -B2C) channels
- Solutions for content and customer analytics using real-time data and machine learning

Typical M&E workflow



Acquisition. Workloads that capture and ingest media contents such as videos, audio, and images into AWS.

VFX & NLE. Visual Effects (VFX) and nonlinear editing system (NLE) workloads that allow editing of images for visual effects or nondestructive editing of video and audio source files.

DAM & Archive. Digital asset management (DAM) and archive solutions for the management of media assets.

Media Supply Chain. Workloads that manage the process to deliver digital assets such as video or music from the point of origin to the destination.

Publishing. Solutions for media contents publishing.

OTT. Systems that allow the delivery of audio content and video content over the Internet.

Playout & Distribution. Systems that support the transmission of media contents and channels into the broadcast network.

Analytics. Solutions that provide business intelligence and predictive analytics capabilities on M&E data. Some typical domain questions to be answered by the analytics solutions are: How do I segment my customers for email campaign? What videos should I be promoting at the top of audiences OTT/VOD watchlists? Who is at risk of cancelling a subscription? What ads can I target mid-roll to maximize audience engagement? What is the aggregate trending sentiment regarding titles, brands, properties, and talents across social media and where is it headed?

Read the full whitepaper: <https://amzn.to/aws-media-predictive-analytics>

Real-world example

Amazon Prime Video: Advertising Analytics at Scale for Live Events

Prime video shows how they provide customized advertising at scale, and provides reporting/analytics on ad delivery. You'll learn how Amazon Prime Video handles advertising for Thursday Night Football and other live events, providing analytics on ad delivery using AWS Elemental MediaTailor, AWS Lambda, Amazon Kinesis Data Streams, ALB, Amazon S3, and Amazon Athena.

<https://amzn.to/AWS-media-TMA-Prime-analytics>