

**A + E Network** 

## **Cloud Adoption Strategy Plan**

**01 – May - 2024**

## Executive Summary

### Objectives & Outcomes:

The primary objective of the cloud adoption strategy is to transition the existing cloud infrastructure of A+E Networks' AdSales web applications to a modern & more efficient serverless cloud-based environment. This move is driven by the need to reduce operational costs, enhance scalability and improve disaster recovery capabilities.

The expected outcomes include:

- A reduction in cloud infrastructure costs within the first-year post-migration.
- Increased resource utilization.
- Enhanced scalability to handle traffic spikes and ensure continuous service availability.
- Improved operational efficiency through automation and cloud-native technologies.

### Workloads/Processes:

- **DNS and Traffic Management:**

Continue utilizing AWS Route53 [14] for DNS management while integrating with the new CloudFront distribution to ensure efficient routing of user requests to the nearest edge location, improving load times and user experience.

- **Web Application Firewall (WAF) Integration:**

Implement AWS WAF [13] with CloudFront to protect against common web exploits that could affect application availability, compromise security or consume excessive resources.

- **Serverless Compute with AWS Lambda:**

Implement AWS Lambda [9] for running the backend processes previously handled by EC2 instances [6]. This includes processing incoming requests, interacting with databases and handling business logic all in a serverless environment.

- **Storage Optimization with Amazon S3:**

Migrate all static content and operational data from EC2-based storage to Amazon S3 [7] to enhance data durability, availability and scalability.

- **Email Handling via Amazon SES and S3:**

Transition email storage to Amazon S3, while continuing to use Amazon Simple Email Service (SES) [5] for email sending capabilities leveraging S3 for logs and historical data storage.

- **Monitoring and Logging with AWS CloudWatch:**

Utilize AWS CloudWatch [11] extensively for monitoring the performance of serverless functions, logging and maintaining operational health across all cloud services.

- **Frontend Hosting with AWS CloudFront:**

Deploy the web application frontend on AWS CloudFront [15] to distribute content globally and reduce latency, backed by Amazon S3 for static web hosting.

- **Load Balancing to Serverless:**

Utilize the Application Load Balancer (ALB) [12] with direct invocations of AWS Lambda which will handle the request routing based on the incoming API calls instead of the traditional server-based model.

### Business Priorities:

- **Short-term Goals** (0-6 months): Initiate the cloud migration with non-critical environments such as development, Debug and QA to minimize risk and allow for iterative testing and refinement.
- **Medium-term Goals** (6-12 months): Extend the migration to all production environments, implementing robust disaster recovery solutions and auto-scaling capabilities to support

dynamic AdSales operations.

- **Long-term Goals** (1-2 years): Achieve full operational efficiency and cloud cost optimization, with continuous improvements post-migration.

### Timeline & Milestones:

- **Q2 2024:** Finalize cloud provider agreements and start migrating development, debug and QA environments.
- **Q3 2024:** Begin migrating staging areas and initial production environments.
- **Q4 2024:** Finish migrating all environments to the new cloud architecture and initiate testing and optimization.
- **Q1 2025:** Fully transition to new cloud solution and decommission old infrastructure.

## 1. Overview

A+E Networks [20] is dedicated to creating, broadcasting and distributing high-quality media content that informs, entertains, and inspires audiences across the globe. The organization's vision is to be a leader in media and entertainment by fostering creativity, embracing innovation, and delivering exceptional value to viewers, partners, and employees.

Established in 1983, A+E Networks has become a prominent global media and entertainment brand, reaching millions of households and digital users worldwide. The company's portfolio includes influential cultural brands like A&E, The History Channel, Lifetime, LMN, FYI and Vice TV among others. These channels cover a wide array of genres appealing to a diverse audience base.

The primary business areas for A+E Networks include content production, digital media, international content distribution, and advertising sales. With a robust portfolio of channels, the company offers an array of programs ranging from documentaries and reality shows to scripted dramas and movies. The AdSales department plays a critical role, offering advertising opportunities during program breaks, catering to regional, national and international clients.

To enhance the efficiency and effectiveness of advertising sales operations, the AdSales department at A+E Networks employs a suite of specialized internal web applications. These applications are specifically designed to facilitate a seamless workflow from the initial booking of advertisement slots to the final billing and reporting stages. By integrating advanced data analytics and customer relationship management tools, these platforms enable the AdSales team to tailor advertising solutions to the unique needs of each advertiser, ensuring optimal placement and performance. Furthermore, the applications provide real-time monitoring and analytics, allowing for immediate adjustments based on viewer engagement and performance metrics.

### Cloud Adoption Team Overview:

**Business Unit:** Media East

**Business Outcome Owner:**

Phani Aravind – Senior Cloud Architect  
Ravi Kumar Varikunta – Business Leadership

**Cloud Strategy Team:**

**Team Structure and Responsibilities:**

**Sai Aparanji Nemmani:** Oversees the cloud adoption strategy, ensuring alignment with the organization's overall business objectives and technological direction.

**Sushma Shivani Nukala:** Focuses on cloud architecture and design ensuring that the cloud solutions are scalable, reliable and secure.

**Shutonu Mitra:** Evaluates the operational facets of various cloud technologies to guarantee that the chosen solution supports effective deployment and ongoing management of cloud services and infrastructure.

**Haritha Injam:** Dedicates expertise to compare the architecture and design of various cloud solutions, to propose a scalable and reliable cloud infrastructure ensuring that all cloud deployments comply with industry standards and organizational policies.

### **Function and Contact Information:**

The Cloud Adoption Team is integral to transitioning A+E Networks' current cloud infrastructure to the cloud-native solution, optimizing operations and enhancing flexibility and scalability. The team collaborates closely with various departments especially the AdSales department to ensure that internal web applications for AdSales processing and management are effectively migrated and managed in the cloud. This initiative not only aims to improve efficiency and reduce costs but also to foster innovation and agility within the organization. For further details or inquiries, stakeholders can reach out to the Cloud Strategy Team members via their organizational email addresses.

## **2. Define Strategy**

### **Motivations and drivers**

A+E Networks is embarking on a strategic shift towards modern cloud computing to improve the cloud infrastructure of its internal web applications such as Bridge, COPI and to enhance operational efficiency, agility and scalability across its global operations. This transition aims to reduce operational and infrastructure costs, improve disaster recovery and leverage automation alongside cloud-native technologies for superior performance and innovation. By moving to more scalable and efficient cloud-native solutions, A+E Networks seeks to stay competitive in the media landscape, rapidly deploying new services and adapting to evolving market demands.

The decision to adopt the cloud is propelled by several critical business events, including the necessity to optimize AdSales processing, manage growing data volumes efficiently and ensure high availability and disaster recovery for critical applications.

These events underscore the need for a more flexible, scalable and cost-effective infrastructure.

The specific motivations [1] include achieving 100% business continuity, reducing Total Cost of Ownership (TCO), enabling Zero-Touch deployments, enhancing business agility and customer experience through digital technologies. The cloud presents an opportunity to streamline operations, introduce innovative services more quickly and offer a more reliable and engaging user experience across digital platforms.

For a high priority task of infrastructure migration, it helps to describe the current on-premise infrastructure to some detail

## Business outcomes

### *High Priority*

Stakeholder:	Organization and Advertisers	Outcome:	Reduce cloud infrastructure costs and improve resource efficiency
Business Drivers	KPI	Capabilities	
Resource Management and Enhanced Efficiency in cloud infrastructure	Reduce current cloud infrastructure costs by 90% within the first year post-migration; achieve 25% better resource utilization.	Implement cost-optimized cloud services; enable detailed resource monitoring and cost management practices.	

### *Mid Priority*

Stakeholder:	Engineering and Operations Teams	Outcome:	Enhance scalability and fault tolerance of web applications to support dynamic AdSales and uninterrupted broadcasting services.
Business Drivers	KPI	Capabilities	
Auto-Scaling Implementation, High-Availability Systems	Achieve auto-scaling capabilities to handle up to 75% increase in traffic during peak hours; reduce Recovery Time Objective (RTO) to under 30 minutes for all critical applications.	Implement robust auto-scaling and load-balancing solutions; establish a multi-region, high-availability architecture; enforce strict disaster recovery protocols with regular drills.	

### *Low Priority*

Stakeholder:	A+E Networks AdSales department	Outcome:	Enhance reliability and reach of the AdSales applications
Business Drivers	KPI	Capabilities	
Content Delivery Optimization, Network Efficiency	Ensure near zero downtime and reduce content delivery latency by 30%.	Implement a resilient cloud infrastructure; use content delivery networks to improve global reach and performance.	

## Business and cost justification

Success will be gauged by meeting or exceeding key performance indicators (KPIs) such as diminished infrastructure expenses, enhanced operational efficiency, and higher customer satisfaction levels. Additional success metrics encompass more streamlined organizational processes, increased productivity within the IT department, improved contentment among stakeholders and greater organizational nimbleness to adapt to market shifts.

We also aim to enhance performance by actively working to reduce latency and bolster reliability through the global distribution of content. By pursuing these actions, we will be able to establish a more predictable and reduced cost structure, allowing for enhanced budgeting and strategic resource allocation.

## The adoption project idea

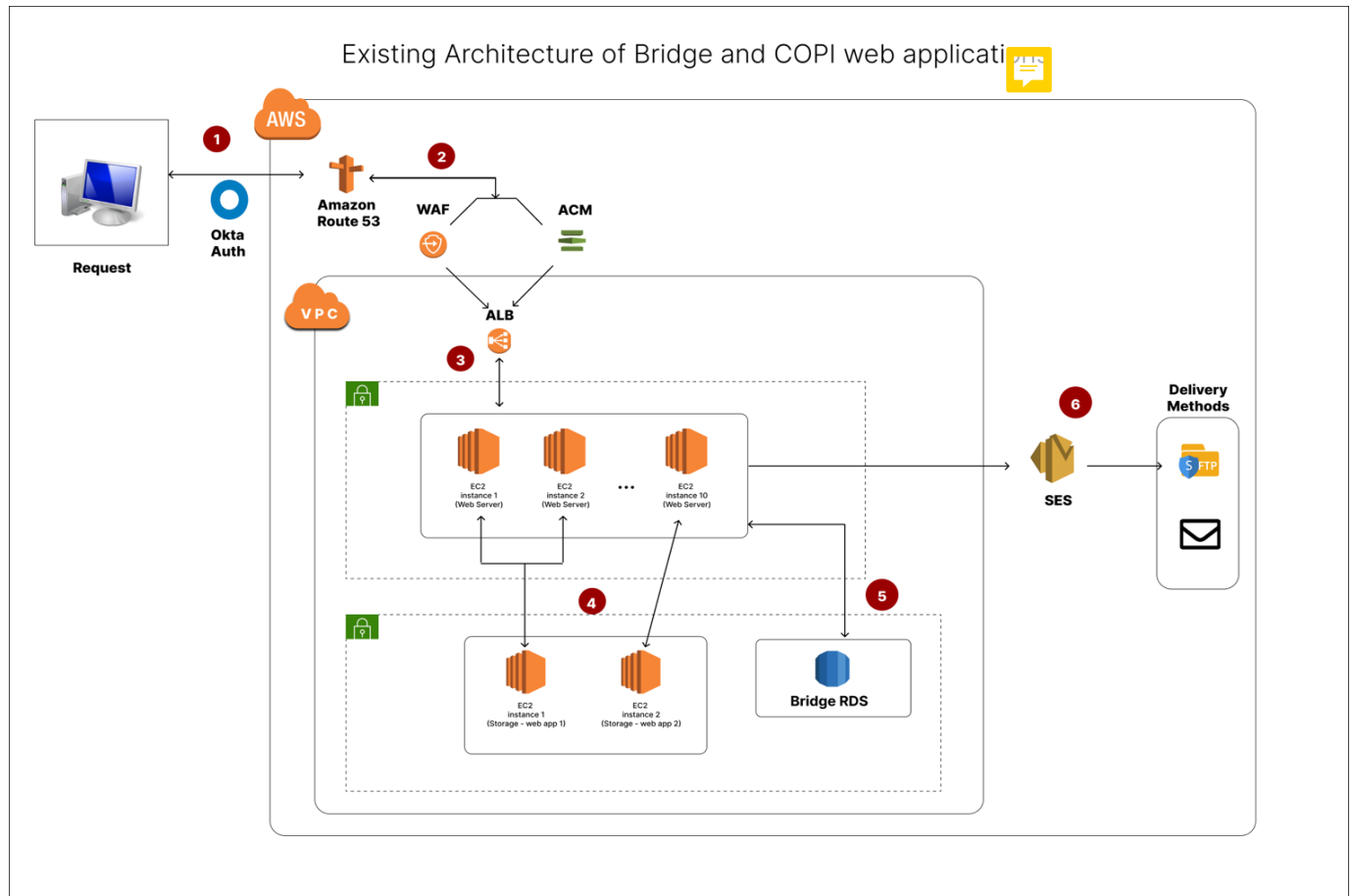
Project:	Improvisation of Cloud Infrastructure of AdSales Web Applications	Outcome:	Enhanced performance, scalability and reduced cloud infrastructure costs
Stakeholder:	AdSales Department	Business Unit:	Media East

## Key stakeholders

Name	Business Unit/Role	Business Outcome Owner (Y/N)	Cloud Strategy Team (Y/N)
Ravi Kumar Varikunta	Business Leadership	Y	N
Phani Aravind	Senior Cloud Architect	Y	N
Sai Aparanji Nemmani	Cloud Strategy Team Lead	N	Y
Sushma Shivani Nukala	Cloud Strategy Team Member	N	Y
Shutonu Mitra	Cloud Strategy Team Member	N	Y
Haritha Injam	Cloud Strategy Team Member	N	Y

### 3. Plan

#### Current Architecture:



The existing architecture employs Okta for user authentication, leveraging Amazon Route 53 for DNS management. It utilizes the AWS Application Load Balancer (ALB) to route requests to the appropriate EC2 instances in the VPC [10] ensuring efficient traffic management. For security, the architecture deploys AWS WAF to protect against common web exploits and AWS Certificate Manager (ACM) is used for managing SSL/TLS certificates. The system hosts its web applications across multiple EC2 instances and uses additional EC2 instances for storage. For database services, Amazon RDS [8] is utilized to ensure reliable data management and storage. Additionally, Amazon SES is implemented for email services supporting delivery methods such as SFTP and email.

#### Digital estate:

For evaluating the current technology assets of A+E Networks as we prepare for cloud adoption, We adopted the **Workload-driven** approach [3]. This strategic choice focuses on the specific needs and characteristics of each application and workload aligning with the company's priority on optimizing and modernizing critical business applications.

In the workload-driven approach, each application and workload within A+E Networks is evaluated based on its operational characteristics, security requirements, financial impact and technical architecture. This begins with a comprehensive assessment of security features, including data categorization, compliance needs and associated risks ensuring that all applications meet stringent



security and regulatory standards when migrated to the cloud. This approach also explores the architectural complexity of each workload, taking into account factors like authentication methods, data structure, latency requirements and interdependencies with other applications.

Operational and financial evaluations are conducted next. This includes analyzing service levels, integration requirements, maintenance schedules and the existing monitoring frameworks. Financially, the analysis focuses on the total cost of ownership (TCO), return on investment (ROI) and operational efficiencies that cloud migration might bring. Seasonality, user types, scalability needs and business continuity plans are also scrutinized to ensure that each workload is not only technically ready but also aligns with business objectives to support growth and scalability.

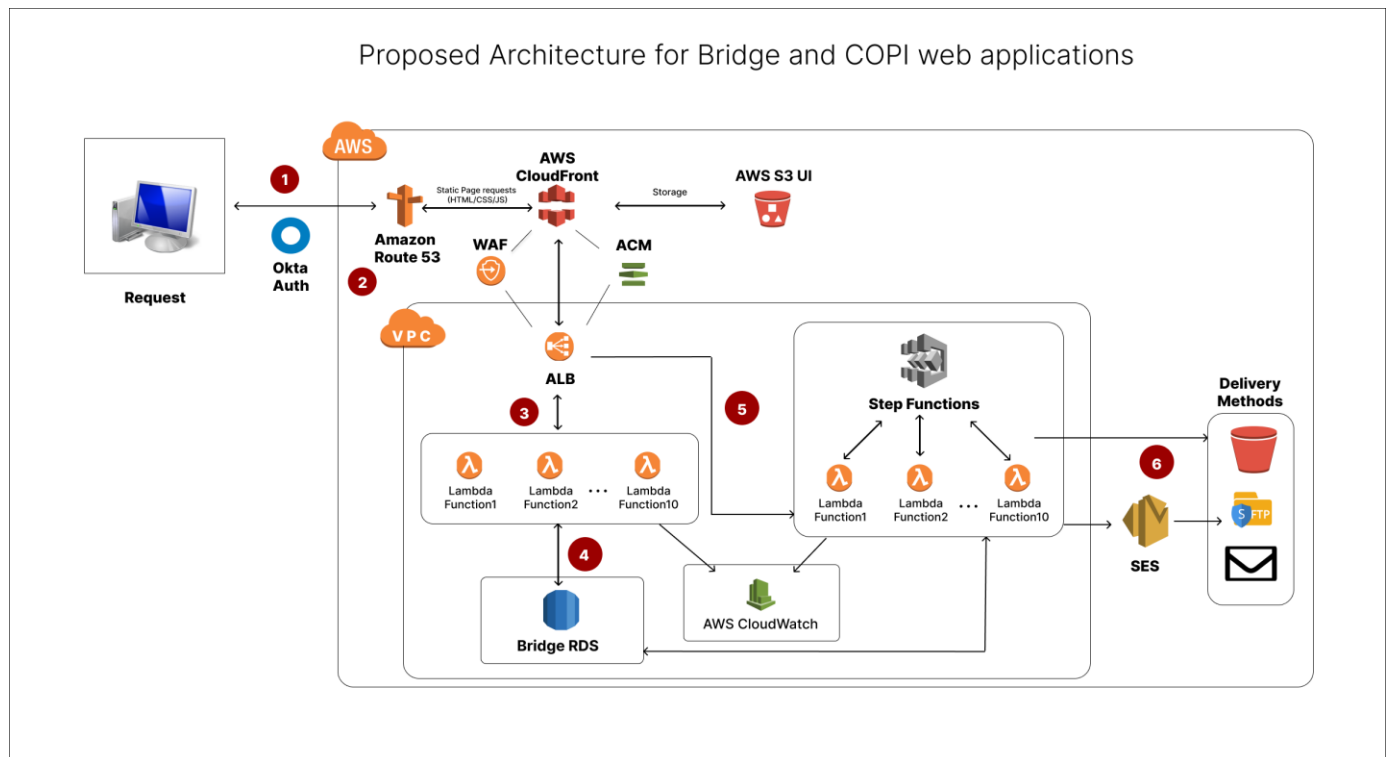
This approach is thorough and holistic, focusing on high-level, strategic assessments that guide decision-making. It's designed to handle the complexity of a diverse application landscape making it well-suited for a media powerhouse like A+E Networks that operates with a wide array of critical workloads. This method will provide a detailed and structured pathway for cloud migration ensuring that each step is aligned with both technical realities and business strategies.

Application/Workload	Business Unit	Business Priority (high, mid, low)	Proposed Rationalization
Serverless migration of Bridge and COPI Web Application Deployment	Ad Sales	High	Transition from EC2 to serverless architecture using AWS Lambda for backend processes, improving cost efficiency, reducing the complexity of deployments, enhancing scalability, and reducing operational overhead
DNS and Traffic Management	IT Operation	High	Maintain AWS Route53 for DNS management and integrate with CloudFront to improve global content delivery and user experience.
Web Application Firewall	Security	High	Upgrade integration with AWS WAF and CloudFront to strengthen security measures against web exploits.
Static Content Storage	All Business Units	Mid	Migrate from EC2-based storage to Amazon S3 to ensure higher durability and availability of content.
Operational Data Storage	All Business Units	Mid	Move operational data to Amazon S3 to leverage its scalability and enhanced data management features.

*Innovation targets: opportunities to improve our customer experience, opportunities to innovate.*

Application/Workload	Business Unit	Business Priority (high, mid, low)	Proposed Rationalization
Email Services	IT Operations	Mid	Migrate storage to Amazon S3 for better data management and retrieval and utilize Amazon SES for sending capabilities.
Monitoring and Logging	IT Operations	High	Use AWS CloudWatch for comprehensive monitoring and logging to maintain and improve system performance.
Frontend Hosting	All Business Units	High	Deploy on AWS CloudFront backed by S3, reducing latency and improving access speeds for global users.

### Proposed Architecture:



The proposed architecture introduces several enhancements to optimize performance and efficiency. Frontend Optimization is achieved through the integration of AWS CloudFront which significantly reduces latency and accelerates the delivery of static content, thereby improving user experience. In a move towards Serverless Computing, the architecture transitions from EC2-based computing to AWS Lambda functions. This shift allows for automatic scaling and reduced operational overhead streamlining the deployment of application logic. Orchestration and Automation are enhanced with AWS Step Functions which coordinate multiple Lambda functions to manage complex workflows seamlessly. Monitoring of the operational health and performance of these serverless components is handled by AWS CloudWatch ensuring robust oversight. Storage solutions are upgraded by replacing traditional

EC2 instance storage with Amazon S3 providing scalable, durable and secure object storage. Additionally, the architecture maintains the use of essential services such as Amazon RDS for database management, AWS SES for email services and continues to utilize AWS Route 53, WAF and ACM preserving their roles similar to the existing setup thereby ensuring continuity and reliability in service delivery.

### Skills readiness plans:

For successful cloud adoption, it's critical to ensure the people, IT and non-IT are ready for this transformation. Including in the table below, the key courses your organization needs to take for this process.

Course name	Audience (Cloud Architect, IT, Admin, Ops)	Level (100, 200, 300, 400)	Source (MS Learn, Pluralsight, AWS)	Priority (high, mid, low)
Cloud Infrastructure Management	Admin, Devs, Cloud Architect, Business User	200	AWS Training	High
Advanced Security on AWS	Cloud Architect, IT Security Ops	300	AWS Training	High
Efficient Cloud Migration Strategies	Cloud Engineer, Devs	200	Pluralsight	Mid

### Cloud Adoption Plan

#### Cloud Service Provider:

A+E Networks has selected **Amazon Web Services (AWS)** as the cloud service provider due to its comprehensive suite of scalable cloud solutions and its alignment with our existing infrastructure.

#### Here's the justification for choosing AWS as the cloud provider

##### **1. AWS to AWS Serverless Migration:**

\* Seamless Integration: Leveraging existing AWS services like Route53, EC2, and RDS with serverless options such as Lambda and S3 minimizes compatibility issues, offering a streamlined migration path.

\* Expertise and Familiarity: The IT team's existing knowledge of AWS reduces the learning curve and operational disruptions.

\* Advanced Services: AWS's serverless solutions including Lambda and S3 are continually updated with security and performance enhancements, maintaining a technological edge.

## **2. Upscaling:**

- \* Auto-scaling with Lambda: Automatically adjusts computing resources, essential during traffic spikes or events.
- \* Global Reach with CloudFront: Enhances user experience by reducing latency and speeding up data transfer globally.
- \* Elastic Load Balancing and High Availability: Built-in features in services like ELB and RDS simplify application scaling and uptime.

## **3. Cost Reduction:**

- \* Pay-as-You-Go Pricing: Only pay for resources used which is cost-effective especially for services like Lambda.
- \* No Upfront Investment: Reduces the need for capital investments in hardware favoring operational expenditure.
- \* S3 for Storage: Offers scalable and secure storage at competitive pricing.

## **Workloads to be Migrated:**

**Bridge Web Application:** Deployment servers, static content storage, operational data storage.

**COPI Web Application:** Deployment servers, static content storage, operational data storage.

## **Services Needed for Each Workload:**

**Amazon RDS:** To manage databases efficiently with scalability and automated backups.

**AWS Lambda:** For serverless computing, allowing auto-scaling and cost efficiency.

**AWS CloudWatch:** For monitoring services and operational health.

**AWS Step Functions:** To orchestrate serverless workflows and automate processes.

**AWS Application Load Balancer (ALB):** To distribute incoming traffic efficiently.

**AWS Web Application Firewall (WAF):** For protecting applications from web exploits.

**Amazon S3:** For cost-effective object storage.

**AWS CloudFront:** To deliver content with low latency.

**Amazon Simple Email Service (SES):** For sending notifications and communications.

**AWS Route53:** For DNS management and to enhance application availability.

## **Data Pipeline:**

Implement a streamlined data pipeline using AWS services to ensure efficient data transfer, processing and storage leveraging services like Amazon S3 for storage and AWS Lambda for data processing tasks.

## **Expertise Needed:**

In-depth knowledge of AWS services, cloud security and data management as mentioned in Skills readiness plan.

## **Challenges:**

**Privacy Concerns:** The cloud adoption team faced significant challenges due to privacy restrictions. The primary contact at the company was constrained by privacy policies from sharing detailed information about the existing architecture, specific cloud projects, and the real challenges encountered. This lack of transparency hindered the team's ability to accurately assess the current state and propose a suitable cloud platform.

**Limited Access to Employees:** Arranging meetings with the company's employees proved difficult as most were busy professionals with demanding schedules. This made it challenging for the cloud adoption team to gather comprehensive insights and feedback necessary for an effective cloud strategy.

**Departmental Silos:** The company's technical departments operated in isolation, unaware of the cloud technologies used by other teams. For instance, interactions with the DevOps department only revealed the challenges specific to that team, leaving the adoption team without a full picture of the impact of existing cloud technologies across the entire company.

**Incomplete Financial Insight:** The cloud adoption team lacked complete information about the financial impact of cloud technology on various departments. This absence of detailed profit and loss data related to cloud usage made it difficult to conduct a thorough cost-benefit analysis, crucial for justifying the new cloud adoption plan.

**Unfamiliarity with AWS Services:** The team was not fully versed in all AWS services, including key offerings like CloudWatch and CloudFront. They had to invest additional time in researching these technologies to develop a well-informed and effective cloud adoption strategy.

## **Limitation of the Adoption:**

Our Cloud Adoption Framework for A+E Networks is comprehensive and well-articulated, offering a clear path toward cloud adoption using AWS services to optimize the AdSales web applications. However, even the most thorough frameworks have limitations. Here are some potential limitations of our cloud adoption framework:

**Dependency on a Single Cloud Provider:** The entire framework relies exclusively on Amazon Web Services, as it is used by A+E Networks in current architecture. While AWS is a robust platform, this dependency can lead to risks related to vendor lock-in. Changes in pricing, service availability, or terms of service could have disproportionate impacts.

**Complexity and Technical Challenges:** The migration to serverless and other AWS-specific services such as Lambda and S3 may introduce complexity. There might be technical challenges during the transition particularly with cold starts, networking, integration and code adaptation.

**Performance Implications:** While serverless computing offers scalability, increased efficiency compared to the current architecture, it might also introduce latency issues especially for operations that are not optimized for such architectures.

## **Cost Benefit Analysis:**

As part of the cloud adoption strategy for A+E Networks, we are meticulously analyzing the infrastructure requirements for two of key web applications: Bridge and COPI.

This section provides a detailed cost breakdown [4] of both the current and proposed architecture, focusing on the environment setup, server allocation and storage needs. This overview will guide our decisions to optimize and transition to a cloud-native architecture.

### **Web Application Infrastructure: Bridge**

Bridge is a complex web application at A+E Networks that consists of 27 distinct modules each necessitating dedicated servers across various environments to ensure robust development, testing and production operations.

#### **Server Distribution:**

#### **Development (DEV), Quality Assurance (QA), Debug, and User Acceptance Testing (UAT) Environments:**

Each of these four environments hosts one server per module to handle specific functionalities resulting in a total of **108 EC2 servers** (27 modules × 4 environments).

#### **Production (PROD) Environment:**

To ensure high availability and fault tolerance, the production environment employs two servers per module. This setup comprises **54 EC2 servers** in total thus enhancing reliability and performance for end-users.

#### **Storage Configuration:**

##### **DEV, QA, Debug, and UAT Environments:**

Each environment utilizes one storage server, leading to a total of **4 EC2 servers for storage**. These environments predominantly use dummy data or data from previous months for testing purposes which requires less storage capacity.

##### **PROD Environment:**

Reflecting the high data inflow from legitimate user interactions the production environment is equipped with **two storage servers** ensuring adequate storage and processing capabilities to manage the increased data volume effectively.

### **Web Application Infrastructure: COPI**

The COPI application is a single page web application which is similar to the modules of the Bridge web application. While smaller in scale compared to Bridge, it still demands a structured approach to server allocation and storage across its environments.

## **Server Distribution:**

### **DEV, QA, Debug, and UAT Environments:**

Similar to Bridge, COPI maintains one server per environment across these four environments, totaling **4 EC2 servers**.

### **PROD Environment:**

Adhering to the same principle of fault tolerance as Bridge, the production environment for COPI includes two servers amounting to **2 EC2 servers**.

## **Storage Configuration:**

### **DEV, QA, Debug, and UAT Environments:**

Each environment is allocated one storage server, summing up to **4 EC2 servers**. These servers handle lesser volumes of test data efficiently.

### **PROD Environment:**

With two storage servers, COPI's production environment is well-equipped to manage the higher data demands of real-time user interactions, similar to Bridge.

## **Current Architecture Costs:**

### **1. EC2 Web Servers (Bridge and COPI):**

#### **Development, QA, Debug, and UAT Environments (Bridge):**

Configuration: 108 t3.xlarge instances, Windows Server, On-demand.

Monthly Cost: \$18,921.60

#### **Production Environment (Bridge):**

Configuration: 54 t3.2xlarge instances, Windows Server, On-demand.

Monthly Cost: \$18,921.60

#### **Development, QA, Debug, and UAT Environments (COPI):**

Configuration: 4 t3.2xlarge instances, Windows Server, On-demand.

Monthly Cost: \$1,401.60

#### **Production Environment (COPI):**

Configuration: 2 t3.2xlarge instances, Windows Server, On-demand.

Monthly Cost: \$700.80

**Total Monthly Cost for EC2 Web Servers (Bridge and COPI): \$39,945.60**

### **2. EC2 Storage (Bridge and COPI):**

#### **Development, QA, Debug, and UAT Environments (Bridge):**

Configuration: 4 t3.xlarge instances, Windows Server, On-demand.

Monthly Cost: \$700.80

#### **Production Environment (Bridge):**

Configuration: 2 t3.xlarge instances, Windows Server, On-demand.

Monthly Cost: \$350.40

#### **Development, QA, Debug, and UAT Environments (COPI):**

Configuration: 4 t3.xlarge instances, Windows Server, On-demand.

Monthly Cost: \$700.80

#### **Production Environment (COPI):**

Configuration: 2 t3.xlarge instances, Windows Server, On-demand.  
Monthly Cost: \$350.40

**Total Monthly Cost for EC2 Storage (Bridge and COPI): \$2,102.40**

**Overall Total Monthly Cost for the Current Architecture: \$42,048.00**

**Proposed / New Architecture Costs:**

**1. Amazon S3 Storage:**

**COPI:**

Configuration: 5 TB Standard storage, 5 TB Data returned by S3 Select, S3 Standard 200 PUT and 400 GET requests

S3 Standard cost (monthly): \$121.35

**Bridge:**

Configuration: 10 TB Standard storage, 5 TB Data returned by S3 Select

S3 Standard cost (monthly): \$239.10

**Total Monthly Cost for S3 (Bridge and COPI): \$360.45**

**2. AWS Step Functions:**

**Bridge:**

Configuration: 10 state transitions per workflow x 500 workflow requests = 5,000.00 state transitions (1,000 billable)

Standard Workflows pricing (monthly): \$0.03

**COPI:**

Configuration: 20 state transitions per workflow x 50 workflow requests = 1,000.00 state transitions (no additional billable transitions)

Standard Workflows pricing (monthly): \$0.00

**Total Monthly Cost for Step Functions: \$0.03**

**3. AWS Lambda Functions:**

**Bridge:**

Configuration: 10000 requests per day, 900 ms of duration per each request, 1024 MB of memory allocated and 512 MB of ephemeral storage allocated for 162 (108 Dev, QA, Debug, UAT; 54 Prod) lambda functions

Lambda costs - Without Free Tier (monthly): \$748.44

**COPI:**

Configuration: 5000 requests per day, 900 ms of duration per each request, 1024 MB of memory allocated, and 512 MB of ephemeral storage allocated for 6 (4 Dev, QA, Debug, UAT; 2 Prod) lambda functions

Lambda costs - Without Free Tier (monthly): \$0.48

**Total Monthly Cost for Lambda Functions (Bridge and COPI): \$748.92**

**4. Amazon CloudFront:**

**Bridge and COPI Combined:**

Configuration: 6,000 GB data transfer out to internet and origin, 10,000 HTTPS requests

**Total CloudFront price United States (monthly): \$630.01**

**Overall Total Monthly Cost for the New Architecture: \$1,739.41**

In total, the new architecture would cost approximately \$1,739.41 per month—a significant reduction from the \$42,048.00 required by the current setup. This transition not only cuts costs by over 95% but also improves scalability, performance and reliability through global content distribution and reduced latency.



## 5. Summary

Our Cloud Adoption Framework Report for A+E Networks outlines a strategic plan to migrate AdSales web applications to a serverless cloud-based environment using Amazon Web Services (AWS). The objective is to reduce operational costs, enhance scalability and improve disaster recovery capabilities with expectations to decrease cloud infrastructure costs significantly in the first year post-migration, increase resource utilization and achieve enhanced operational efficiency.

The migration plan involves several key components: integrating AWS Web Application Firewall (WAF) with CloudFront for security enhancements [13] and transitioning backend processes to AWS Lambda for serverless compute [9]. It also includes storing static content, email and operational data on Amazon S3 for improved scalability and reliability [7], utilizing AWS CloudWatch for comprehensive monitoring and logging [11].

The report details a phased migration approach [16] [17] [18] [19] starting with less critical environments like Development (DEV), Debug, User Acceptance Testing (UAT) and Quality Assurance (QA) to minimize risks and gradually extending to all Production (PROD) environments. The final goal within the first two years is to achieve full operational efficiency and optimal cloud cost management.

A+E Networks, established in 1983, is recognized for its extensive portfolio of cultural media brands. The company's AdSales department is crucial for monetizing media content, using specialized web applications that enhance workflow efficiency from advertisement booking to billing. The Cloud Adoption Team, led by senior members like Phani Aravind and Ravi Kumar Varikunta is tasked with ensuring the migration aligns with business objectives and technological needs.

The transition strategy not only aims to streamline operations and reduce costs but also to foster innovation and agility across the organization. This effort is expected to keep A+E Networks competitive in the rapidly evolving media landscape, enhancing customer experiences and operational capabilities through advanced cloud-native technologies and services.

## 6. References

- [1] <https://learn.microsoft.com/en-us/azure/cloud-adoption-framework/strategy/motivations>
- [2] <https://learn.microsoft.com/en-us/azure/cloud-adoption-framework/strategy/business-outcomes/>
- [3] <https://learn.microsoft.com/en-us/azure/cloud-adoption-framework/digital-estate/approach>
- [4] AWS Pricing Calculator, <https://calculator.aws/> Accessed 1 May 2024.
- [5] Amazon Simple Email Service Documentation, [docs.aws.amazon.com/ses/](https://docs.aws.amazon.com/ses/) Accessed 1 May 2024.
- [6] Amazon Elastic Compute Cloud Documentation, [docs.aws.amazon.com/ec2/?icmpid=docs\\_homepage\\_featuredsvcs](https://docs.aws.amazon.com/ec2/?icmpid=docs_homepage_featuredsvcs) Accessed 1 May 2024.
- [7] Amazon Simple Storage Service Documentation, [docs.aws.amazon.com/s3/?icmpid=docs\\_homepage\\_featuredsvcs](https://docs.aws.amazon.com/s3/?icmpid=docs_homepage_featuredsvcs) Accessed 1 May 2024.
- [8] Amazon Relational Database Service, [docs.aws.amazon.com/AmazonRDS/latest/UserGuide/Welcome.html](https://docs.aws.amazon.com/AmazonRDS/latest/UserGuide/Welcome.html) Accessed 1 May 2024.
- [9] AWS Lambda: [docs.aws.amazon.com/lambda/?icmpid=docs\\_homepage\\_featuredsvcs](https://docs.aws.amazon.com/lambda/?icmpid=docs_homepage_featuredsvcs) Accessed 1 May 2024.

- [10] Amazon Virtual Private Cloud Documentation, [docs.aws.amazon.com/vpc/?icmpid=docs\\_homepage\\_featuredsvcs](https://docs.aws.amazon.com/vpc/?icmpid=docs_homepage_featuredsvcs) Accessed 1 May 2024.
- [11] Amazon Cloudwatch, [docs.aws.amazon.com/AmazonCloudWatch/latest/monitoring/WhatIsCloudWatch.html](https://docs.aws.amazon.com/AmazonCloudWatch/latest/monitoring/WhatIsCloudWatch.html) Accessed 1 May 2024.
- [12] Amazon Application Load Balancer/Elastic Load Balancer: <https://docs.aws.amazon.com/elasticloadbalancing/latest/application/introduction.html> Accessed 1 May 2024.
- [13] AWS WAF Documentation, [docs.aws.amazon.com/waf/](https://docs.aws.amazon.com/waf/) Accessed 1 May 2024.
- [14] Amazon Route 53 Documentation, [docs.aws.amazon.com/route53/](https://docs.aws.amazon.com/route53/) Accessed 1 May 2024.
- [15] Amazon Cloudfront Documentation, [docs.aws.amazon.com/cloudfront/](https://docs.aws.amazon.com/cloudfront/) Accessed 1 May 2024.
- [16] AWS Cloud Adoption Framework, [aws.amazon.com/cloud-adoption-framework/](https://aws.amazon.com/cloud-adoption-framework/) Accessed 1 May 2024.
- [17] Google Cloud Adoption Framework: [https://services.google.com/fh/files/misc/google\\_cloud\\_adoption\\_framework\\_whitepaper.pdf](https://services.google.com/fh/files/misc/google_cloud_adoption_framework_whitepaper.pdf) Accessed 1 May 2024.
- [18] Oracle Cloud Adoption Framework: <https://docs.oracle.com/en-us/iaas/Content/cloud-adoption-framework/home.htm> Accessed 1 May 2024.
- [19] <https://www.gartner.com/en/newsroom/press-releases/2021-11-10-gartner-says-cloud-will-be-the-centerpiece-of-new-digital-experiences> Accessed 1 May 2024.
- [20] A+E Networks: <https://www.aenetworks.com/> Accessed 1 May 2024.