

# Discovery Bolsters Media Leadership by Migrating Playout Infrastructure to AWS

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## Introduction



Research indicates that customers recognize significant business benefits after moving workloads to Amazon Web Services (AWS).<sup>1</sup> For the [2019 Cloud Value Benchmarking Study](#), a market research firm surveyed 1,500 AWS customers in the US and quantified the benefits of migrating to AWS. Participants reported reducing overall IT infrastructure cost per user by 27.4 percent, increasing terabytes managed per administrator by 67.7 percent, decreasing application downtime by 56.7 percent, and cutting time-to-market for new products and services by 37.1 percent.<sup>2</sup> With AWS, organizations have leveraged more cost-effective, efficient, reliable, and agile IT operations to spur improved business results and operational efficiencies.

In 2020, the AWS Cloud Economics team conducted an in-depth case study to understand the value realized by [Discovery, Inc.](#), a leader in nonfiction media operating in 220 countries and territories. Discovery delivers over 8,000 hours of original programming each year and has category leadership across content genres around the world. Discovery is a platform innovator, and the company reaches viewers in all sorts of ways, including through direct-to-consumer streaming services, TV Everywhere products, digital-first and social content from Group Nine Media, and partnerships with some of the most visible content providers in the world.

<sup>1</sup> [Larry Carvalho and Matthew Marden, "Fostering Business and Organizational Transformation to Generate Business Value with Amazon Web Services," IDC, 2018.](#)

<sup>2</sup> [Amazon Web Services, "Cloud Value Benchmarking Study Quantifies the Benefits of Cloud Adoption," Amazon Web Services, 2020.](#)

## Migration Details

The global media industry has become increasingly dynamic. As such, Discovery needs the ability to scale quickly and seamlessly when launching new channels, entering new markets, and acquiring other media properties. The company previously had several full-scale data centers dedicated to playout. In broadcasting, this refers to the system that transmits channels to distribution partners, who in turn deliver the content to consumer audiences via broadcast, cable, and satellites. For Discovery, these data centers were a significant cost burden. Maintaining physical infrastructure also slowed the company's growth and innovation as technology evolved and their infrastructure aged.

For these reasons, Discovery decided to migrate its global linear playout system to AWS. "Our business model is built around producing and owning nearly all the programs we put on the air," says Dave Duvall, Chief Information Officer at Discovery. Using AWS for its playout system infrastructure gives Discovery greater agility while enabling the company to manage costs. At the same time, the migration to AWS has also helped the company improve staff productivity and increase operational efficiency.

**"Our media processing needs the scalability of AWS to be effective, especially as direct-to-consumer markets are the driver of our growth."**

– Dave Duvall, Chief Information Officer at Discovery

Discovery uses [Amazon Elastic Compute Cloud](#) (Amazon EC2) instances and [Amazon Simple Storage System](#) (Amazon S3) as the foundation of its cloud-based playout infrastructure. Discovery also uses [AWS Direct Connect](#) to transmit playout streams from Amazon EC2 to the company's on-premises distribution facilities in London, England, and Sterling, Virginia, as well as partner uplink and teleport facilities around the world. The playout system uses approximately 1,000 Amazon EC2 instances for playout, in addition to instances dedicated to testing and quality assurance. It also stores 15 petabytes of content at any given time for broadcasting.

This case study focuses on the value Discovery achieved in the four key areas of the Cloud Value Framework outlined below.

## Achieving business value

### Cloud Value Framework

 Cost savings (TCO)	 Staff productivity	 Operational resilience	 Business agility
<b>What is it?</b> Infrastructure cost savings and cost avoidance achieved by moving to the cloud	<b>What is it?</b> Efficiency improvement by function on a task-by-task basis	<b>What is it?</b> Benefit of improving service-level agreements (SLAs) and reducing unplanned outage	<b>What is it?</b> Deploying new features and applications faster while reducing errors

Differing business requirements, industry needs, and priorities have resulted in unique cloud adoption journeys for many organizations. While organizations adopt different paths toward the cloud, most cases consist of a combination of these four distinct areas of value.

## Cost Savings

**“AWS pricing has come down on almost all the services we rely on. We’ve achieved 50% reduction in operating costs from where we started on AWS to where we sit today.”**

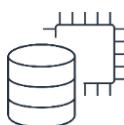
— Dave Duvall,  
Chief Information Officer,  
Discovery

Cost savings refers to the total cost of ownership (TCO) reduction by moving to the cloud. This includes compute, storage, and network cost savings. Leveraging the benefits of elasticity, scale, and right-sizing drives significant savings. AWS customers in the Cloud Value Benchmarking study saw an average of 27% lower spend per user.

Discovery achieved cost savings in the following ways.

Playout systems use industry-standard arrays of servers, which require significant capital outlays when growing system capacity. “We’re not just buying servers one at a time,” says Duvall. “Typically we invest in capacity to launch many channels at once.”

The company used to manage numerous servers for its playout system and incur sunk costs from under-utilized assets. One reason it chose to adopt AWS was the impending need to open a major new data center in Europe. By choosing cloud-based infrastructure instead, the



**Reduced on-premises server footprint from 130 racks to 10**

**"When we buy an asset that will be in use for 36 months, we lose 6 months at the front end and 6 months at the backend for the transition states of bringing it into service or retiring it. Those time frames are massively shortened in AWS."**

— Dave Duvall,  
Chief Information Officer,  
Discovery

**61%**  
**TCO savings**

company avoided paying for fixed infrastructure. In doing so, it reduced its on-premises server footprint from 130 racks to 10 in its London-based facility.

Initially Discovery's cloud infrastructure was at cost parity with its former on-premises spend. But through cost optimization and overall reductions in AWS prices, the company began to see significant savings. And thanks to improvements in GPU performance, Discovery was able to use smaller instance sizes. "AWS pricing has come down on almost all the services we rely on. At the same time, we've seen generational changes in graphical processing unit capability during the same period, meaning we can use smaller instances today than when we launched," says Duvall. "We've achieved 50% reduction in operating costs from where we started on AWS to where we sit today."

Discovery achieved significant savings by leveraging [Amazon EC2 Reserved Instances](#), [Amazon S3 Intelligent-Tiering \(S3 Intelligent-Tiering\)](#), and volume discounts. Additionally, it was able to repurpose costly London real estate by transforming a data center into a production space, ultimately avoiding the need to fund physical data center expansion.

Discovery also avoids the opportunity cost related to fixed asset procurement and installation. This allows the company to steer clear of the non-useable stages of on-premises assets which represent one-third of an asset's lifespan. "When we buy an asset that will be in use for 36 months, we lose 6 months at the front end and 6 months at the backend for the transition states of bringing it into service or retiring it," says Duvall. "Those time frames are massively shortened in AWS."

A TCO analysis done in collaboration with AWS Cloud Economics shows 61 percent lower costs on AWS versus the equivalent on-premises infrastructure required today.

**“Employees who were formerly monitoring 4 channels can now monitor between 40 and 60 channels at a time.”**

— Doug Locke,  
Sr. Director Broadcast  
Operations, Discovery

**Shift from  
50% to 80%**  
of engineers focus  
on innovation



Increased  
productivity by  
**13x**

## Staff Productivity

Staff productivity refers to full-time employee productivity gained from reducing or eliminating time spent on tasks no longer needed with the cloud. These tasks can include hardware procurement, installation, and maintenance; patching and updating operating systems; and managing data center facilities.

Discovery improved staff productivity in the following ways.

More efficient monitoring and management has enabled Discovery to shift its broadcast engineering staff away from day-to-day operational tasks to meeting new business and growth requirements. In the past, 50 percent of engineering resources were focused on innovation and automation. AWS cloud infrastructure has created a reliable infrastructure environment, allowing Discovery engineers to focus further up the stack. Today, 80 percent of engineers focus on innovation and automation efforts delivered through software.

As an example, Discovery’s software automation now monitors playout signals based on errors and exceptions, eliminating the need for constant human monitoring. The shift to automated monitoring has helped increase productivity by 13 times. “Employees who were formerly monitoring 4 channels can now monitor between 40 and 60 channels at a time,” says Doug Locke, Sr. Director Broadcast Operations. As a result, Discovery can now roll out new channels without increasing staff headcount.

## Operational Resilience

Operational resilience refers to the benefit of improved security and availability. AWS customers reduce their downtime by taking advantage of the stability, scalability, reliability, and security of the AWS environment. According to a survey by Nucleus Research, AWS customers saw a 29% decrease in planned downtime and a 69% reduction in unplanned downtime after migrating on-premises applications to AWS.<sup>3</sup>

Discovery enhanced operational resilience in the following ways.

<sup>3</sup> Daniel Elman, "Understanding the Value of Migrating from On-Premises to AWS for Application Security and Performance," Nucleus Research, 2020.



Perform **multiple production upgrades** in a single week vs one to two a year

**"We've been able to upgrade all of our global video playout chains over a multi-night maintenance period using automated deployment, with no disruption to customers. That was simply unheard of in the on-premises playout world."**

– Ron Yoslov, GVP Broadcast Engineering and Operations, Discovery

**Increased uptime from  
99.9% to  
99.999%**

Migrating to AWS has provided greater redundancy for Discovery's playout infrastructure. In its previous playout architecture, redundant servers were always running, but typically were housed in the same facility reducing fault tolerance in the event of a facility-level failure.

With AWS, Discovery uses a multi-region model of redundancy. A server running in a [US AWS Region](#) will have its backup running in a European AWS Region. This variability ensures facility-level disaster recovery combined with high availability and enables workloads to be mixed across regions as needed. Previously, if hardware failed, the company would have to run "at risk," without redundant capability, until the vendor could provide a replacement, which could take days or weeks. Now, with automated deployment, the company can instantly replace failed instances to ensure near continuous high availability.

Adopting AWS has transformed the way Discovery keeps its systems up to date. On-premises playout systems can go many years without updates due to the cost of running redundant systems to avoid outages. Now, Discovery can perform red-black deployments throughout the environment. "We've been able to upgrade all of our global video playout chains over a multi-night maintenance period using automated deployment, with no disruption to customers," says Ron Yoslov, GVP Broadcast Engineering and Operations. "That was simply unheard of in the on-premises playout world."

The redundant infrastructure not currently being used for playout is upgraded and then moved to production. The infrastructure, now no longer in production, can then be upgraded. Yoslov compares the difference: "Previously, the difficulty of upgrades allowed for only one or two a year. Today, Discovery often performs multiple production upgrades in a single week."

The cloud upgrade process eliminates any impact to customers' video experience, with an improvement from an average of 99.9 percent uptime to 99.999 percent uptime. That means 7 seconds per week of interruption compared to 240 seconds, a 97 percent decrease. "With the service-level agreements provided by AWS and the connectivity plan we've invested in, we feel comfortable running our multi-billion-dollar business on a two-site architecture," says Duvall.

## Business Agility

Business agility is the benefit from being able to innovate more and respond faster. AWS enables customers to reduce time-to-market, develop more applications, update applications more frequently, and improve software quality. This, in turn, leads to more satisfied customers and employees, higher revenues, and higher profits. AWS customers in the Cloud Value Benchmarking study were able to decrease time-to-market for new products and services by an average of 37%.

Discovery increased business agility in a number of ways.

**“Investing in a major data center facility requires us to think in terms of an investment that will last for 20–30 years. AWS gives us the flexibility to pivot quickly and meet the needs of the market instead of being locked in by legacy technology.”**

— Dave Duvall,  
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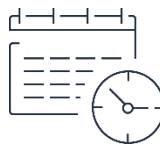
Discovery has achieved significant agility benefits since migrating its playout infrastructure to AWS. “Investing in a major data center facility requires us to think in terms of an investment that will last for 20–30 years,” says Duvall. “We can’t imagine feeling certain about the state of the linear playout market for that length of time. AWS gives us the flexibility to pivot quickly and meet the needs of the market instead of being locked in by legacy technology.” Using automated deployment, the company can make the switch from instance types in a matter of hours or days and immediately reap the value of that shift. Now Discovery no longer plans those changes months in advance and instead can respond quickly to market needs.

A recent example of improved business agility arose from Discovery’s shift of licensing for a group of channels from the UK to Amsterdam following Brexit. The company stood up parallel playout chains to test the Amsterdam licensing configuration. Once confirmed, Discovery cut over to the Amsterdam configuration and turned off the playout chains running UK licensing. Previously, this would have required a costly and time-consuming change management project and the provisioning of redundant physical infrastructure—but not anymore. “We could have 50 more playout instances running on a new configuration tomorrow if we wanted to,” says Duvall. “We pay minor on-demand dual-run costs, but it’s a fraction of what it would cost to do it in a data center, and we have the confidence that it’ll work because we can test it as much as we’d like.”

Cut the time to launch new services by  
**50%**



Handles granular regionalization needs



Can launch a new channel in days vs months

Overall, the company has cut the time to launch new services by 50 percent. “We’d typically be on a 90-day timeline to get something from request to launch before,” says Josh Rodman, Sr. Director Media Engineering. “We do it in half the time now because once we have the configuration ready, we just test and launch. Most of the remaining time is made up with measurement certifications by external parties. Without those requirements, we could launch a new channel in a few days.”

For example, when acquiring Scripps Networks Interactive, Discovery could onboard the playout within 5 months from deal close with little to no capital investment. In a traditional datacenter, the procurement and install process alone for the fixed assets would have taken 3-5 months before testing activities could commence. When launching services in new markets in Europe, the Middle East, and Africa, Discovery can quickly handle granular regionalization needs such as multiple languages, subtitles, and local ad insertion.

The agility of the AWS Cloud has positive outcomes for Discovery beyond playout. For example, when Discovery signs a new distribution content deal requiring the delivery of thousands of hours of library content for an on-demand service, the company needs to transcode those assets to meet format requirements, and revenue cannot be realized until the assets are delivered. “In the old days, this would lead to long processes where we would have to decide whether to buy more encoders, and then we’d spend weeks procuring and installing them,” says Rob Goldheim, GVP of Production Engineering. “I can remember nail-biting end-of-quarter periods where we were desperately trying to get the last asset out of the door so we could recognize it on that quarter’s financials. That is not even something we talk about any longer.” Thanks to AWS, Discovery can align the infrastructure to the desired business outcome, whether it’s time to market or efficiency.

## Conclusion

The global media market is both volatile and competitive. Discovery has maintained its leadership position by aggressively adopting AWS services, including Amazon EC2 and Amazon S3 to improve agility, resilience, productivity, and cost efficiency. As a result, Discovery can deploy new channels faster, focus on growth and innovation, and pivot to meet the needs of an evolving market. Migrating to AWS has enabled Discovery to modernize its playout infrastructure while ensuring reliability for affiliates and content consumers. The company continues to leverage AWS services to support the creation and delivery of compelling content worldwide.