AWS FOR EVERY APPLICATION

How leading businesses build game-changing applications with AWS

Reimagine every application with the most innovative cloud
Applications power businesses of all kinds

Today, applications play a defining role in businesses of every size across almost every industry.

Many enterprises rely on applications for ERP, HR management, and payroll systems, as well as custom applications that support their core businesses. Start-ups and Small and Medium Businesses (SMBs) are developing interactive web applications, streaming platforms, real-time gaming applications, and eCommerce sites to bring innovative new products and experiences to market.

From an insurance application used to analyze claims, to an Internet of Things (IoT) application used for predictive maintenance, businesses in every industry are powered by applications.

The way these applications are built and run has evolved significantly in the past few years. Cloud computing has helped make the process faster, easier and more efficient.

With the cloud, businesses can build, run, and scale applications in a number of ways. You have flexible options and choices that suit your unique needs. For example, you can decide to deploy your application on an IaaS (Infrastructure as a Service) allowing you more control or use serverless services so that you can focus on your code without worrying about the underlying infrastructure.
“With AWS computational and integration capabilities, combined with our proprietary Drug Design Studio, our scientists can have an idea for a unique protein, order it online that day, and be running preclinical experiments on it in less than a month. In traditional pharmaceutical research and development, it would take years to get to the point where you are ready for even preclinical studies, much less testing your drug in humans.”

Marcello Damiani, Chief Digital Officer, Moderna Therapeutic

Not only does the cloud provide flexible, scalable, and cost-effective infrastructure on which to run a huge range of application types and architectures, it also offers hundreds of tools and services—from compute, storage, and networking to IoT, AI/ML and robotics—that enable companies to develop innovative applications for almost any use case. For example:

- **In banking**, cloud-native applications are delivering more convenient and personalized experiences to millions of customers around the world, all day and every day.

- **In healthcare**, high performance computing (HPC) offers virtually unlimited compute capacity for large, complex simulations to help accelerate drug discovery, research and clinical trials.

- **In agriculture**, IoT technology is enabling farmers to develop innovative crop production techniques in areas like smart greenhouses and precision agriculture to produce more, high quality crops efficiently.

- **In entertainment**, artists are using cloud-based creative applications to collaborate across geographic boundaries and create some of the world’s favorite TV shows.

This eBook explores some of the ways businesses are harnessing the power of AWS to run a wide range of applications and bring revolutionary ideas to market. The security, performance, scale, and innovation that AWS offers enables customers to build applications that they likely couldn’t build on their own. So, as you’ll see in the following stories, businesses are taking advantage of AWS to solve some of the toughest challenges, bring innovative products to market quickly, taking customer experience to the next level and driving exponential business growth.

Learn how these customers across various industries are running a variety of applications successfully on AWS and check out resources to get started on AWS today.
At AWS, there's unwavering focus on addressing customers' biggest challenges. It starts with deep understanding of their needs and delivering solutions to address them. Since applications are so critical to businesses, AWS strives to support every application that customers might be running today or planning to build in the future. This broad range of applications includes:

**Enterprise applications**

Using technologies such as SAP, Oracle, IBM, and other ERP technologies.

Siemens migrated their legacy SAP system to AWS to increase agility and reduce costs.

**HPC & AI applications**

Running large, complex simulations, and deep learning workloads such as weather forecasting and genomics research.

Researchers from Dana-Farber Cancer Institute are using AWS for faster and more efficient drug discovery experiments.

**Modern applications**

Such as modern serverless applications, containers-based applications, and machine learning applications.

HBO Max uses event-driven architecture to scale their direct-to-consumer platform.

**Low latency applications**

Such as real-time multiplayer games or high-frequency trading applications.

Netflix empowered their artists to work remotely with low latency workstations for content development.

**IoT applications**

Which connect and manage billions of devices for industrial, consumer, commercial, and automotive workloads.

John Deere uses AWS IoT for precision agriculture and improving factory operations.

**Hybrid cloud**

Taking advantage of the benefits of the cloud and a consistent AWS experience wherever customers need it including in the cloud, on premises, and at the edge.

Morningstar used AWS Outposts to build and run AWS services in its on-premises data centers.
Top of mind for decision makers

Business leaders and decision makers need to feel confident that they’re running applications in environments that can support their current needs as well as offer a solid foundation for the future. They need to make careful considerations across many areas.

**Security and reliability**

More and more companies are looking to their cloud provider to offer built-in security so that they can focus on their applications. Maintaining security and compliance and preventing inadvertent access to sensitive data is top of mind for most business leaders. Building, running, and scaling applications without interruptions is crucial for any business. Poor performance, latency, or downtime can severely impact business.

**Consistent experience across environments**

While companies are increasingly deploying their applications in the cloud, they may still need to run some of their mission-critical applications on premises to ensure faster response times and/or meet data residency requirements. Some companies also have hybrid and edge use cases where they need to support low-latency applications or process data locally. In such scenarios, inconsistencies across environments can impact productivity or slow innovation.

**Performance and cost optimization**

As businesses grow, applications supporting the business should be able to scale effortlessly. It’s crucial for these applications to have high performance to deliver the best customer experience. With the current economic challenges, business leaders are also pressed to do more with less. They need to deliver on higher performance needs to meet SLAs and drive business growth while managing costs.

**Staying competitive and innovative**

As business priorities shift, the needs of applications powering the business also change. To stay competitive, companies should have access to the latest technology to improve their applications and efficiently deliver new solutions. Many business leaders are looking for solutions that support the needs of the applications they’re running today as well as the ones they’ll build in the future.
Why AWS is the best cloud for your applications

AWS offers the most comprehensive set of capabilities for building, running and scaling applications in the cloud, on premises, and at the network edge. Millions of customers, including large global enterprises, government organizations, and start-ups, trust the capabilities, reliability, and security of AWS to run their mission-critical applications.

- **The most secure and reliable cloud**: AWS offers significantly more security, compliance and governance capabilities than any other cloud provider, so you can build and run your applications with confidence.

- **Best value and performance from your infrastructure**: AWS continuously innovates to deliver the highest performance at lowest costs. With a broad range of services, purchasing options and tools to drive efficiency and cost optimization, you can save money and do more with less.

- **AWS infrastructure and services wherever you need it**: With AWS, you can use the same infrastructure, services, and tools to build and run your applications wherever you need them – in the cloud, on-premises or at the edge.

- **Most capabilities for all your applications**: AWS offers the broadest and deepest choice of compute and storage, the fastest networking, broadest portfolio of databases, and over 200 services to build and run any type of application.

In the following pages, you can read success stories that show how organizations of various sizes across different industries and geographic locations take advantage of AWS services to develop and run some of the world’s most innovative applications.
Nissan in Europe improves SAP processing times by 63%

About Nissan in Europe

Nissan in Europe is part of Nissan Motor Co., Ltd., a global automotive manufacturer that began domestic vehicle production in the early 1900s. Nissan in Europe’s IT organization supports all the company’s lines of business, from manufacturing to finance and marketing.

The challenge

Nissan in Europe realized that the recovery times for its on-premises Systems Applications and Products (SAP) system were too long. At the same time, they recognized the need to make changes in their data center, so they could manage the huge volumes of data involved in tracking the development costs of new vehicles.

The AWS solution

Nissan in Europe migrated its SAP system onto Amazon Elastic Compute Cloud (Amazon EC2) instances. The migration was complex, and required moving a large number of modules. These included Nissan in Europe’s SAP ERP central component application servers and database, and several important business intelligence instances. SAP specialists Accenture supported the SAP migration to make sure it went smoothly.

The results

Since the migration, Nissan in Europe has achieved an improvement in SAP-related business processes of 63 percent, which has enabled employees to perform their jobs more productively. Database recovery time is down to two hours—in line with business requirements. And the company can now run more complex calculations on its SAP material ledger, to keep tighter control of manufacturing costs.

“On AWS, we have noticed a significant performance improvement of about 63 percent for the duration of overall processes.”
Richard van der Meer, Vice President and Chief Information Officer, Nissan AMIEO

AWS services used

- Amazon EC2
- Amazon Simple Storage Service (Amazon S3)
- Amazon Elastic Block Storage (EBS)
- AWS Storage Gateway
About Capital One

From day one, Capital One's mission was to disrupt the banking and financial services industry through technology. Founded in 1994, Capital One has pioneered convenient digital alternatives to traditional banking and is now one of the largest banks in the USA.

The challenge

As part of its goal to lead the banking industry for customer innovation, Capital One wanted to start building its own enterprise applications. This meant hiring top engineering and software development talent—and creating a development platform capable of supporting agile processes and a DevOps approach.

The AWS solution

Capital One's existing Amazon EC2 services offered an ideal way to provision development environments almost instantly, at virtually unlimited scale, so Capital One's developers can create unique and appealing customer experiences. Access to AWS microservices means developers can easily create innovative in-application customer experiences—from intelligent assistants that protect customers' money to free tools that apply real-time discounts to purchases.

The results

By going all-in on AWS, Capital One is setting the standard in the banking industry for outstanding customer experiences. They have reduced the average time needed to build development environments from three months to just minutes, and now release new code many times each day, instead of at monthly intervals.

“...we have successfully exited all of our data centers and gone all in on AWS, enabling instant provisioning of architecture and rapid innovation... On AWS, our technology teams are freed to focus on what they do best: building great software and delivering innovation to our customers.”

Rob Alexander, Chief Information Officer, Capital One

AWS services used

- Amazon Connect
- Amazon EC2
- Amazon Relational Database Service
- AWS Lambda
Lion delivers more personalized experiences to 25,000 trade customers

About Lion
Lion’s portfolio of beverages includes many locally loved brands in Australia and New Zealand. Headquartered in Sydney, Australia, and dating back more than 180 years, Lion is known for its commitment to quality, craftsmanship, community, and sustainability.

The challenge
Lion’s SAP enterprise resource planning (ERP) system enabled its trade customers to order stock. But it was clear from their feedback that customers wanted more personalized digital ordering and self-service experiences.

The AWS solution
Working with AWS Partner Bourne Digital, Lion co-created a new customer facing mobile application and web portal which could be seamlessly integrated with its current SAP environment. Using AWS’ serverless technologies like AWS Lambda and Amazon DynamoDB, they delivered Lion Marketplace far faster than expected, hitting their budget targets and meeting their customers’ expectations.

“The results
Lion’s 25,000 retail, restaurant, and vendor customers can now access new capabilities that make ordering quicker and easier—like powerful new search tools, notifications on stock levels, and personalized product recommendations. Lion Marketplace’s design supports agile development, so the company can easily make changes based on user feedback to improve customer experiences.

“We can iterate faster now. Whether it’s making changes based on our own internal feedback or feedback from our users. This is partly due to our agile approach, but also because we’re a small company using a flexible AWS framework.”
Robb Simpson, Digital Director, Lion New Zealand

AWS services used
• Amazon DynamoDB
• AWS Lambda
• AWS API Gateway
DataFarming empowers 28,000 farms with actionable intelligence on environmental risks

About DataFarming

DataFarming helps farmers tackle challenges like pests and diseases by providing them with high-quality data from satellite imagery. Established in 2017 and based in Queensland, Australia, DataFarming's services are making precision agriculture more affordable and accessible for Australia's farming community.

The challenge

DataFarming found that processing high-resolution satellite imagery on a daily basis created unacceptable bottlenecks. They wanted to find a way to process and share insights faster, and make sure that data could be delivered to farmers’ mobile applications in the smallest possible package, given that many rural areas have limited bandwidth.

The AWS solution

As an AWS customer, DataFarming made an easy switch to Amazon Elastic Container Service (Amazon ECS). This meant they could use event-driven processing to analyze data and get actionable intelligence to farmers more quickly.

The results

DataFarming has reached 40 percent of the Australian grains market in just four years. It processes data from 35 million acres of farmland in its new containerized applications, and delivers time-critical insights to 28,000 farms, so farmers can better manage their crops and pastures.

“AWS empowers us to rapidly implement solutions and react to changing requirements from people in the field and respond to them quickly.”

Paul Grambauer, Senior Software Engineer, DataFarming

AWS services used

- Amazon ECS
- AWS Lambda
- Amazon EC2 Spot Instances
- Amazon S3
23andMe completes HPC application workloads 33% faster

About 23andMe

Genomics and biotechnology company 23andMe provides direct-to-customer DNA testing, giving customers valuable insights into their genetics and ancestry. Founded in 2006, in San Francisco, California, the company uses the data it collects to research human biology and develop new therapies.

The challenge

As the genetic testing market gathered momentum, 23andMe needed more scalability and flexibility than its on-premises HPC facility could deliver. After initially testing a hybrid approach, 23andMe decided to migrate all its systems onto AWS.

The AWS solution

23andMe used the AWS Migration Acceleration Program (MAP) to migrate its HPC applications out of its data center and into the AWS cloud in just four months. Now they can choose from a menu of Amazon EC2 instances designed for compute intensive HPC applications, and match workloads to EC2 instances to achieve the best price/performance ratio.

Read the full story ›
AWS for high performance computing ›

The results

With AWS HPC services, 23andMe can scale on demand to run HPC workloads—using up to 80,000 virtual CPUs for the most processing-intensive jobs—then scale down to conserve costs. Workloads are now completed up to 33 percent faster, and researchers are working more efficiently, which will help them get more quickly to the next breakthrough in genetic discovery.

“To give a sense of scale, we had a peak compute job running with over 80,000 virtual CPUs operating at once.”
Arnold de Leon, Sr. Program Manager, 23andMe

AWS services used

- Amazon EC2
- Amazon S3
- AWS MAP
- AWS Batch
Finch Computing reduces ML inference costs by 80%

About Finch Computing

Finch Computing is a natural language processing (NLP) company that uses machine learning to help customers gain near-real-time insights from text. Clients include large media companies, government and financial institutions.

The challenge

Finch needed to fulfill customers' requests to support additional languages in its software. Its neural translation models using deep learning algorithms had a heavy compute requirement that depended on GPUs. The company was looking for a scalable solution that would grow to support global data feeds and give it the ability to iterate new language models quickly and cost-effectively.

The AWS solution

As an existing AWS customer, Finch opted for AWS Inferentia, a high-performance machine learning inference accelerator, purpose built by AWS, to accelerate deep learning workloads.

The results

Creating a compute infrastructure centered around AWS Inferentia (Inf1 instances), Finch reduced its costs by more than 80 percent compared with the use of GPUs while maintaining its throughput and response times for its customers. Finch accelerated its time to market, expanded its NLP to support three additional languages, and attracted new customers.

“Using AWS Inferentia, we are able to get the throughput and performance needed at a price point that our customers can afford.”
Scott Lightner, CTO and Founder, Finch Computing

AWS services used

- AWS Inferentia
- Amazon EC2
- Amazon ECS
Riot Games nixes “peeker’s advantage” with AWS Outposts

About Riot Games
Since 2006, Riot Games has created some of the world’s best loved video games, including Valorant, Wild Rift and League of Legends—the most widely played PC game in the world. A long-term AWS customer, Riot Games historically ran its games on a mix of AWS cloud instances and game servers in colocation sites.

The challenge
With the global launch of Valorant, a tactical shooting game, Riot wanted to reduce “peeker’s advantage.” This technical glitch rewards aggressive gameplay because defending players are always reacting to delays caused by server latency. Taking the view that any problem that creates unfairness needs solving, Riot Games decided to rethink their worldwide game server architecture.

The AWS solution
During the Beta test of Valorant, Riot Games realized that demand from players was extremely high, and that extra server capacity was needed ASAP. Riot Games opted to deploy AWS Outposts in new colocation sites. Because their AWS Outpost game servers were standardized on an established Riot Games build-test-production pipeline, deployment was fast and seamless.

The results
Not only did AWS Outposts solve Riot Games’ shot-term capacity needs. It reduced in-game latency by 10-20 milliseconds, minimizing peeker’s advantage and making gameplay fairer. Riot Games has streamlined deployments by using the same tools and APIs on-premises and in the cloud, which meant Valorant was rolled out fast and efficiently, as well as delivering a great player experience.

“With Outposts, AWS gave us a unique solution to ensure a level playing fields for all our players”
Zach Blitz, Head of Infrastructure, Riot Games

AWS services used
• AWS Outposts

Watch the full story ➞
AWS for low-latency applications ➞
Netflix achieves single-digit latency for its virtual VFX workstation applications

About Netflix

Netflix is the world’s leading internet television network, with 200m customers in 190+ countries. Netflix is all in with AWS—including its VFX studio in the cloud, which empowers the global community of Netflix artists and partners with powerful creative and collaboration tools.

The challenge

To reduce lag and make collaboration a more seamless experience for its content creators, Netflix wanted to reduce the latency of the applications in its VFX cloud. The nature of the creative industry means many animators and SFX specialists work remotely. So the new solution needed to deliver remote desktops and application-streaming over varying network conditions.

The AWS solution

In 2020, AWS began using AWS Local Zones for its VFX studio. These locate AWS computer, storage and database resources at the network edge, close to large population and industry centers, where creative professionals are often based. This means Netflix can deliver latency-sensitive digital VFX applications closer to its artists, improving the user experience even with graphics-intensive applications like video editing and rendering.

The results

With AWS Local Zones, Netflix is achieving single-digit millisecond latency for its creative applications, and facilitating no-compromise virtual workstations for its VFX studio users. This in turn is fostering collaboration among artists, and enhancing the speed and quality of Netflix content creation across geographic boundaries.

“By taking advantage of AWS Local Zones, we have migrated a portion of our content-creation process to AWS while creating an even better experience for artists.”

Stephen Kowalski, Director of Digital Production Infrastructure Engineering, Netflix

AWS services used

- AWS Local Zones
- Amazon EC2
- NICE DCV
- Amazon EC2 G5 Instances
Growy gets set for growth in vertical farming with IoT and automation

About Growy
Netherlands-based startup Growy builds and runs automated vertical farms. Using robotics and automation to tend to herbs, salads, and microgreens throughout their lifecycle, Growy keeps quality high and pricing sharp with little or no human intervention.

The challenge
Growy has ambitious expansion plans. So it wanted to establish a repeatable infrastructure model for capturing and analyzing IoT sensor data from 400+ cameras and 200+ robots. Growy depends on this data to monitor and measure the condition of its plants as they grow, so reliability is paramount.

The AWS solution
Growy chose Amazon IoT Events, a fully managed service that makes it easy to detect and respond to events from IoT sensors and applications. The AWS service analyzes over one million data points per year for Growy, comparing captured data to plant profiles and instructing robots to make any changes required to maintain crops in peak condition.

The results
Growy is confident that AWS IoT Events ticks both its growth boxes: equipping the company to grow quality produce at competitive prices, and supporting its strategy for growing the business. To open new farms, Growy will simply need to connect the IT and IoT systems in its new sites to its existing AWS infrastructure – the perfect recipe for scaling the business.

“With very little work, we can add more processing power, storage, and other services when we need them. Using AWS, our life is easier.”
Jochem Meuwese, Head of Development, Growy

AWS services used
- AWS IoT Events
- AWS Fargate
- AWS Lambda
Honda's Connected Car platform helps millions of drivers to travel safely

About Honda

Honda Motor Co., Ltd. (“Honda”) is a world-leading manufacturer of motorcycles, automobiles, and power products. The company combines innovations in energy and connected technologies to provide cleaner, safer transport that changes people’s daily lives for the better.

The challenge

Honda already used Amazon EC2 to support worldwide data collection and storage for its Connected Car platform. For the next generation of the platform, Honda wanted to make more use of containers and microservices. Their goal was to reduce application processing workloads and roll out services more quickly; and to better manage the fast-growing volumes of data generated by its connected vehicles.

The AWS solution

With support from AWS Professional Services, Honda rearchitected its Connected Cars platform—offloading infrastructure management using a serverless architecture based on AWS Fargate and AWS Lambda. This simplified capacity planning, and equipped Honda to process all the real-time data generated by its vehicles’ IoT sensors. The new platform also enables vehicles to communicate bidirectionally with the cloud using AWS IoT Core.

The results

Millions of Honda cars are now using real-time IoT data to help make transport safer, cleaner, and more efficient. The Connected Car platform’s serverless architecture enabled Honda to deploy the platform in all its regions more quickly than previously, with compliant server environments built in Japan rolled out worldwide in just two weeks.

“AWS Professional Services gave us great advice in areas such as scalable architectures and system recovery and constantly provided proactive suggestions.”

Yozo Takehara, Assistant Chief Engineer from the Honda Global Platform Department, Honda

AWS services used

- AWS Professional Services
- AWS CloudFormation
- AWS Developer Tools
- Amazon EC2
- AWS IoT Core

Read the full story »
AWS for IoT applications »
FanDuel navigates compliance challenges with AWS Outposts

About FanDuel

FanDuel Group is the premier destination for sports fans online, and is on a mission to become the number one sports betting brand in the USA. Founded in 2009, FanDuel’s goal is to offer sports betting opportunities to customers in every US state.

The challenge

To comply with US laws on data residency, FanDuel needed to open a new data center in each state where it traded. FanDuel fully recognized the importance of meeting its regulatory obligations, but wanted a more efficient way to protect customer data, and to comply with restrictions on data crossing state and national borders.

The AWS solution

FanDuel found the ideal solution in AWS Outposts. The business runs its applications on AWS Outposts racks that it situates in compliant locations. In addition, this hybrid approach is enabling FanDuel to reproduce deployments and roll out production-ready instances of applications and platforms on standardized AWS infrastructure whenever it opens new sites.

The results

With AWS Outposts, FanDuel can meet its data residency requirements using an efficient and repeatable process. By taking a hybrid approach, FanDuel can now get faster to market, with deployments that previously took up to 4 months taking just 20 days. Best of all, FanDuel offers better customer experiences, with up to 40 percent performance improvements vs. off the shelf hardware.

“By using AWS Outposts, we are deploying and ensuring that the data is as close to where we need it be from a performance perspective and a customer stability perspective, whilst meeting all of our regulatory obligations.”

Shane Sweeney, VP of IT, FanDuel

AWS services used

- AWS Outposts
Philips enables split-second decisions in critical care with hybrid cloud

About Philips

Founded in 1891, Philips is a leading healthcare technology business. The company is driven by its purpose to improve people’s health and wellbeing through innovation. Philips invested €1.8 billion in R&D in 2021, with 50 percent of this figure dedicated to software and data science.

The challenge

The clinicians who use Philips systems in critical and acute care settings need to access patient and diagnostic data in near-real time. But the sheer volume of data and computation involved means this analysis can’t always be performed quickly enough by on-premises applications.

The AWS solution

To deliver the split-second insights clinicians need, Philips uses AWS Outposts to provide hospitals, clinics, and other care providers with an on-premises platform on which to run acute patient monitoring application and diagnostics tools. This hybrid set-up enables Philips to develop and deploy applications on the same infrastructure on-premises that’s in the cloud, which gives customers’ IT teams a consistent experience.

The results

The low latency and local data processing capabilities of AWS Outposts is enabling Philips’ customers to get the insights they need to make fast and appropriate patient interventions. With all its applications running on the AWS platform, Philips has now deployed healthcare customer solutions on over 70,000 servers in 1,200 locations.

“For us, [with AWS Outposts] the learning curve is zero.”
Rich Ridolfo, Sr Director, Operations, Philips

AWS services used

- AWS Outposts
Future-proof your business for success in a changing world

Now that you know more about the unique capabilities AWS offers to support your applications, let’s take a look at the specific benefits customers have achieved working with AWS. Across thousands of successful migrations, we’ve helped our customers achieve the following:

- 31 percent average infrastructure cost savings
- 43 percent fewer security incidents per year
- 62 percent IT staff productivity boost
- Three times more features delivered per year

Customers from a variety of industries are using AWS to migrate and modernize their applications. For more than 10 years, we’ve driven successful migrations for organizations across nearly every industry and of all shapes and sizes. Learn how AWS can help you with your digital transformation and offers the most secure, reliable, and capable cloud infrastructure for virtually every application.

Get started today

- Learn more about AWS for Every Application
- Read customer success stories
- Explore AWS migration solutions

1 “Moderna Therapeutics Delivers mRNA Drugs Faster, at Lower Cost Using AWS,” Amazon, 2017
2 “2022 Gartner Magic Quadrant for Cloud Infrastructure and Platform Services,” Gartner, 2022
3 “The Forrester Wave™: Public Cloud Development and Infrastructure Platforms, Global, Q4,” Forrester, 2022

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