Accelerating your AWS journey:

Migration and modernization
for public sector organizations

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How can I drive sustainable transformation?

Today's software-driven organizations want to become more agile so they can innovate and respond to changes faster. However, they also manage a portfolio of complex applications and workloads that were built over a long period of time.

When software organizations re-evaluate their application portfolios, they have the opportunity to consider function, features, and strategic requirements and which applications to retain and which to retire. They may choose to move some applications to the cloud to gain total cost-of-ownership (TCO) benefits or invest in rewriting the applications in a cloud-native manner to maximize agility. We call these decisions The 7 Rs:

- Retain
- Retire
- Relocate
- Rehost
- Repurchase
- Replatform
- Refactor

The 7 Rs are part of the cloud journey toward realizing the benefits offered by Amazon Web Services (AWS). With an understanding of the technical architecture and user value of applications, all organizations are better equipped to make sound decisions.

As our customers pursue the reality of migration and operating in a cloud-first development environment, they often tell us that their ability to move fast on the right path is a critical differentiator. Without speed, organizations begin to lose momentum and executive buy-in wanes. When results are realized too slowly (or aren't properly quantified and communicated), the business case weakens—potentially jeopardizing the project's financing and support. For many software organizations, moving to the cloud quickly is the best first step.

"Migrating our network to AWS and modernizing our applications that process over US$1.5 trillion in healthcare claims has let us transform the scalability of our service delivered to the nation's hospitals and health plans. We improved our development velocity and reliability using native AWS capabilities."

Neil de Crescenzo, President & CEO,
Change Healthcare

Specifically, migrating with AWS leads to an average infrastructure cost savings of 66 percent, with substantial benefits extending into other metrics. Migrating applications with AWS results in a 43 percent lower time to market for new features, a 29 percent boost in staff productivity, and 45 percent fewer security-related incidents.[1]

Further, AWS customers we've identified as transformation and modernization "high performers" are greatly outpacing the status quo. These companies establish 46x more releases, 400x faster lead times, 170x faster mean times to recover (MTTR), 90% more automation, and a 5x lower failure rate.

By re-evaluating their application portfolios—and considering whether migration or modernization is the best approach for each application—software organizations can improve agility and increase innovation. Approaching modernization in a unified, holistic way can reduce costs and help build and maintain the momentum needed to sustain long-term transformation.

[1] "Maximizing Economic Advantages by Migrating to AWS Cloud Infrastructure," Enterprise Strategy Group, 2023

Why are migration and modernization important to organizations today?

Today's software organizations are generally tasked with achieving three critical objectives. First, they must respond to user demands. This requires fast, dynamic scalability—the ability to quickly and reliably scale up to meet the needs of millions of users and back down when demand subsides, again and again, all without wasting budget.

Next, competitive pressures are charging today's IT professionals with the often-contradictory goals of succeeding in an increasingly crowded marketplace while also reducing costs.

Finally, IT professionals must continuously e new users, delighting them with applications that meet their needs in exciting ways.

Today's CPOs must pivot to different directional priorities at a moment's notice—while also pursuing all of them simultaneously

IT professionals are meeting these challenges through application modernization and transformation of their infrastructure. They're pivoting to new models, developing unique and engaging experiences, enabling remote working and remote learning for staff, and optimizing processes for greater agility, more frequent application development, and cost reduction.

Cloud migration is often an essential component of these strategies. The cloud enables faster and more frequent application releases, cost reduction through greater management efficiency and data center consolidation, and the freedom to direct more resources toward innovation by outsourcing administrative tasks.

In recent conversations we've had with leading technology decision makers, we've found that organizations are discovering greater success by rethinking their application portfolios and the role of migration in modernization strategies. By viewing migration as an enabler and accelerator of modernization instead of a separate initiative, these leaders are achieving faster, more efficient, and more sustainable results across all of their key imperatives.

Migration and modernization

These terms can have many different meanings, depending on their contexts. But, for simplicity and clarity, here's how we use these words within the pages of this eBook:

Migration

Moving infrastructure and applications with a cloud provider without making any changes to the architecture. Often called rehosting or "lift-and shift," this can be the fastest way to start realizing benefits from the cloud.

Modernization

The adoption of cloud-native technologies (like **AWS Lambda** and **containers**) to reduce operational burdens and maximize cloud value. This is generally achieved via replatforming to managed cloud services or refactoring (also called rearchitecting) applications.

Why should I modernize my application portfolio?

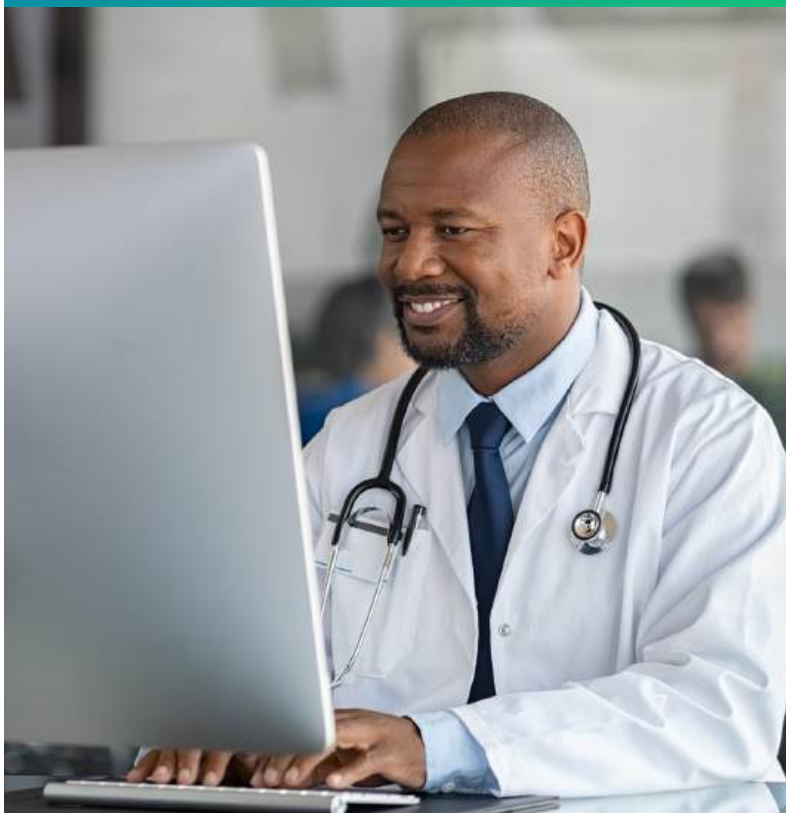
Modern applications increase agility by lowering the time required to build, deploy, and maintain applications that can automatically scale to the needs of the workload. Using the AWS serverless platform, the National Resident Matching Program, decreased hosting costs by 30% while supporting 1000% increased traffic volume.[2]

Modern applications also reduce TCO by improving operational efficiency and resource utilization. By building modern applications, software organizations can reduce their app development costs by 68 percent and lower their TCO.[3]

From conversations we're having with organizations all around the world, we're learning that it's more important than ever for modernization efforts to be accompanied by cost optimization. But software organizations don't have to compromise on cost when they modernize—modernizing applications can reduce costs and enable rapid innovation.

"We've reduced our hosting costs by thirty percent with AWS, because we can spin up different development, staging, user acceptance testing, or performance testing environments to test the system and spin it all down when it's no longer needed...saving that kind of money is important for us as a nonprofit with a limited budget."

Nicole Nitowki, CIO, National Resident Matching Program



[2] "The National Resident Matching Program Works with Pariveda and AWS to Quickly Bring Matching Service to the Public Sector," AWS Case Study
[3] "Build Modern Applications on AWS," AWS

How should I rethink my application portfolio?

All IT professionals are portfolio managers. An application portfolio can be built up over years, if not decades. As cloud economics offer a disruptive opportunity to change, few if any organizations have a large enough IT staff to modernize their entire portfolios at once.

Every software organization's approach to technology modernization will be somewhat different, just as every organization has its own unique challenges and technology landscape. Success will hinge on a complex web of intersecting and divergent elements. However, with over 18 years of experience helping organizations adopt the cloud, we have identified some commonalities and patterns that can significantly help the transformation of an IT posture.

For a larger strategy to be successful, software organizations will need to reduce the size of their application portfolio so that their team can effectively migrate and modernize without overstraining its resources. This is primarily achieved through two methods: **replacement** and **retirement.**

For some applications, the best approach is to replace them with new offerings across software as a service (SaaS), serverless architecture, and containers. We've learned from our customers that most organizations discard 20%–30% of their application portfolios in favor of replacement sets from SaaS vendors. Oftentimes, customers rely on the AWS Marketplace to enable their SaaS strategy.

As software organizations review their application portfolio, they will find that other applications simply need to be retired. Perhaps the applications' capabilities have become outmoded or redundant, or it's discovered that maintaining them requires undue financial resources, time, and workforce commitments. Whatever the case, retiring these applications further lightens the migration and modernization load, leading to faster results that help satisfy stakeholders and strengthen executive buy-in.

AWS Marketplace

AWS Marketplace enables software companies to use trusted vendors when migrating workloads to the cloud. This enables a shift from in-perpetuity licensing to subscription-based, elastic metering and billing. We see customers increasingly embrace serverless models and container-based deployment—both of which contribute to substantially lower compute costs.

Make a plan for your application portfolio

Focus on differentiators

Retire

SaaS

Reduce

the size of the estate through a mix of application retirement and SaaS replacement

Rehost

Move

the bulk of the remaining application portfolio working with a single cloud provider as quickly as possible

Replatform

+

Refactor

Transform

the migrated applications, where developers and engineers can take advantage of the new cloud environment

What are my options as I adopt the cloud?

Software organizations that migrate a substantial part of their application portfolio early in their journey and combine those efforts with modernization initiatives generally drive the fastest results. Migration is often the first step in successful modernization. While every customer's migration journey is unique, we have often seen a standardized process take shape. This process can generally be broken into three phases of activities:

Assess
on-premises resources

Mobilize
address gaps uncovered in assessment

Migrate and modernize
application portfolio

In order to build an effective migration and modernization plan, software companies need to ensure that they have a comprehensive strategy that identifies the best patterns for their application portfolio to achieve results faster.

The 7 Rs: Common use cases and deployment

When teams deeply understand the company's application portfolio and the goals of the business, they're well equipped to choose the next path for each application. The 7 Rs help categorize what is in the environment, what the interdependencies are, and the technical complexities of migration. From there, begin to create a plan on how to migrate each application or set of applications.

AWS Outposts

Realize the benefits of AWS services and innovations by "migrating and modernizing in place" with **AWS Outposts**. This service enables software organizations to use the same AWS infrastructure, services, and tools, both on premises and in the AWS Cloud, for a truly consistent hybrid environment throughout the migration and modernization process.

1 Rehost

Quickly moving applications to the cloud without changing them

2 Replatform

Making a few optimizations to applications—but without changing their core architecture, such as moving from self-managed Kubernetes to **Amazon Elastic Kubernetes Service** (Amazon EKS)

3 Relocate

Move infrastructure to the cloud without purchasing new hardware, rewriting applications, or modifying your existing operations

4 Retain

Leaving the application on premises—or now, at least upgrade

5 Refactor

Changing the way applications are architected and developed, usually by employing cloud-native features

6 Repurchase

Replacing the current environment by moving to a newer version of software or purchasing an entirely new solution

7 Retire

Identifying assets that are no longer useful and turning them off, strengthening the business use case by focusing on more widely used resources

How do I modernize effectively and efficiently?

When we talk about ***modernizing the application portfolio***, we're primarily referring to two specific patterns in The 7 Rs: refactor and replatform. Let's explore each of these patterns again, including real-world success stories to help illustrate what refactoring and replatforming application portfolios may look like.

Refactor: Refactoring means rearchitecting an application into a more modular design, commonly referred to as microservices or modular architecture. The process of refactoring can offer high rewards—adopting modular architectures with serverless technologies improves agility by lowering the time and resources necessary to build, deploy, scale, and maintain applications. It also reduces TCO by improving operational efficiency and resource utilization.

With modular services, there are more moving parts to manage, which is why we recommend adopting serverless technologies as much as possible (**a serverless-first strategy**) to eliminate operational overhead. Most customers approach refactoring by automating software delivery, wrapping the applications with APIs, and decoupling application components. But new applications can be built from the ground up with this modular design and technology to achieve these benefits from the start.

Business-critical applications are prime candidates for refactoring. For example, data warehouses connect organizations to their customers, mobile applications generate new revenue and competitive differentiation for the organization, and backend services power the organization by driving efficiency. When applications in their current form are not fast enough, not scalable, have poor resource utilization, or require a lot of cost and operational overhead to maintain, refactoring is often the best path forward.

Refactoring to microservices also lends itself to the creation of small, independent teams that take ownership of each service. This organizational change fosters an environment of innovation for development teams, giving them the authority to make changes with a lower risk to the organization as a whole.

> **"...utilizing reference architectures along with generative AI reduces the burden on government cloud users and realizes fast and efficient system building."**
>
> Shinichi Nishihata, Cloud Engineer, Japan's Digital Agency

The Japanese Government's Digital Agency used generative AI and "live reference architectures" to migrate systems, resulting in:

800

Systems migrated with AI assistance

REDUCED

development and review time

IMPROVED

security and resilience

Replatform: Replatforming involves moving from self-managed services to fully managed cloud services—but without changing the core architecture of the applications. Teams will typically choose this option for applications that they feel need to be reshaped to match the organization's overall cloud strategy or to better take advantage of the native capabilities of their cloud provider. Cloud providers should be able to provide assistance throughout this process.

Specifically, AWS offers managed services that enable a reduction in operational overhead without rewriting code. For example, if an organization is managing a messaging broker today, it can easily replace it with the fully managed **Amazon MQ service** without rewriting or paying for third-party software licenses. Or, if an organization is migrating a Windows-based application that requires file storage, it can use the fully managed **Amazon FSx for Windows File Server**. To reduce the amount of time spent managing Kubernetes clusters, software companies can move to a managed Kubernetes service like **Amazon EKS**.

When an organization is ready to move existing applications straight to containers, the team can streamline the process through **AWS App2Container** (A2C). A2C is a command-line tool for modernizing .NET and Java applications into containerized applications. It analyzes and builds an inventory of all applications running on virtual machines, on premises, or in the cloud and packages the application artifact and identified dependencies into containers.

> **"We now have unprecedented high availability across the globe, while reducing the average time to bring a change to the stack from four weeks to a matter of hours."**
>
> Jean-Marie Ferdegue, Director, Platform Engineering, Babylon Health

Babylon Health accelerated its mission to provide affordable healthcare using AWS services to:

Develop applications using fast microservices architecture

Create and deploy 300+ containerized applications

Build machine learning (ML) infrastructure on **Amazon EKS** with Kubeflow

Why should I choose AWS to help me with migration and modernization?

With millions of active customers and a global cloud presence since 2006, AWS has the most experience helping software companies of all ages, industries, and geographies benefit from the cloud.

Our software, services, **support**, and **partner ecosystem** can help organizations optimize results and **provide them with prescriptive guidance** throughout every phase of their cloud migration and modernization journey. As software organizations resize their apps, **migrate to the cloud**, and **modernize**, AWS can help meet operational goals. We offer robust training and certifications to **upskill teams** and improve efficiency.

Following the guidance in this eBook will enable software companies to maximize the benefits of the cloud with urgency, purpose, and foresight. The end result: business transformation that helps **free up IT resources** for projects and tasks that add real value, reach milestones and benchmarks faster, and create an ever-stronger migration/modernization business case that reinforces the buy-in, enthusiasm, and commitment of everyone in an organization.

Additional resources

MODERN APPLICATIONS OVERVIEW

Build Modern Applications on AWS ›

MODERNIZATION ASSESSMENT

Modern Applications Fluency Assessment ›

EXECUTIVE SUPPORT

AWS Executive Insights ›

RE-SKILLING STAFF

AWS Migration Training ›

BUILDING AND OPERATING SOFTWARE

The Amazon Builders' Library ›

SEE WHAT WE OFFER GROWING SOFTWARE COMPANIES

AWS for Software Companies ›

GET STARTED ON YOUR MIGRATION JOURNEY

Migration Acceleration Program (MAP) ›

If you have any questions or want to talk to an expert, contact

AWS Sales ›