

Migrating to Amazon Web Services

Almost always when we talk to companies, the number one reason they choose to move to the cloud is the agility and speed that they can move with. With cloud computing, you are able to spin up thousands of servers in minutes as opposed to the 10 to 18 weeks it typically takes to spin up servers being used on-premises. The AWS Cloud provides more than 90 services - everything from compute, storage, and databases to continuous integration, data analytics, and artificial intelligence - at your fingertips. This means you can go from idea to implementation in seconds rather than months.

There are a lot of reasons why customers are migrating to the cloud. Some are migrating to the cloud to increase the productivity of their workforce. We also see a lot of companies with a data center consolidation or rationalization projects migrating to the cloud, especially those that are preparing for an acquisition, divestiture, or have otherwise experienced infrastructure sprawl over the years. Additionally, there are companies that are looking to completely re-imagine their business using modern technology as part of a larger digital transformation program. And of course, organizations are always looking for ways to improve the bottom line by reducing their costs.

Business Drivers

AWS has millions of active customers every month and every imaginable vertical business segment in the enterprise is using AWS in a meaningful way. In financial services it's Capital One, Intuit, FINRA, and Barclays. In healthcare, we have Johnson & Johnson, Merck, Pfizer, and Bristol Myers Squibb. In oil and gas there is Shell, BP, and Hess. In manufacturing, we have customers such as GE, Philips, and Schneider Electric. There is also Netflix, Samsung, Adobe, and Autodesk in technology.

Every organization will have their own unique reasons and constraints, but we have seen common drivers that customers consistently apply when migrating to the cloud:

Operational Costs

Key components of operational costs are unit price of infrastructure, the ability to match supply and demand, finding a pathway to optionality, employing an elastic cost base, and transparency.

Workforce Productivity

Typically, productivity is increased by two key factors: not having to wait for infrastructure, and having access to the breadth and depth of AWS with over 90 services at your disposal that you would otherwise have to build and maintain. In fact, it is common for us to see workforce productivity improvements of 30-50% following a large migration.

Cost Avoidance

Eliminating the need for hardware refresh programs and constant maintenance programs are the key contributors to cost avoidance. We are finding that customers have no interest in the cost and effort required to execute a big refresh cycle or data center renewal.

Operational Resilience

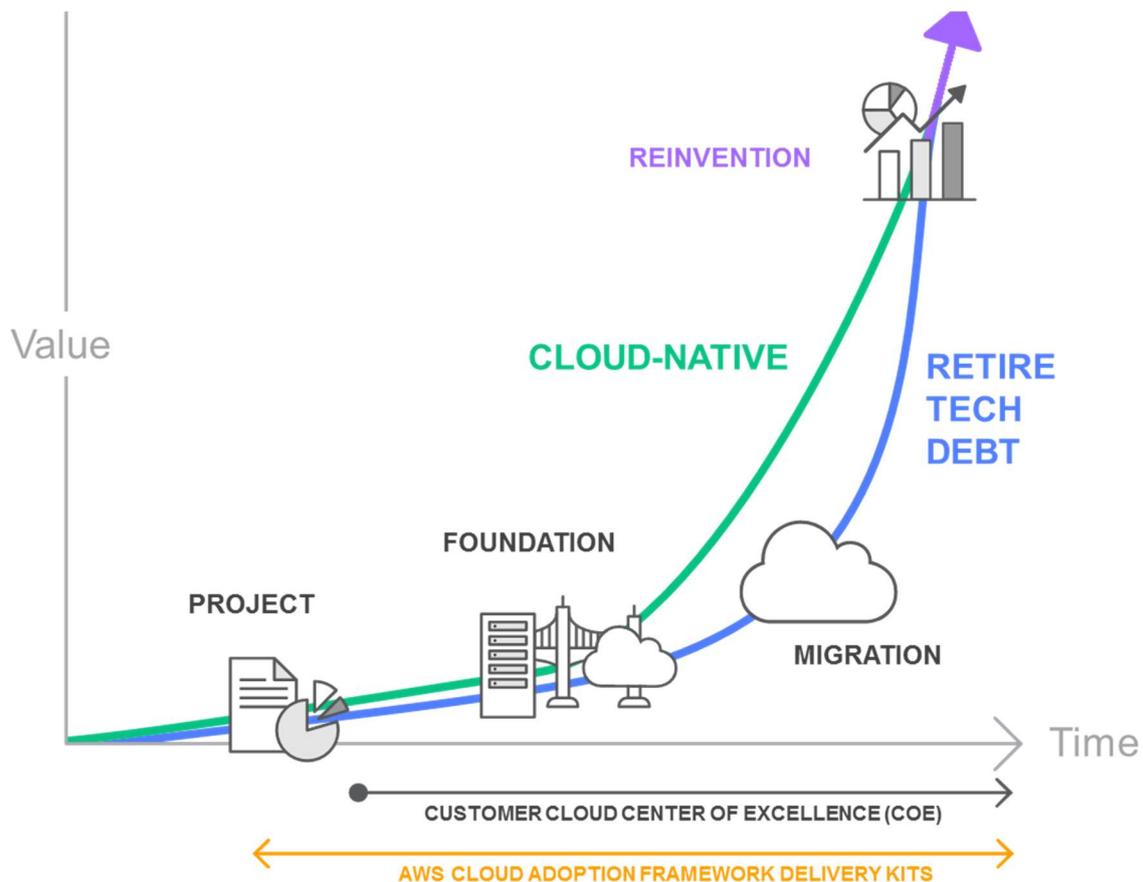
This may seem obvious, but reducing your organization's risk profile will also reduce the cost of risk mitigation. With 16 Regions comprising 42 Availability Zones (AZs), AWS has the global footprint to improve uptime, thereby reducing your risk related costs.

Business Agility

Migrating to the AWS Cloud helps increase your overall operational agility. This lets you react to market conditions more quickly through activities such as expanding into new markets, selling lines of your business, and acquiring available assets that offer a competitive advantage.

Cloud Stages of Adoption

The path to cloud adoption is unique for every enterprise. The stages of adoption described here can be a useful way to understand some of the steps involved.



A customer's journey to the cloud typically involves these four phases:

PROJECT

In the project phase, you are running projects to get familiar and experience benefits from the cloud.

FOUNDATION

After experiencing the benefits of cloud, you then build the foundation to scale your cloud adoption. This includes creating a landing zone (a pre-configured, secure, multi-account AWS environment), Cloud Center of Excellence (CCoE), operations model, as well as assuring security and compliance readiness.

MIGRATION

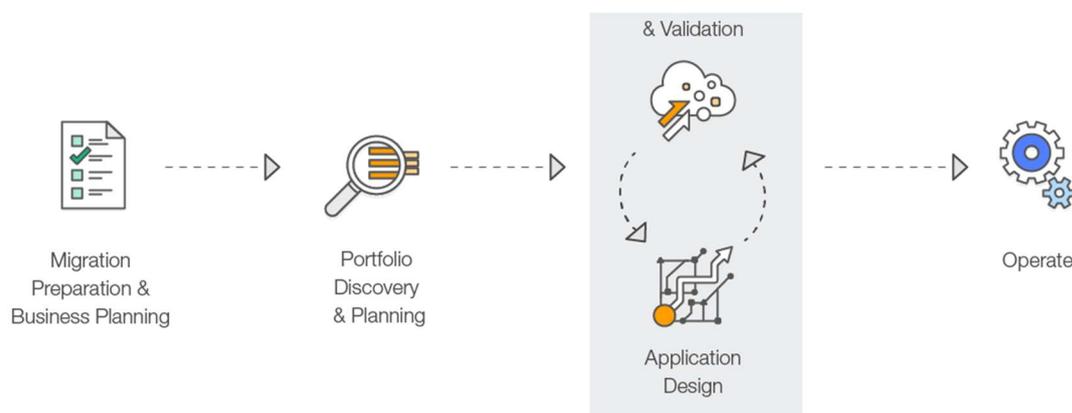
In this stage, you migrate existing applications including mission-critical applications or entire data centers to the cloud as you scale your adoption across a growing portion of your IT portfolio.

REINVENTION

Now that your operations are in the cloud, you can focus on reinvention by taking advantage of the flexibility and capabilities of AWS to transform your business by speeding time to market and increasing the attention on innovation.

The Migration Process

There may be some cases where you contemplate large legacy migrations in isolation, however, we are finding that migrations are usually part of a larger enterprise transformation effort. The patterns we have seen around migrating to the cloud commonly follow a 5-phase approach:



Phase 1: Migration Preparation and Business Planning

Here you determine the right objectives and begin to get an idea of the types of benefits you will see. It starts with some foundational experience and developing a preliminary business case for a migration. This requires taking your objectives into account, along with the age and architecture of your existing applications, and their constraints. We have partners such as RISC Networks, Atadata, Cloudamize, TSOLogic, and Apptio that have experience in this area.

Phase 2: Portfolio Discovery and Planning

Next, you need to understand your IT portfolio, the dependencies between applications, and begin to consider what types of migration strategies you will need to employ to meet your business case objectives. With the portfolio discovery and migration approach, you are in a good position to build a full business case. If you need help with understanding your IT portfolio, you can work with partners such as RISC Networks, Cloudamize, and Atadata as well as use [AWS Application Discovery Service](#).

Phase 3 & Phase 4: Designing, Migrating, and Validating Application

Here the focus moves from the portfolio level to the individual application level and you design, migrate, and validate each application. Each application is designed, migrated, and validated according to one of the six common application strategies ([“The 6 R’s”](#)). Once you have some foundational experience from migrating a few apps and a plan in place that the organization can get behind - it’s time to accelerate the migration and achieve scale. Partners such as Cloudendure, CloudVelox, Atadata, Racemi, and Attuinity can help you here as well as [AWS Server Migration Service \(SMS\)](#) and [AWS Database Migration Service \(DMS\)](#).

Phase 5: Operate

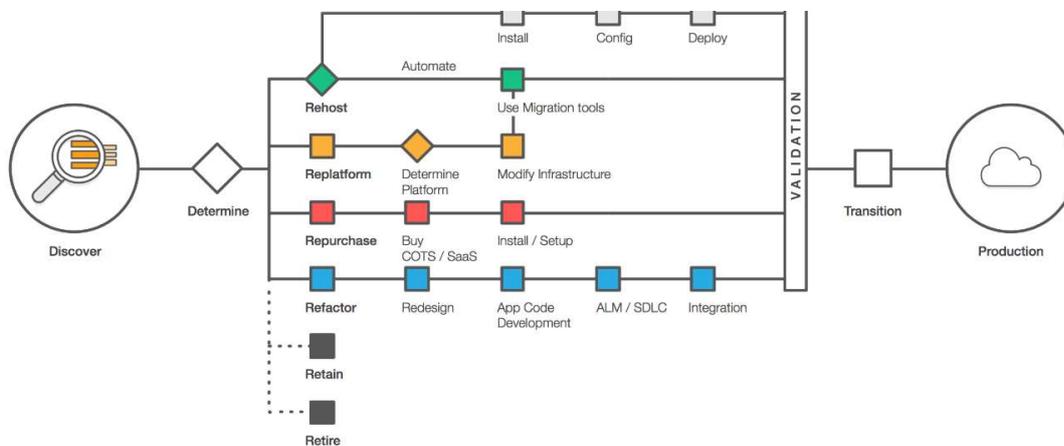
As applications are migrated, you iterate on your new foundation, turn off old systems, and constantly iterate toward a modern operating model. Your operating model becomes an evergreen set of people, process, and technology that constantly improves as you migrate more applications. We have partners such as AppDynamics, NewRelic, and Dynatrace that can help you continue to iterate on your operating model as you move more to the cloud.

Six Common Application Migration Strategies

Organizations usually begin to think about how they will migrate an application during [Phase 2](#) of the migration process. This is when you determine what is in your environment and the migration strategy for each application. The six approaches detailed below are common migration strategies employed and build upon “The 5 R’s” that Gartner outlined in 2011.

You should gain a thorough understanding of which migration strategy will be best suited for certain portions of your portfolio. It is also important to

consider that while one of the six strategies may be best for migrating certain applications in a given portfolio, another strategy might work better for moving different applications in the same portfolio.



1. Rehost (“lift and shift”)

In a large legacy migration scenario where the organization is looking to quickly implement its migration and scale to meet a business case, we find that the majority of applications are rehosted. Most rehosting can be automated with tools such as [AWS SMS](#) although you may prefer to do this manually as you learn how to apply your legacy systems to the cloud.

You may also find that applications are easier to re-architect once they are already running in the cloud. This happens partly because your organization will have developed better skills to do so and partly because the hard part - migrating the application, data, and traffic - has already been accomplished.

2. Replatform (“lift, tinker and shift”)

This entails making a few cloud optimizations in order to achieve some tangible benefit without changing the core architecture of the application. For example, you may be looking to reduce the amount of time you spend managing database instances by migrating to a managed relational database service such as [Amazon Relational Database Service \(RDS\)](#), or migrating your application to a fully managed platform like [AWS Elastic Beanstalk](#).

3. Repurchase (“drop and shop”)

This is a decision to move to a different product and likely means your organization is willing to change the existing licensing model you have been using. For workloads that can easily be upgraded to newer versions, this strategy might allow a feature set upgrade and smoother implementation.

4. Refactor / Re-architect

Typically, this is driven by a strong business need to add features, scale, or performance that would otherwise be difficult to achieve in the application’s existing environment. If your organization is looking to boost agility or improve business continuity by moving to a service-oriented architecture (SOA) this strategy may be worth pursuing - even though it is often the most expensive solution.

5. Retire

Identifying IT assets that are no longer useful and can be turned off will help boost your business case and direct your attention towards maintaining the resources that are widely used.

6. Retain

You may want to retain portions of your IT portfolio because there are some applications that you are not ready to migrate and feel more comfortable keeping them on-premises, or you are not ready to prioritize an application that was recently upgraded and then make changes to it again.

AWS Migration Tools and Services

There are a number of tools to help you automate the migration of your applications:

Discovery and Migration Tracking

AWS Migration Hub

[AWS Migration Hub](#) provides a single location to track the progress of application migrations across multiple AWS and partner solutions. Using Migration Hub allows you to choose the AWS and partner migration tools that best fit your needs, while providing visibility into the status of

migrations across your portfolio of applications. Migration Hub also provides key metrics and progress for individual applications, regardless of which tools are being used to migrate them.

AWS Application Discovery Service

[AWS Application Discovery Service](#) helps you plan migration projects by gathering information about their on-premises data centers. Planning data center migrations can involve thousands of workloads that are often deeply interdependent. AWS Application Discovery Service collects and presents configuration, usage, and behavior data from your servers to help you better understand your workloads.

Server & Database Migration

AWS Server Migration Service

[AWS Server Migration Service \(SMS\)](#) is an agentless service which makes it easier and faster for you to migrate thousands of on-premises workloads to AWS. AWS SMS allows you to automate, schedule, and track incremental replications of live server volumes, making it easier for you to coordinate large-scale server migrations.

AWS Database Migration Service

[AWS Database Migration Service \(DMS\)](#) helps you migrate databases to AWS easily and securely. The source database remains fully operational during the migration, minimizing downtime to applications that rely on the database. The AWS Database Migration Service can migrate your data to and from most widely used commercial and open-source databases.

VMware Cloud on AWS

Currently in Technology Preview, [VMware Cloud on AWS](#) will be a new solution that makes it easy for customers to run VMware workloads on the AWS Cloud. Customers will be able to use VMware's virtualization and management software to seamlessly deploy and manage VMware workloads across all of their on-premises and AWS environments. This new offering will allow customers to leverage their existing investments in VMware skillsets and tooling to quickly and seamlessly take advantage of the flexibility and economics of the AWS Cloud.

Data Migration

Amazon S3 Transfer Acceleration

[Amazon S3 Transfer Acceleration](#) makes public Internet transfers to Amazon S3 faster. You can maximize your available bandwidth regardless of distance or varying Internet weather, and there are no special clients or proprietary network protocols. Simply change the endpoint you use with your S3 bucket and acceleration is automatically applied.

AWS Snowball

[AWS Snowball](#) is a petabyte-scale data transport solution that uses secure appliances to transfer large amounts of data into and out of AWS. Using Snowball addresses common challenges with large-scale data transfers including high network costs, long transfer times, and security concerns.

AWS Snowmobile

[AWS Snowmobile](#) is an exabyte-scale data transfer service used to move extremely large amounts of data to AWS. You can transfer up to 100PB per Snowmobile, a 45-foot long ruggedized shipping container, pulled by a semi-trailer truck. Snowmobile makes it easy to move massive volumes of data to the cloud, including video libraries, image repositories, or even a complete data center migration.

AWS Direct Connect

[AWS Direct Connect](#) lets you establish a dedicated network connection between your network and one of the AWS Direct Connect locations. Using industry standard 802.1q VLANs, this dedicated connection can be partitioned into multiple virtual interfaces. This allows you to use the same connection to access public resources such as objects stored in Amazon S3 using public IP address space, and private resources such as Amazon EC2 instances running within an Amazon Virtual Private Cloud (VPC) using private IP space, while maintaining network separation between the public and private environments. Virtual interfaces can be reconfigured at any time to meet your changing needs.

Amazon Kinesis Firehose

[Amazon Kinesis Firehose](#) is the easiest way to load streaming data into AWS. It can capture and automatically load streaming data into Amazon S3 and Amazon Redshift, enabling near real-time analytics with existing business intelligence tools and dashboards you're already using today. It is a fully managed service that automatically scales to match the throughput of your data and requires no ongoing administration. It can also batch, compress, and encrypt the data before loading it, minimizing the amount of storage used at the destination and increasing security. You can easily create a Firehose delivery stream from the AWS Management Console, configure it with a few clicks, and start sending data to the stream from hundreds of thousands of data sources to be loaded continuously to AWS – all in just a few minutes.

AWS Marketplace

Some large companies are moving a portfolio of 2,000 applications with upwards of 600 vendors included. During this process, companies spend countless hours, weeks, and months pouring over contracts and assessing rights to move current software.

AWS Marketplace allows customers to select from more than 3,500 software listings offered by over 1,100 of our technology partners to make migrations faster and easier. Marketplace has over 400 bring your own license (BYOL) offers which enable fast provisioning and metered deployment of products customers may already own in areas like Security, Network, Storage, BI and Database, to name a few.

Resources

AWS Migration Acceleration Program (MAP)

The AWS Migration Acceleration Program (MAP) is designed to help enterprises that are committed to a migration journey achieve a range of these business benefits by migrating existing workloads to Amazon Web Services. It includes a migration methodology for executing legacy migrations in a methodical way as well as robust set of tools to automate and accelerate common migration scenarios.

AWS Cloud Adoption Framework (AWS CAF)

We have taken the in-depth learnings from our numerous customer engagements and established the [AWS Cloud Adoption Framework \(AWS CAF\)](#) to help organizations develop an efficient and effective plan for their cloud adoption journey. Guidance and best-practices prescribed within the framework can help companies build a comprehensive approach to cloud computing across your organization, throughout your IT lifecycle. At the highest level, the AWS CAF organizes guidance into six focus areas. We describe these focus areas as Perspectives.

In general, the Business, People, and Governance Perspectives focus on business capabilities, and the Platform, Security, and Operations Perspectives focus on technical capabilities. By identifying the gaps in skills and processes between the current IT environment and the future cloud environment an organization can create an action plan designed to close these gaps.

Partner Ecosystem

Enterprises migrating to AWS require expertise, tools, and alignment of business and IT strategy. Many organizations can accelerate their migration, and their time to results, through working with partners. The AWS Partner Competency Program validates partners that have demonstrated they can help customers utilize AWS services.

AWS Migration Competency Partners provide solutions or have deep experience helping businesses move applications and legacy infrastructure to AWS, through all aspects of complex migration projects including discovery, planning, migration and operations.

AWS Professional Services

The AWS Professional Services team has in-depth understanding of what it means to move to the cloud and have helped hundreds of enterprise customers and government institutions achieve their business goals at every stage of AWS adoption. Operating in 20 countries, they have the global scale and industry expertise to support your organization.

eBook: Migrating to AWS

While there are several common components found in each successful migration, there is no one-size-fits-all solution to deciding on the best approach. We have gained experience helping organizations move their IT portfolios to the cloud, and developed an eBook with best-practices and strategies that many customers have found useful.

[Download the Migrating to AWS eBook »](#)

AWS Enterprise Collections Blog

The AWS Enterprise Collections blog is a series of articles related to enterprise adoption of cloud computing. These articles include best practices, recommendations, and first-hand accounts from AWS leaders and AWS customers about their cloud computing experiences.

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