AWS Cloud Migration Readiness Guide

A Methodology for Migration Readiness
& Cloud Adoption

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Overview

Adopting cloud services provides many benefits, such as increased business agility, improved flexibility, and reduced costs. As an organization's cloud journey evolves from building and running programs that are designed specifically for a cloud computing architecture to mapping out the migration of their entire IT operations to the cloud, unique migration challenges surface.

In addition to real and perceived security barriers and long migration timelines, the lack of broad stakeholder buy-in and the absence of a clearly defined strategy often prevents organizations from taking advantage of widespread cloud adoption. Large-scale migrations require upfront business planning and a degree of business transformation before delivering the full value of operating in the cloud.

This guide walks you through what it means to be ready to migrate and how to establish a foundation to save time and prevent roadblocks. It discusses the importance of driving organizational change and establishing foundational readiness planning, presents an iterative approach to migration, and also provides you with resources to enhance your organization's skills to help maximize results.

Introduction

There are many reasons why education institutions and other organizations are migrating to the cloud. Some are looking to increase the productivity and efficiency of their teams. Others are looking to consolidate data centers, minimize costly infrastructure sprawl, and modernize legacy applications that have lost value over time. Still others are re-imagining their missions by upgrading to cloud-hosted technologies that drive digital transformation.

This modernization process reveals cost reduction opportunities and facilitates growth opportunities. The demand for cloud IT is driven by mandates to lower IT costs, gain greater availability of secure cloud solutions, and gain faster data insights. Cloud helps organizations to empower accurate decision-making, protect from data loss, and focus on better serving citizens.

Business Drivers

Each organization will have its own reasons for moving to the cloud, however, there are some common migration drivers:

Cost Avoidance

Eliminating the need for hardware refresh programs and constant maintenance programs are key contributors to cost avoidance. We find that organizations are looking to mitigate and/or eliminate the cost and effort required to execute a big refresh cycle or data center renewal.

Reduced Operational Costs

In addition to eliminating capital expenditures, cloud deployments also help reduce operational costs by automating tactical activities. According to the Federal CIO Survey, Federal CIOs indicated they spend 73% of their budget on operations and maintenance versus activities focused on innovation. Cloud deployments help minimize the amount of time and money spent on lesser value-added deliverables and allow IT resources to shift onto projects that drive the organization forward, such as implementing new technologies or improving the analysis of data.

Increased Workforce Productivity

Cloud adoption drives workforce productivity in multiple ways. End users no longer have to wait for IT infrastructure to be ready, as hardware is no longer purchased, provisioned, and patched through lengthy procurement processes. IT buyers and users have access to the entire AWS cloud portfolio on-demand, without building data centers or maintaining hardware.

Improved Operational Resilience

By supporting disaster recovery and resiliency plans in the cloud, an organization can immediately reduce its risk profile and risk mitigation costs. AWS cloud computing resources are hosted in multiple locations worldwide. These locations are composed of AWS Regions and Availability Zones. Each AWS Region is a separate geographic area. Each AWS Region has multiple, isolated locations known as Availability Zones. As an example, Amazon Relational Database Service (RDS) provides you with the ability to place resources, such as instances, and data in multiple locations. Resources aren't replicated across AWS Regions unless you do so specifically. AWS has the global footprint to improve uptime, thereby reducing your risk-related costs. The AWS Cloud spans 55 Availability Zones within 18 geographic regions and one local region around the world, with announced plans for 12 more Availability Zones and four more regions in Bahrain, Hong Kong SAR, Sweden, and a second AWS GovCloud (US) Region.

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Business Agility

Migrating to the AWS Cloud helps increase your overall operational agility, letting you respond to market conditions more quickly through activities such as instant access to infrastructure and data insights. This empowers organizations to make business decisions in real time.

Customer Migration Readiness Challenges

Although the reasons for moving to the cloud are compelling, there are a variety of common challenges impacting large-scale cloud migration.

First, many organizations inadvertently forget to include cloud stakeholders on their cross-functional teams, even after an internal business case for cloud adoption has been approved by their CIO. Cross-functional leads can include cloud architects, IT leads, application developers, DBAs, legal leads, financial leads, and respective executive sponsors. For these individuals, cloud adoption concerns include costs, legal obligations, data security, application performance, business continuity needs, integration and support for proposed cloud services, and the impact on legacy systems.

In addition, many organizations lack internal communication tools to help facilitate full immersion into the cloud migration process. For a cohesive approach to cloud adoption, IT stakeholders leading migrations should make themselves available.

Finally, many organizations lack formal content and project management tools to maintain project timelines and document new learnings, processes, and best practices. Poor documentation negatively impacts cloud projects, since migrations happen in phases and this documentation forms the basis for future automation and makes cloud migrations repeatable.

Several, diverse, stake holders

Lack of team coordination, communication and availability across teams

Lack of content and project management tools

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AWS Cloud Adoption Framework

Developing and executing a cloud transformation can be intimidating even to experienced IIT leaders. And while each organization has its own desired outcome, some cloud-related goals are universal. To help identify common cloud migration activities and best practices that organizations can use to optimize their migrations and cloud adoption outcomes, AWS has created the AWS Cloud Adoption Framework (CAF). The CAF is organized into common perspectives, focus areas, and building blocks, and is adaptable to your specific needs and goals.

Creating an AWS CAF Action Plan will help an organization prepare for the transition to cloud-based IT. The first step is for your organization's leadership team to review the CAF perspectives. Each perspective is used to create work streams that reflect gaps in your existing skills and processes. These gaps are recorded as inputs, and serve as the basis for creating the CAF Action plan, which will guide your organization's cloud migration

AWS Cloud Adoption Framework

Perspective	Area of Focus
Business	Business support capabilities to optimize business value with cloud adoption. Common Roles: Business Managers; Finance Managers; Budget Owners; Strategy Stakeholders
People	People development, training, communications, and change management. Common Roles: Human Resources; Staffing; People Managers.
Governance	Managing and measuring resulting business outcomes. Common Roles: CIO; Program Managers; Project Managers; Enterprise Architects; Business Analysts; Portfolio Managers.
Platform	Develop, maintain, and optimize cloud soutions and services. Common Roles: CTO; IT Managers; Solution Architects.
Operations	Allows system health and reliability through the move to the cloud, and delivers an agile cloud computing operation. Common Roles: IT Operations Managers; IT Support Managers.
Security	Ensures that the workloads deployed or developed in the cloud align to the organization's security control, resiliency, and compliance requirements. Common Roles: CISO; IT Security Managers; IT Security Analysts; Head of Audit and Compliance.

Drafting Your Business Case

After creating your CAF Action Plan, it's time to add depth to key sections. First, you need to focus on your business case in order to gain support from all key stakeholders. Return on investment (ROI) calculations typically define the payback of investments against the benefits to the organization using financial terms and variables that are fairly static. These calculations fall short when used in the more complex, constantly evolving world of cloud computing. Deployment models vary, options change frequently and can break traditional ROI models, leaving potential benefits unaccounted for. Benefits extend beyond IT, changing the way functional areas conduct and approach business.

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Understanding your current IT environment costs – the total cost of ownership of the systems and applications you are considering moving to the cloud – is critical to estimating the potential return. The elements discussed below provide the starting point for this analysis. To establish the baseline costs of your organization's IT environment, we recommend looking at four key areas: data center infrastructure, labor, licensing, and training, and then begin assigning costs to each sub-segment.

Key Cost Elements for Evaluation

Data Center Infrastruture	Labor	Licensing	Training
Server Hardware	Application Management	Operation System	Application
Network Hardware	Database Management	Database	Database
Hardware and Network Maintenance	Operation System Administration	Virtualization	Operation System
Hardware Power	Server Administration	Security Software	Network
Power for HVAC/Utilities	Support	Management Software	Infrastructure
Primary Data Storage	Security Monitoring		Security
Data Backup and Retention	Maintenance and Disaster Recovery		
Infrastructure Costs Such as Load Balancers, Firewalls, Routers/Switches, Data Replication Appliances, etc.	Consulting Labor for Projects such as Technology Refresh		
System Security and Monitoring Equipment			
Other Facility Cost—Rent, Insurance, etc.			

To quantify the benefits of a technology environment – whether on-site or in the cloud, we recommend examining the benefits that your technology investments deliver through two specific perspectives.

1. **Total cost reduction:** This is closely linked to total cost of ownership (TCO). You can lower your total cost of ownership by reducing what the organization is spending on IT today, as well as repurposing existing investments. The next question to ask is: by adopting cloud services, which infrastructure, licensing, labor, and training costs can you trim or eliminate altogether? Assigning a monetary value to these costs is relatively straightforward once you've identified the cost elements of each.

2. **Cost avoidance/value-added benefits:** This second lens is critical to understanding the full benefit derived from moving to the cloud. You can avoid costs and gain value-added benefits by examining how the solution can enhance normal operating capabilities your organization has today or plans to add in the future.

There are a number of value-added benefits you'll gain from moving to the cloud:

1. **The value of reduced downtime:** To calculate, you must look at more than the number of hours the application is unavailable. Instead, you should also evaluate the number of total application users, concurrent application users, average hourly compensation, and the percentage of downtime that affects those users over the course of year. With this information, you can arrive at a dollar figure for lost productivity due to downtime.

2. **The value of improved performance:** Taking into consideration the number of users and associated labor costs, measure those costs against application requests per user per hour (to calculate how many times per hour a user is affected by slow performance) and system latency (to calculate cumulative latency per hour per user). With this information, you can arrive at a dollar figure for lost productivity due to poor performance.

3. **The value of fewer security incidents or data losses:** Even one security breach can have a significant effect on your organization's reputation and financial health. You can measure this by calculating an average incident cost per user record and multiplying that by the probability of a security incident.

4. **The value of application currency:** Application currency is the on-going process of determining how current an application is compared to the latest available version as well as understanding the supported and certified operating system platforms. While maintenance costs for on-premises enterprise applications are significant, those maintenance dollars do provide value—upgrades, updates, patches, support, and more. As you calculate the value of application currency, also remember to look at the speed at which new upgrades and updates can be applied. Improved currency means fewer institutional resources involved in lengthy and cumbersome upgrades.

5. **The value of more efficient backups:** To calculate this value, use the number of users and associated labor costs, and evaluate those numbers against hours of lost work due to inefficient backups.

6. **The value of better disaster recovery:** The number of users, associated labor costs, and probability of a disaster in a given year are taken into the calculation. You can also look at metrics such as time to recovery and cost per disaster due to lost productivity.

AWS also provides a variety of tools to help create your business case for migration. The AWS Simple Monthly Calculator provides directional business case inputs, while the AWS Total Cost of Operation (TCO) calculator supports your refined business case. Additionally, AWS has tools that help with cost estimation and the total cost of migration.

People and Organization

It is important to develop a critical mass of people with AWS experience in production environments as you prepare for a larger migration. It is a cloud best practice to establish operational processes and form a Cloud Center of Excellence (CCoE) dedicated to mobilizing appropriate resources. The CCoE will lead your organization through transformations over the course of the migration effort, and a CCoE institutionalizes best practices, governance standards, and the use of automation. When done well, a CCoE inspires a cultural shift towards innovating and a 'change is normal' mindset.

An effective CCoE team evolves over time in size, makeup, function, and purpose. Long-term and short-term objectives, as well as key operating model decisions, will require adjustments to your team. In the early stages of cloud adoption, team development begins as a small, informal group connected by a shared interest, for example, experimentation with cloud implementation. As your cloud initiative grows and the need for a more formalized structure increases, it becomes beneficial to establish a CCoE dedicated to evangelizing the value of the cloud.

While the CCoE establishes best practices, methods, and governance for your evolving technology operations, additional cloud execution teams will also form. These smaller teams migrate candidate applications and application groupings, commonly referred to as migration waves, to your cloud environment. The CCoE directs the operating parameters of your migration teams. Lessons are learned and documented collectively, improving efficiency and confidence through hands-on experience.

Migration Readiness and Planning

Migration Readiness and Planning (MRP) is a method that consists of tools, processes, and best practices that prepare an organization for cloud migration. During the Migration Readiness and Planning (MRP) phase, you build the foundation for a large-scale migration and gain experience migrating and operating several workloads on AWS.

To prepare a cloud operational foundation, you should follow an agile approach with work streams for cloud center of excellence, landing zone, operation model, and security and compliance. You should develop a strong migration plan and a compelling business case that articulates the total cost of ownership (TCO) and return on investment (ROI) for a cloud migration. At the end of this phase, which is usually completed in 2-4 months, you will be ready to migrate at scale. The MRP method aligns to the AWS Cloud Adoption Framework and is execution-driven. Here are some key MRP questions to consider:

- Have you clearly defined the scope and the business case for the migration?
- Have you evaluated the environment and applications in scope through the lenses of the AWS CAF?
- Is your virtual private cloud (VPC) secure, and can it act as a landing zone for all applications in scope? A VPC is a virtual network dedicated to your AWS account. It is logically isolated from other virtual networks in the AWS Cloud. You can launch your AWS resources, such as Amazon EC2 instances, into your VPC.
- Have your operations and employee skills been reviewed and updated to accommodate the change?
- Do you (or does a partner) have the experience necessary to move the tech-stacks that are in scope?

AWS has developed a tool known as CART (Cloud Adoption Readiness Tool) to help you assess your organization's current migration readiness state in each of the AWS CAF perspectives. This assessment identifies readiness gaps and makes recommendations to fill gaps in information and preparation for a large migration effort. Using CART is a great way to get started with your migration journey.

CART is completed interactively in a cross-group setting involving key stakeholders across your IT organization, building a common view of your current state. You may have representatives from IT Leadership, Networking, Operations, Security, Risk and Compliance, Application Development, Enterprise Architecture, and your CCoE or Cloud Business Office (CBO) respond to the questions.

There are a total of 16 questions that take less than 30 minutes to complete, and at the end of the assessment, you can download a report that rates your cloud adoption readiness across the areas of the Cloud Adoption Framework.   The report will feature recommendations and actions to take to help advance your unique cloud migration journey and prepare your business case.

Summary of Your Cloud Adoption Readiness Scores

The chart below shows your organization's cloud readiness scores across the six AWS Cloud Adoption Framework (CAF) perspectives, based on the answers you provided for survey questions. Learn more about CAF.

Green: Scores in green indicate that you met the levels of readiness commonly found with successful AWS migrations.

Yellow: Scores in yellow indicate that additional prep-work is recommended. Additional resources to help address areas for improvement are provided in this report.
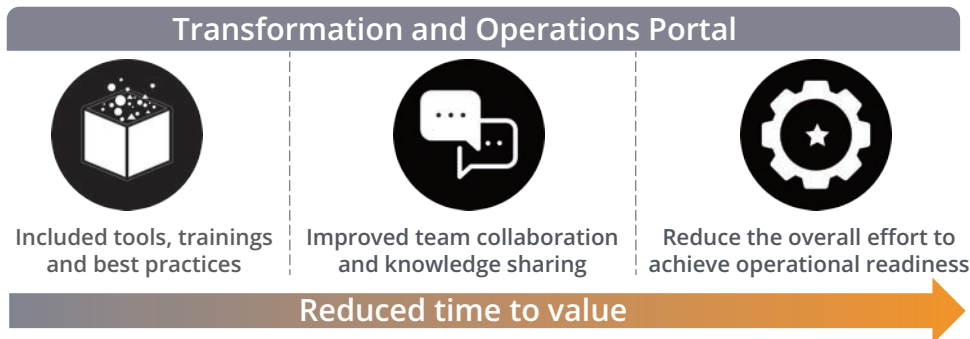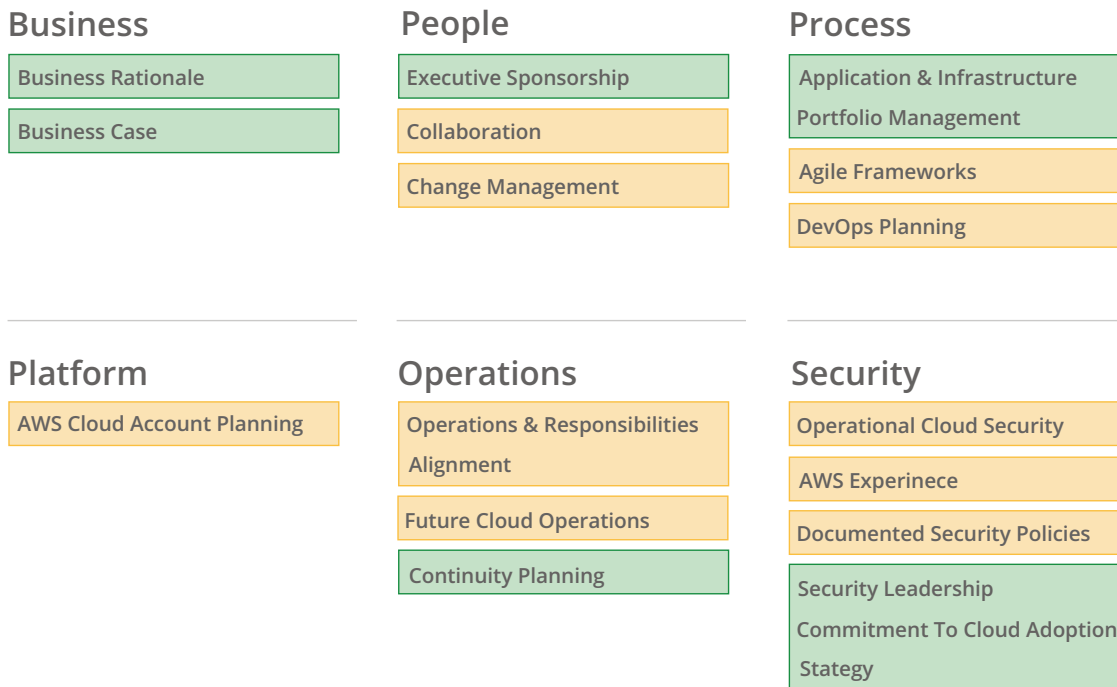
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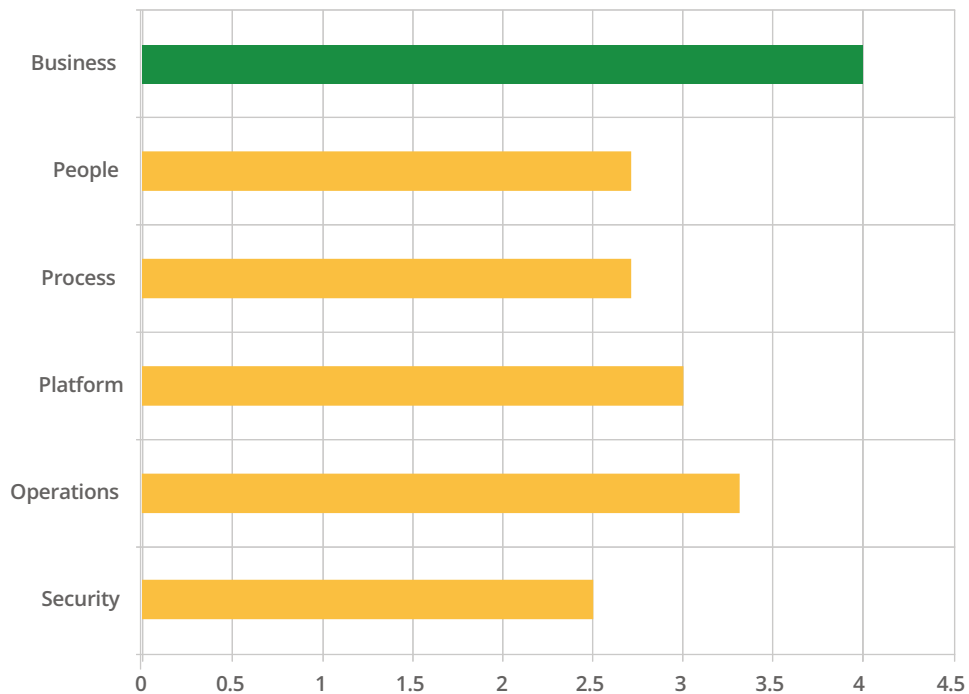
Cloud Readiness Heatmap

In this section, you will find CART assessment scores shown in a heatmap across the six CAF perspectives. Learn more about CAF.

Green: Questions and Sections that are green indicate a high level of cloud adoption readiness.

Yellow: Questions and Sections that are yellow indicate that additional prep-work is recommended. Additional resources to help address areas for improvement are provided in this report.

Benefits from improved operational readiness

Business

Business Rationale
Business Case

People

Executive Sponsorship
Collaboration
Change Management

Process

Application & Infrastructure Portfolio Management
Agile Frameworks
DevOps Planning

Platform

AWS Cloud Account Planning

Operations

Operations & Responsibilities Alignment
Future Cloud Operations
Continuity Planning

Security

Operational Cloud Security
AWS Experinece
Documented Security Policies
Security Leadership Commitment To Cloud Adoption Stategy

Transformation and Operations Portal

Included tools, trainings and best practices

Improved team collaboration and knowledge sharing

Reduce the overall effort to achieve operational readiness

Reduced time to value

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Conclusion

Many organizations are moving their applications to the AWS Cloud in order to simplify infrastructure management, modernize services, improve service availability, increase agility, and innovate faster at a lower cost. Having a clear understanding of existing infrastructure costs and the details of your unique migration use case will help you calculate payback time and projected ROI.

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A Cloud Migration Enablement Partner

Unicon, Inc. is an Amazon Partner Network Advanced Consulting Partner with extensive domain expertise in education. We have achieved the AWS Education Competency, and are a member of the Public Sector Partner program. Through our experiences, we are uniquely positioned to address the needs of both education and EdTech partners and deliver a mature set of cloud services designed for the unique security, compliance, privacy, and governance requirements of large organizations.

Unicon offers hosting on the AWS Cloud for regional and global users as well as design and migration for cloud-delivered IT services. We also offer a JumpStart for AWS program designed to help you establish a strong AWS foundation. We have been hosting organizations in the cloud since 2009 and are well-positioned to help you realize the benefits of the cloud. For more information, contact Unicon through our website at Unicon.net

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