
AWS Prescriptive Guidance

Mobilize your organization to accelerate large-scale migrations



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Mobilize your organization to accelerate large-scale migrations

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Home

Migrating hundreds or thousands of workloads requires coordination and implementation across multiple disciplines and teams. AWS approaches large-scale migrations in three phases: assess, mobilize, and migrate. Each phase builds on the previous one. This AWS Prescriptive Guidance strategy covers the assess phase and the mobilize phase. These phases set the foundation for accelerated migration at scale during the migrations phase.

This migration strategy includes methods and best practices for the following:

- Mobilizing your workforce and resources
- Establishing automation to migrate applications with an agile approach
- Migrating these assets to the AWS Cloud

This approach is based on the AWS Professional Services team's years of experience helping enterprise AWS customers mobilize for cloud adoption and migration.

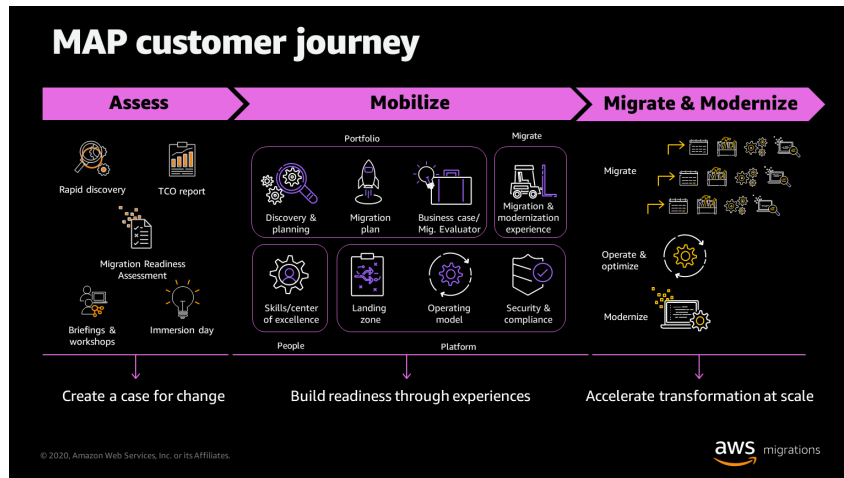
This strategy is for anyone planning to migrate their on-premises workloads to the AWS Cloud: IT and business executives, program and project managers, product owners, and operations and infrastructure managers. It discusses how you can accelerate your cloud adoption, create a migration plan, set up a foundation through hands-on experience, and migrate your first set of applications to the AWS Cloud in weeks.

Overview

To optimize your cloud adoption and migration, you must first assess and evaluate your enterprise for readiness. After you assess the readiness of your organization, you can accelerate your cloud adoption and establish a foundation for migration at scale through the hands-on experience of

migrating a first wave of applications in just a few weeks. We discuss these phases in more detail in the following topics.

The iterative approach to cloud adoption discussed in this guide can be broken out into the three highlevel phases of assess, mobilize, and migrate. These phases are shown in the following diagram.



Assess

The first phase of a cloud migration begins with a cloud readiness assessment of your enterprise’s current state. These assessment tasks give you a clear picture of what you will migrate, as well as a business case for migration and total cost of ownership (TCO) analysis for migration.

A Migration Readiness Assessment (MRA) is a process that provides you with the following:

- An understanding about how far along your enterprise is in the cloud journey
- An understanding of your current strengths and weaknesses in relation to a cloud-ready enterprise
- An action plan to close identified gaps

This assessment is based on the AWS Cloud Adoption Framework (AWS CAF) and its six perspectives: business, people, governance, platform, security, and operations. Using this framework during the assessment phase helps ensure that you have a holistic view of the transformation initiative that will support an effective move to the cloud.

The assess phase includes a rapid discovery process with high-level TCO assessment in addition to the MRA. These steps will be useful as you progress towards obtaining stakeholder commitment and funding for the larger initiatives that follow.

For more information, see [Assess phase](#).

Mobilize

With a strong understanding of your current state and your portfolio along with the solid business case, you develop in the assessment phase, you can demonstrate the value of the cloud to your organization.

The goal of the mobilize phase is to build foundational capability both in the organization and with the

AWS environment with hands-on migration experience focused on security and operations automation. This process brings together your portfolio of tools and practices in a scalable and secure AWS landing zone. In this phase, you migrate a small set of business applications to the cloud, while enforcing an agile and scalable delivery culture, team structure, and change management process.

The AWS mobilize approach includes a defined set of activities across eight distinct workstreams:

- Detailed business case
- Detailed portfolio discovery
- Application migration
- Migration governance
- AWS landing zone
- Security, risk, and compliance
- Operations
- People: skills, culture, change, and leadership

With this approach, activities under these workstreams are delivered across eight two-week sprints.

Mobilize delivers the following outcomes:

- Improve your IT staff's skill and competency for migration and organizational transformation by building confidence with methodology, processes, and tooling
- Define and automate security, risk, and compliance policies to accommodate operational controls
- Define and implement an AWS landing zone that can scale as you migrate additional applications
- Establish your cloud operating model
- Run applications in production capacity

Migration during the mobilize phase is an iterative process that evolves as your organization develops new skills, tools, and capabilities. These skills and capabilities build momentum and accelerate your migration efforts over time. Establishing the right foundation to build on is key to a successful migration. The AWS migration framework balances the business and technical efforts needed to complete a cloud migration. This model helps you identify key business drivers for migration and the best strategies for planning and implementing a successful cloud migration.

For more information, see [Mobilize phase](#).

Migrate

The migrate phase uses the patterns, processes, tools, resources, and methodology defined and tested during the mobilize phase to migrate applications at scale. After using the best practices and lessons learned from the earlier phases, you can implement a migration factory, a blueprint of scaling implementation and operations, through automation and agile delivery.

Migrate

For more information, see [Migrate phase](#).

Assess phase

In order to mobilize your workforce and resources to migrate your enterprise at scale, you must first assess your readiness and inventory your portfolio. These steps enable you to build a business case with right key performance indicators (KPIs) and metrics and to align key stakeholders and

leadership on business goals. You will run the Migration Readiness Assessment (MRA) workstream during this phase.

Migration Readiness Assessment (MRA)

MRA is an AWS process of gaining insights about your enterprise's current cloud readiness and building an action plan to close identified gaps, using the AWS Cloud Adoption Framework (AWS CAF).

Objective

- Assess and evaluate your enterprise's readiness by answering questions based on the six AWS CAF perspectives

Outcomes

- Understanding where your enterprise is in your cloud journey
- Identification of areas of strength and weakness
- Plan to fill the identified gaps

How-to guide

[Evaluating migration readiness](#)

Mobilize phase

The next step in preparing your workforce and resources to migrate your enterprise at scale is to break down the mobilize activities into different workstreams. Although the goal of the mobilize phase is the migration of business applications, this phase also provides an opportunity to lay the foundation for tooling, process, and culture that will accelerate your migration at scale. Most of these workstreams can run in parallel after the assessment phase is complete. The following workstreams should be run during this phase:

- Detailed business case
- Detailed portfolio discovery
- Application migration

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- Migration governance
 - Landing zone
 - Security, risk, and compliance
 - Operations
 - People: skills, culture, change, and leadership

These are discussed in detail in the following sections.

Detailed business case

A detailed, multi-year business migration case that includes current on-premises costs, new AWS costs, and migration costs helps align stakeholders and executives.

Objectives

- Determine migration costs
- Estimate how much you can save by migrating to AWS
- Estimate other business benefits of migrating
- Determine the length of the target migration
- Determine which workloads you will migrate and in which year
- Input the detailed inventory for each workload

Outcomes

- Multi-year migration business case
- Migration costs

AWS Partners such as RISC Networks, Deloitte, Cloudamize, TSO Logic, and Apptio have tools and experience in this area.

Detailed portfolio discovery

This is where you start to pull the pieces together and develop a strategy for migration. At this stage, you want to consider where your cloud journey fits into your organization's larger business strategy and find opportunities for alignment of vision. A well-aligned migration strategy with a supporting business case and a thorough application migration plan sets the proper groundwork for cloud adoption success.

A critical aspect of your migration strategy is the collection of application portfolio data and rationalization of this data against the seven Rs of migration: rehost, replatform, refactor /rearchitect, repurchase, relocate, retire, and retain. You build a migration wave plan by using the seven Rs to categorize what is in your environment. Next, blend those categories with information about interdependencies, technical complexity to migrate, and how you will migrate each application or set of applications. After you analyze your applications according to the seven Rs, you can outline a migration plan for each application in your portfolio. This is an iterative plan that will mature as you progress through the migration, build confidence, learn new capabilities, and better understand your existing estate.

Objectives

- Develop a prioritized list of migration groups, including applications and associated infrastructure, for all in-scope applications
- Define the necessary business and infrastructure data elements, and recommend data collection tools
- Work with business and IT leadership teams to define migration drivers and ultimately the portfolio plan
- Create a high-fidelity migration plan for the application portfolio that includes the following activities:
 - Discover current state environment, including all applications and supporting infrastructure
 - Determine application and infrastructure dependencies
 - Document application criticality, life cycle, and business cycle
 - Group applications and infrastructure into migration groups and patterns
 - Determine migration readiness and suitability, target state design, and migration pattern
 - Develop prioritized migration schedule

Outcomes

- High-fidelity, prioritized migration schedule for initial four migration sprints
- Application and infrastructure data sufficient to group and schedule entire application portfolio

AWS partners and tools

If you need help understanding your IT portfolio, you can work with partners like RISC Networks, Cloudamize, and Deloitte, and you can use the [AWS Application Discovery Service](#).

How-to guide

- [Portfolio discovery and analysis](#)

Application migration

The application migration workstream integrates outputs from other workstreams with the migration of production applications to the AWS Cloud. This workstream guides your resources and leads you through application migration challenges, best practices, agile frameworks, tools, and processes that can be successfully applied to any large-scale migration effort.

Objectives

Migrate business applications from on premises to the AWS Cloud:

- Define how to select and prioritize applications for migrations
- Understand proven best practices to migrate applications to AWS
- Validate your AWS landing zone, operations runbook, and security playbook by testing applications on AWS
- Train internal staff on AWS services and partner tools through hands-on experience
- Learn industry-accepted migration tools and techniques for different application types
- Get a head start by using existing epics (backlogs) from different [migration patterns](#)

Outcomes

- Validate different components of the AWS landing zone through application deployment and testing
- Validate the outlined operating model (an output of the operations workstream) by deploying, monitoring, and reporting on applications running on the AWS Cloud
- Learn scalable agile process and migration patterns for migrating different applications
- Learn how to design target architectures and how to use data migration, server migration, and vendor tools for automated migration
- Train resources on AWS services, and provide hands-on migration experience
- Validate your security playbook through a real-time audit of applications running on AWS
- Learn, implement, and validate a migration delivery process, including number of resources, velocity (speed of migration), quality assurance, release management, and integration with managed service providers (MSPs)

AWS partners and tools

When you have some foundational experience migrating a few applications and a plan in place that the organization supports, it's time to accelerate the migration and achieve scale. Migration Delivery Partners, such as 2nd Watch and Accenture, can help you through every stage of migration. Migration Marketplace Partners such as RiverMeadow Software and Attunity can also help, and you can use tools and services such as [AWS Application Migration Service](#) and [AWS Database Migration Service \(AWS DMS\)](#). For a full list of all migration partners and solutions, see the [AWS Migration Competency Partners](#) website.

Migration governance

The migration governance workstream includes managing migration scope, schedule, resource plan, issues and risks, and communication to all stakeholders. Multiple applications are migrated in multiple streams, impacting multiple teams, so an early focus on planning can help organize the project. The migration plan considers critical factors such as the order in which workloads will migrate, when resources are needed, and how the progress of the migration will be tracked. We recommend agile delivery methodologies, project control best practices, a robust business communication plan, and a well-defined delivery approach.

Objectives

Manage the scope, schedule, resource plan, issues and risks, coordination and communication to all stakeholders:

- Set up scrum teams comprised of internal resources from workstreams defined in this phase
- Identify 10 to 30 applications to migrate from on premises to AWS
- Review your current-state project management methods and capabilities
- Define project management agile methods and tools that will be used during the project
- Identify high-level teams for each workstream
- Define the project charter, reporting, and escalation procedures
- Facilitate the coordination and activities of groups across the project

Outcomes

- Set up an agile program with epics for all workstreams in the readiness and planning phase
- Provide considerations and migration implementation plans for discovery, transformation, and deployment of complex sets of workload components

AWS partners

AWS Migration Competency Partners can help you through every stage of migration, accelerating results by providing personnel, tools, and education in the form of professional services. These partners are either [managed service providers](#) (MSPs) or have a relationship with an AWS-audited MSP to help customers with ongoing support of AWS workloads. To learn more about AWS Migration Competency Partners, see [Migration Partner Solutions](#).

How-to guide

- [Setting up an agile program to accelerate cloud migrations](#)

Landing zone

A landing zone is an orchestration framework for your foundational AWS environment. It provides a baseline to get started with multi-account architecture, identity and access management, governance, data security, network design, and logging.

AWS has two options for creating your landing zone: a service-based landing zone using [AWS Control Tower](#) and a customized landing zone that you build. Each option requires a different level of AWS knowledge.

AWS created Control Tower to help you save time by automating the setup of a landing zone so you can run secure and scalable workloads. Control Tower is managed by AWS and uses best practices and guidelines to help you create your foundational environment. Control Tower uses integrated services like [AWS Service Catalog](#) and [AWS Organizations](#) to provision accounts in your landing zone and manage access to those accounts.

Objectives

Create a landing zone with an initial configuration for the following:

- Account structure
- Network structure
- Predefined identity and billing frameworks
- Predefined user-selectable packages
- Ability to customize and configure

Outcomes

- A defined and secure landing zone ready for migration and further customization

How-to guide

- [Setting up a secure and scalable multi-account AWS environment](#)

Related resources

- [AWS Control Tower](#)
- [AWS Service Catalog](#)
- [AWS Organizations](#)
- [Architecting security & governance across your landing zone](#)

Security, risk, and compliance

The security, risk, and compliance workstream defines a structured approach to help you build confidence in AWS. It also enables foundational security, risk, and compliance capabilities that can accelerate your readiness and planning for a migration project. The delivery approach is built on the AWS CAF security perspective and provides more detailed guidance for security teams who are preparing for a migration of business workloads to AWS. This workstream leverages the concept of a virtual data center to address minimum baseline security and compliance controls. The virtual data center is intended to be constructed through an agile development process using one or more cloud security delivery teams.

Objectives

Create a roadmap for operational constructs to scale on AWS:

- Identify the desired IT service management (ITSM) state and support model
- Review current operational practices (tools, people, processes) on premises and in the cloud
- Identify potential vulnerabilities around scaling operations
- Review business continuity planning (BCP), and create a plan to address any potential impact on operations
- Identify how running the migration factory will impact normal operations
- Identify operational support organizations and partners that will interact with the cloud environments

Outcomes

Develop referenceable playbooks that are supported by relevant code examples and that cover the following five core topics for security and audit tasks utilizing AWS services:

- Identity and access management
- Detective controls
- Infrastructure security
- Data protection

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- Incident response

How-to guide

- [Assessing and building a security foundation for cloud mobilization](#)

Operations

The objective of the operations workstream is to review your current operational model and develop an operations integration approach to support future-state operating models as you migrate to AWS. The operating model should encompass the relationships among people, processes, and tools to support the delivery of organizational objectives. Workstream owners identify and document high-level gaps based on the end-state operational model for tools, processes, and people. A roadmap prioritization is then created for implementation. This roadmap is influenced by, and will influence, the other migration workstreams because of the many interdependencies among security, people, AWS landing zone, and other project workstreams.

Objectives

Create a roadmap for operational constructs to scale on AWS:

- Identify the desired IT service management (ITSM) state and support model
- Review current operational practices (tools, people, processes) on premises and in the cloud
- Identify potential vulnerabilities around scaling operations
- Review business continuity planning (BCP), and create a plan to address any potential impact on operations
- Identify how running the migration will impact normal operations
- Identify operational support organizations and partners who will interact with the cloud environments

Outcomes

- Improved operational posture, and enhanced service-level agreements (SLAs) and operational-level agreements (OLAs)
- Runbooks and design guides for operational silos such as backups, monitoring, and deployments

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- Operational playbook on AWS
 - Business continuity planning/disaster recovery (BCP/DR) playbook
 - ITSM on AWS documented and defined

AWS Partners and tools

As applications are migrated and old systems are retired, your operating model becomes an evergreen set of people, processes, and technology that constantly iterates toward a modern operating model. AWS Partners such as AppDynamics, New Relic, and Dynatrace can help you continue to iterate on your operating model as you move more operations to the cloud.

How-to guide

- [Modernizing operations in the AWS Cloud](#)

People: skills, culture, change, and leadership

This workstream is critical to establishing migration readiness and running a migration at scale. The impact of a cloud migration will be felt across an entire organization and will significantly affect the organizational culture. Additionally, your organizational culture will impact your journey to the cloud. These cultural implications, your organization's receptivity to change, prior change successes and failures, organizational communication patterns, organizational structure, and existing employee training and enablement strategies are all important elements of building a successful approach to migration. To be prepared for an enterprise migration, you must have a critical mass of people with production

AWS experience, established operational processes. You must also have a Cloud Center of Excellence (CCoE) dedicated to mobilizing the appropriate resources and leading the organization through the many organizational and business transformation challenges presented over the course of a large-scale migration effort.

Objectives

- Design the teams responsible for mobilizing critical cloud resources
- Define how the organization builds and implements their cloud strategy by designing teams for the future state of operations
- Establish a dedicated team with single-threaded ownership and strong, visible, engaged executive sponsorship

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- Set functional areas to be managed throughout the migration journey
 - Start to establish a cloud governance model, set of standards, best practices, and guiding principles or tenets
 - Use the AWS OCM 6-Point Framework and Essentials Toolkit, which provides a comprehensive kit of enablement tools to support your cloud adoption journey

Outcomes

- Change management risk document
- Identification of high-level change impacts (by role and by major process)
- Mapping of key stakeholders
- Communication messaging strategy and platform
- Initial communication plan and messaging matrix
- Change management work plan (initial)
- Organizational acceleration charter
- People adoption/acceleration team structure (documented and onboarded)
- Definition of organizational acceleration goals and objectives
- Future state staffing model (target organization structure)
- Change risk scorecard (risk management)
- Leadership alignment document
- Stakeholder report cadence (stakeholder assessment)
- Change area impact analysis, stakeholder-based assessment, and change impact findings and mitigation recommendations
- Organizational readiness assessment report
- Change strategy

- Communication strategy
- Engagement strategy
- Training strategy
- Risk mitigation strategy
- Change acceleration sponsorship roadmap

How-to guide

- [Accelerating cloud adoption through culture, change, and leadership](#)

Migrate phase

Migrations at scale consist of the building blocks, processes, tools, resources, and methodology defined and tested during the readiness and planning phase. After using the best practices and lessons learned from the earlier phases, you can implement a migration factory, a blueprint of scaling implementation and operations, through automation and agile delivery.

Migration factory

In the scale-out phase of the migration project, you will have multiple teams operating concurrently. Some will support a large volume of migrations in the rehost and minor replatform patterns. These teams are referred to as a migration factory. Your migration factory will increase the speed of your migration plan, with multiple sprint teams working in parallel. 20-50 percent of an enterprise application portfolio consists of repeated patterns that can be optimized by a factory approach. This is an agile delivery model, and it is important to create a release management plan. Your plan should be based on current workloads and information generated during the readiness and planning phase. It should be continually optimized for future migration waves and future migration teams. We recommend that you have a backlog of applications that support three sprints for each team. This allows you to re-prioritize applications if you have problems that affect the schedule.

Larger and more complex applications often follow the refactor/rearchitect pattern. They are generally conducted in planned release cycles by the application owner. The factory teams are self-sufficient and include five to six cross-functional roles. They include operations, business analysts and owners, migration engineers, developers, and DevOps professionals. The following are examples of specifically focused migration factory teams:

- Rehost migration teams migrate high-volume, low-complexity applications that don't require material change. These teams leverage migration automation tools. This approach is integrated into patch-and-release management processes.
- Replatform migration teams design and migrate applications that require a change of platform or a repeatable change in application architecture.
- Refactor/re-architect migration team(s) design and migrate complex or core business applications that have many dependencies. In most cases, development and technical operations teams support this business capability. The migration becomes a release cycle or a few release cycles within the plan for that team. There can be many of these in flight, and the Cloud Business Office (CBO) is responsible for tracking timing, risks, and issues through the completion of the migration. This team owns the application migration process.

Items to consider:

- Perform a portfolio analysis to understand common patterns across all applications to help build repeatable work for the factory teams to implement efficiently.
- Use an AWS Partner to help with resource constraints as your team supports regular business activities. AWS and the AWS Partner community can bring specialized resources for specific topics such as databases, application development, and migration tooling.

How-to guide

- [Automating large-scale server migrations with Cloud Migration Factory](#)

Next steps

In this strategy document, we introduced the preparation and implementation steps required for large migrations to the AWS Cloud. Analyzing your current state, building a plan, and iterating the work breaks a large migration into manageable activities for efficient implementation. Looking at a migration as an organizational change project empowers you to build buy-in and maintain communications through each stage of the process. Build a business case and refine the return on investment as the project progresses. Use the AWS Cloud Adoption Framework (AWS CAF) to analyze your environment through the different perspectives of business, people, governance, platform, security, and operations. This analysis gives you a complete view of which areas need improvement before you move forward with a large migration effort.

Use a migration factory construct and iterate on migration patterns to create an optimal move to the AWS Cloud. Today, AWS customers have shifted from asking, “Why migrate to the cloud?” to asking, “When?” Building an effective migration strategy and plan will allow you to respond, “Now!”

Migration is just the beginning of what is possible. After you migrate an application, you can consider your migration experience as a capability that you can use for the optimization phases for this application. You will have a current architecture and a future design. You will implement, test, and validate changes. You will cut over and go live. You now have a new IT capability that can drive speed, agility, and business value for your organization and your company.

Guides

The following guides provide more information about the technical and non-technical aspects of accelerating your migration to the cloud at scale.

- [Evaluating migration readiness](#)
- [Portfolio discovery and analysis for migration](#)
- [A tools catalog for accelerating migration with automation](#)
- [Setting up an agile program to accelerate cloud migrations](#)
- [Setting up a secure and scalable multi-account AWS environment](#)
- [Assessing and building a security foundation for cloud mobilization](#)
- [Modernizing operations in the cloud](#)
- [Accelerating cloud adoption through culture, change, and leadership](#)

Patterns

AWS Prescriptive Guidance patterns provide tools, architectures, and step-by-step guidance for implementing the methodologies for the migration strategy. You'll also find patterns that support other initiatives, such as cloud-native or security projects. You can [view all patterns](#) on the AWS

Prescriptive Guidance website, use the filtering options, or type in a search query to find patterns of interest.

Resources

- [Migrating to Amazon Web Services](#)
- [Migrating to AWS: Best Practices and Strategies](#)
- [AWS Assessment Tool](#)
- [AWS Migration Portfolio Assessment \(MPA\)](#) (requires login)
- [Cloud Adoption Readiness Tool \(CART\)](#)
- Stephen Orban on cloud migration:
 - [Considering a Mass Migration to the Cloud?](#) (blog post)
 - [A Process for Mass Migrations to the Cloud](#) (blog post)
 - [Cloud-Native or Lift-and-Shift?](#) (blog post)
 - [6 Strategies for Migrating Applications to the Cloud](#) (blog post)
 - [Yes, You Can Migrate Your Mainframe to the Cloud](#) (article on *medium.com*)
- [4 Reasons to Re-Consider Lift-and-Shift to the Cloud](#) (article by Joe Chung on *medium.com*)
- [Getting Started with AWS Database Migration Service](#) (presentation at the 2016 AWS Global Summit Series, Chicago)

Document history

The following table describes significant changes to this guide. If you want to be notified about future updates, you can subscribe to an RSS feed from the top navigation bar on this page.

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| Change | Description | Date |
|---------------------|--|-------------------|
| Updated content | We updated the content in the Mobilize phase topic for additional clarity. | February 24, 2020 |
| Initial publication | — | August 5, 2019 |