Migrating to AWS:

Best Practices and Strategies

amazon
web services

"Migrating IT portfolios to the cloud is only the beginning of what is possible." -Stephen Orban
Head of Enterprise Strategy at AWS

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Introduction

mi·gra·tion /mī'grāSH(ə)n/: noun: movement of one part of something to another.

The fundamental process around migration — understanding the benefits of the new system, assessing gaps in the existing system, planning, and then migrating — has not changed much, but the idea of migrating IT assets to the cloud can be intimidating because of the change management required. IT environments have become larger and more complex, and organizations rarely have the opportunity to retire their technical debt as they continue to build new systems.
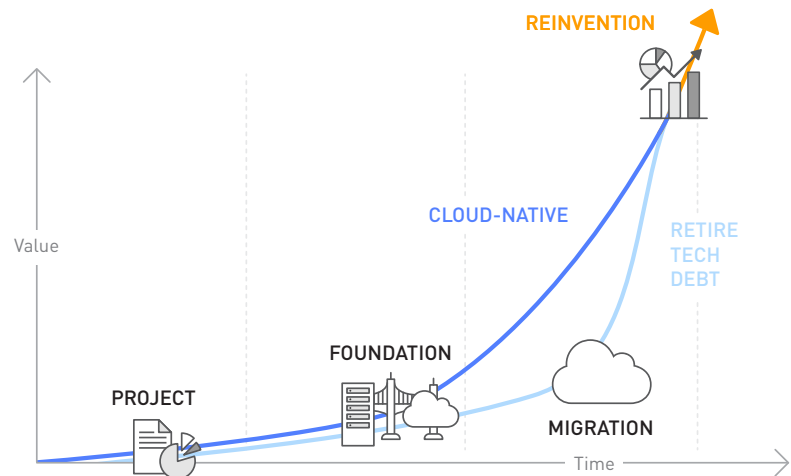
Understanding Migration

Moving a meaningful portion—not necessarily all—of your organization's existing IT assets to the cloud is considered a "migration." A migration might consist of moving a single data center, a collection of data centers or some other portfolio of systems that is larger than a single application.

The decision to migrate to the cloud can be driven by several factors, including: data center lease expiration, required hardware upgrades, software license renewals, location requirements to meet regulatory compliance, global market expansion, increased developer productivity or the need for a standard architecture.

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. Amazon Web Services (AWS) has combined its knowledge about migrations with the experience gained from helping organizations move their IT portfolios to the cloud, and developed two models that many customers have found useful.

These two models are:
- **The Five-Phase Migration Process**
- **The Six Common Strategies for Migrating to the Cloud ("The 6 R's")**

"There is no one-size-fits-all answer to determining the correct strategy for application migration." -Stephen Orban

Two Mental Models

The five-phase migration process, and the six common strategies for migration ("The 6 R's"), serve as guiding principles to approach a migration, but are not considered hard-and-fast rules. Every organization has its own unique goals, constraints, budgets, politics, culture, and market pressures that will guide its decision-making process along the way.
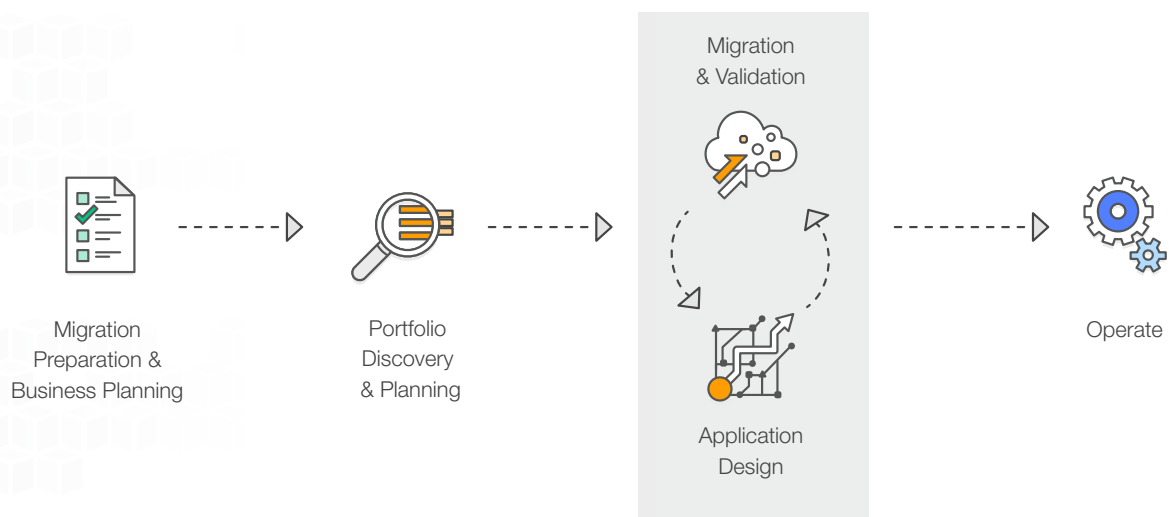
THE FIVE-PHASE MIGRATION PROCESS

The first model is a five-phase migration process that can help organizations approach a migration of tens, hundreds, or thousands of applications. It is important to note that while each of the phases is a common component of a successful migration, they do not need to occur in the order listed.
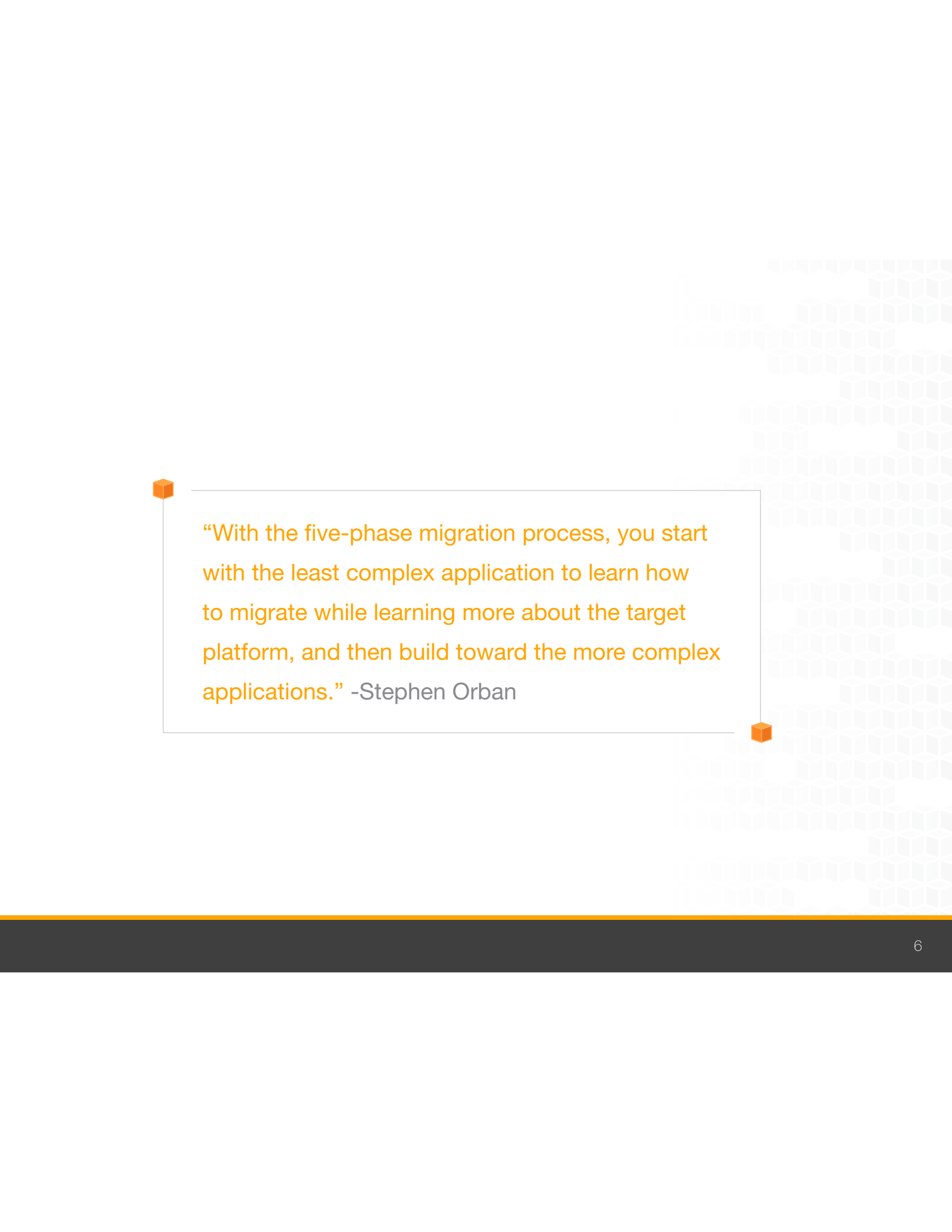
SIX COMMON MIGRATION STRATEGIES ("THE 6 R'S")

Organizations usually begin to think about how they will migrate an application during the second phase of the migration process—Portfolio Discovery and Planning. This is when they determine what is in their environment, and the migration strategy for each application. The six approaches detailed (rehost, replatform, re-architect, repurchase, retain, and retire) are the most common migration strategies employed, and build upon "The 5 R's" that Gartner outlined in 2011.

The Five-Phase Migration Process

The Five-Phase Migration Process Diagram

"With the five-phase migration process, you start with the least complex application to learn how to migrate while learning more about the target platform, and then build toward the more complex applications." -Stephen Orban

PHASE 1:
MIGRATION PREPARATION AND BUSINESS PLANNING

If you don't have a plan, you may be planning to fail

Developing a sound business case requires taking your objectives into account, along with the age and architecture of your existing applications, and their constraints.

Engaged leadership, frequent communication, and clarity of purpose, along with aggressive but realistic goals and timelines make it easier for an entire organization to rally behind the decision to migrate.

PHASE 2:
PORTFOLIO DISCOVERY AND PLANNING

Crawl, Walk, Run

Full portfolio analysis of your environment, complete with a map of interdependencies, as well as migration strategies and priorities, are key elements to building a successful migration plan.

The complexity and level of business impact of your applications will influence how you migrate. Beginning the migration process with less critical and complex applications in your portfolio creates a sound learning opportunity for your team to exit their initial round of migration with:

- Confidence that they are not practicing with mission critical applications in the early learning stages.

- Foundational learnings they can apply to future iterations.

- Ability to fill skills and process gaps and positively reinforce best practices now based on experience.

PHASE 3 / PHASE 4:
DESIGNING, MIGRATING, AND VALIDATING APPLICATIONS
Agile, Flexible, Iterative

In these phases, the focus shifts from the portfolio level to the individual application level. Each application is designed, migrated, and validated according to one of the six common migration strategies ("The 6 R's").

A continuous improvement approach is often recommended. The level of project fluidity and success frequently comes down to how well you apply the iterative methodology in these phases.
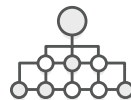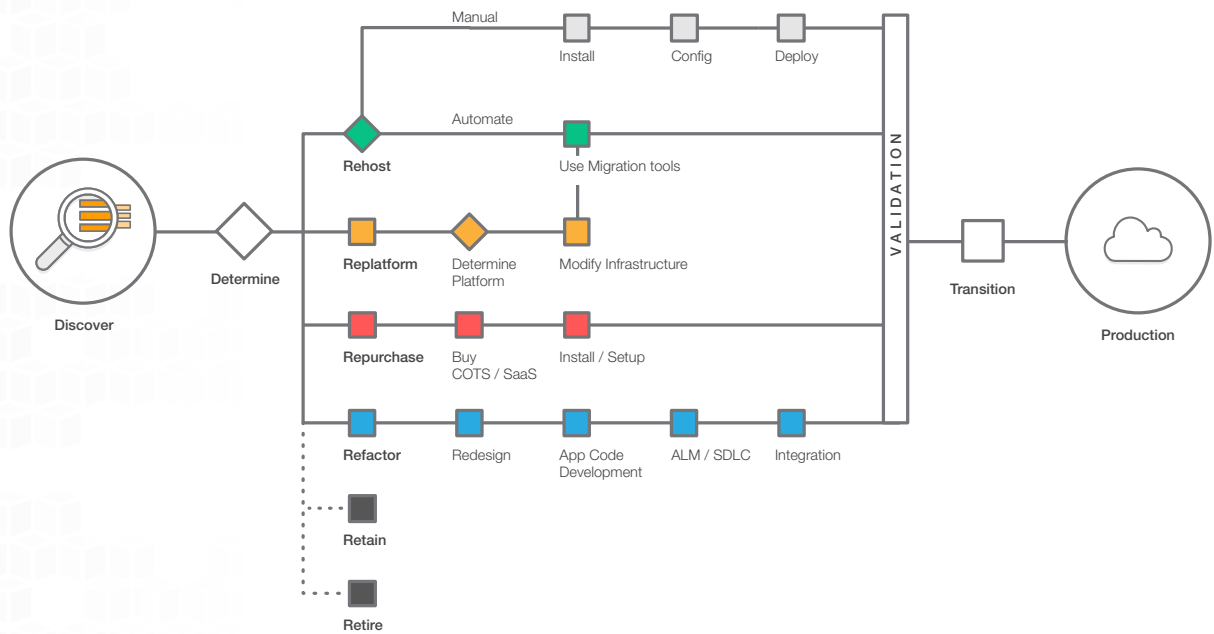
PHASE 5:
MODERN OPERATING MODEL
Shift to cloud

As applications are migrated, you optimize your new foundation, turn off old systems, and constantly iterate toward a modern operating model. Think about your operating model as an evergreen set of people, processes, and technologies that constantly improves as you migrate more applications.

Ideally, you will be building off the foundational expertise you already developed. If not, use your first few application migrations to develop that foundation, and your operating model will continually improve and become more sophisticated as your migration accelerates.

Six Common Strategies for Migration: "The 6 R's"

Manual
Install   Config   Deploy

Automate
Rehost   Use Migration tools

VALIDATION

Determine   Replatform   Determine Platform   Modify Infrastructure

Discover

Repurchase   Buy COTS / SaaS   Install / Setup

Transition

Production

Refactor   Redesign   App Code Development   ALM / SDLC   Integration

Retain

Retire

Six Common Migration Strategies: Detailed View Diagram

1. REHOST – *Also known as "lift-and-shift."*
In a large legacy migration scenario where the organization is looking to implement its migration and scale quickly to meet a business case, we find that the majority of applications are rehosted.

Most rehosting can be automated with tools such as AWS Server Migration Service (SMS), although some customers prefer to do this manually as they learn how to apply their legacy systems to the new cloud platform.

It has also become evident that applications are easier to optimize/re-architect once they are already running in the cloud. 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 – *Sometimes referred to as "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, so you move to a database-as-a-service offering like Amazon Relational Database Service (Amazon RDS).

3. REPURCHASE – *Replacing your current environment, casually referred to as "drop and shop."*
This is a decision to move to a newer version or different solution, and likely means your organization is willing to change the existing licensing model it has 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 –

Changing the way the application is architected and developed, usually done by employing cloud-native features.

Typically, this is driven by a strong business need to add features, scale, or improve 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.
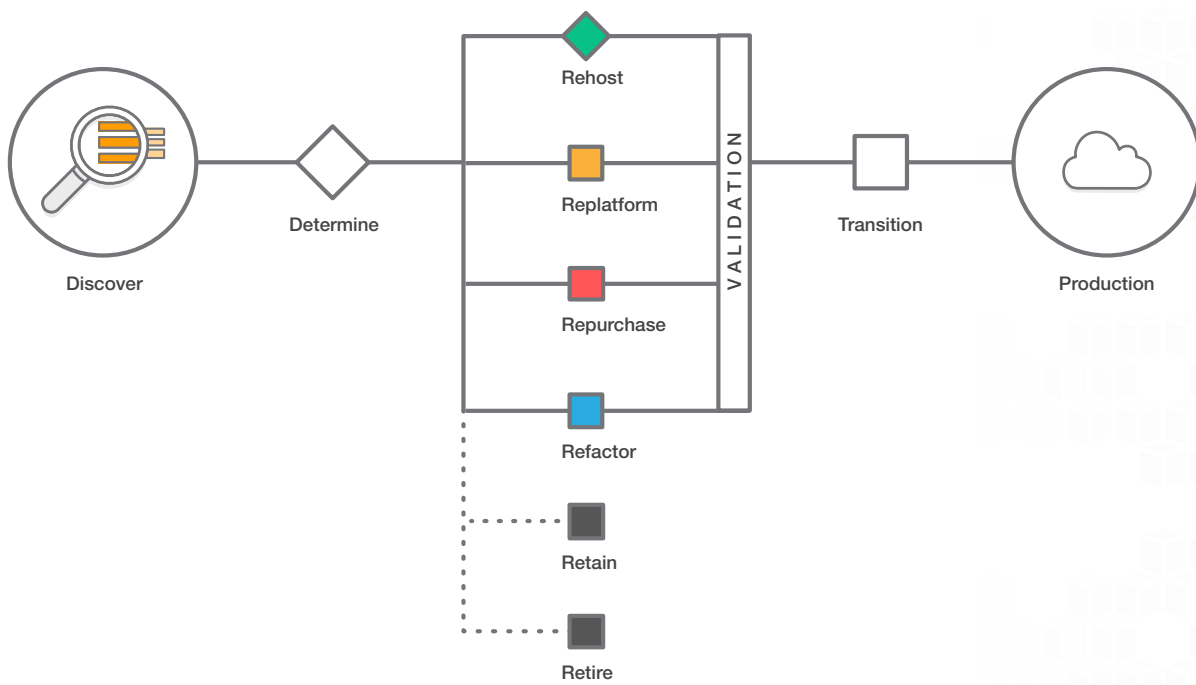
5. RETIRE *– Decommission or archive unneeded portions of your IT portfolio.*

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

6. RETAIN *– Do nothing, for now—revisit.*

Organizations retain portions of their IT portfolio because there are some that they are not ready to migrate and feel more comfortable keeping them on-premises, or they are not ready to migrate an application that was recently upgraded and then make changes to it again.

You should only migrate what makes sense for the business, but the more your portfolio moves to the cloud, the fewer reasons you will have to retain.

Discover · Determine · Rehost · Replatform · Repurchase · Refactor · Retain · Retire · VALIDATION · Transition · Production

Six Common Migration Strategies: Condensed View Diagram

Migration Strategies: Employing "The 6 R's"

Organizations considering a migration often debate the approach to get there. While there is no one-size-fits-all approach, the focus should be on grouping each of the IT portfolio's applications into buckets defined by one of the migration strategies.

Some of these choices are clear, and easy to determine. Some organizations will decide that migrating their back-office technology to an as-a-service model will best suit their needs, and employ a repurchase strategy for those applications. Others will look for ways to retire systems and applications that are no longer in use. Still others will decide that retaining certain portions of their portfolio as-is, on-premises, is the best solution for their current situation, with a plan to revisit how to migrate these applications later.

In cases where choosing the correct migration strategy for a bucket of applications is not as obvious, it is important to consider organizational objectives and constraints. While re-architecting a specific group of the applications may be required, it should not be the only migration strategy that is considered.

Organizations with a compelling reason to migrate quickly—for example, a data center lease is expiring; wanting to avoid a costly refresh cycle; or looking to achieve a quick budget win—should understand the rehosting migration strategy. In a large legacy scenario where an organization is looking to scale the migration quickly, AWS has found that many applications are rehosted.

The replatform strategy is similar to rehosting because the core architecture of the applications is not changed when they are replatformed. The biggest difference is that when the replatform strategy is used, a few cloud optimizations may be made to deliver a specific, tangible benefit such as migrating your application to a fully managed platform like AWS Elastic Beanstalk.

The re-architect migration strategy takes more time to execute, but can ultimately prove to be an effective way for an organization to reestablish its culture. It also typically leads to a healthy Return on Investment (ROI), and can help to reset the stage for years of agile development and continuous reinvention to boost overall performance. The re-architect strategy should be considered in cases where a cloud-native architecture is necessary to achieve needed business capabilities. Examples of this include performance, scalability, globalization, and the desire to move to a more agile, DevOps model.

Additional Resources

Below are sample experiences and conversations that CIOs of enterprise organizations have shared with Stephen Orban, Head of Enterprise Strategy at AWS. We encourage you to use these insights as additional resources for your cloud adoption journey.

1. **PROVIDE EXECUTIVE SUPPORT**
   Today's IT Executive is a Chief Change Management Officer

2. **EDUCATE STAFF**
   You Already Have the People You Need to Succeed with the Cloud

3. **CREATE A CULTURE OF EXPERIMENTATION**
   Create a Culture of Experimentation Enabled by the Cloud

4. **ENGAGE PARTNERS**
   Accelerate Your Cloud Strategy with Partners

5. **CREATE A CLOUD CENTER OF EXCELLENCE (CCOE)**
   How to Create a Cloud Center of Excellence in Your Enterprise

6. **IMPLEMENT A HYBRID ARCHITECTURE**
   Three Myths About Hybrid Architectures Using the Cloud

7. **IMPLEMENT A CLOUD-FIRST STRATEGY**
   What Cloud-First Looks Like

   These articles, and more, can be viewed online at:
   medium.com/aws-enterprise-collection/an-e-book-of-cloud-best-practices-for-your-enterprise-4a211840c55b

8. **AWS ENTERPRISE COLLECTION**
   medium.com/aws-enterprise-collection/tagged/cloud-migration

This e-Book is based on a <u>blog series</u> by:

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