Taking the yellow brick road…
An AWS migration story.

Subheading goes here

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The yellow brick road is not so winding anymore.
Transformation is a Journey (Stages of Adoption, or SofA)

1. Project
2. Hybrid
3. Scaling
4. Cloud-first
State of Adoption 1: **Project**

AWS is used on a project-by-project basis, or shadow IT. Solves specific need(s).

Has few AWS skill sets in-house

Customer is proving to themselves that cloud is a viable option.
State of Adoption 2: Hybrid

Partners are trusted advisors and enablers, have earned the customer’s trust.

AWS extends existing data centers
Opens up many new projects

Training and establishing a Cloud Center of Excellence
Establish scalable security and compliance models
State of Adoption 3: Scaling

Partner is an accelerator, introducing tools and people to execute migrations and improve operations.

Preparing for long-term cloud operations

Cloud Center of Excellence is established

IT roles redefined

Groups of production applications and/or data centers migrate
State of Adoption 4: **Cloud-First**

Partner is an operator (MSP) partner and optimizer, constantly focused on doing things for less and more quickly.

Cloud becomes default choice

New business models explored

Switch from “Why Cloud?” to “Why Not Cloud?”

More comfortable with cloud operations than on-premises
Migration Process “Mental Model”

1) Evaluate opportunity
2) Discover, Analyze and Plan
3) Application Design
4) Migrate, Integrate, and Validate
5) Operate and Optimize
Different routes on the yellow brick road.
5 Phases of the Migration Process

The migration process includes **FIVE** phases:

**Opportunity evaluation**
Analyze the cost and benefits associated with migrating to the cloud and determine which parts of your IT portfolios will be migrated.

**Discovery, analysis, and planning**
Assess your migration portfolio and formulate a plan. You will also create a cloud center of excellence (CoE) team.

**Design.**
Design/Architect cloud infrastructure based on step 2 output. You will decide on AWS services that best fit each single application including computing, storage, database, networking, etc. Design should be for both short term (i.e. lift & shift, re-platforming, replace) as well as long term (modernizing, re-architecting).

**Migration, integration and validation**
Phases 3 and 4 are typically referred to as the migration factory. You focus at an application level and iterate through these two phases for each application being migrated. Working with the application owner to determine the target architecture and strategy is critical. Once migrated, a functional validation is performed.

**Operations and optimization**
Upon successful validation, the source (on-premises) application is deprecated and the application continues to operate in the cloud.
<table>
<thead>
<tr>
<th>Migration Pattern Label</th>
<th>Migration Pattern Name</th>
<th>Pattern Description</th>
<th>Example</th>
</tr>
</thead>
</table>
| R1                      | Retain                 | Client will keep host / application in their source environment  
|                         |                        | Minimal analysis/validation of scope and application affinity  
|                         |                        | Dependency on integrating service management | Mainframe  
|                         |                        | UNIX host / applications |
| R2                      | Retire*                | Application and host decommission on source  
|                         |                        | No migration to target  
|                         |                        | Application owner approvals needed | Existing Decommission Program Scope  
|                         |                        | UNIX, SCO;  
|                         |                        | Clustered host for DR, alternative HA hosts |
| R3                      | Re-Hosting*            | Like for Like application migration to target cloud  
|                         |                        | Minimal effort to make the application work on the target cloud infrastructure (Minimal appl layout change)  
|                         |                        | Storage migration will be needed (without conversion)  
|                         |                        | UAT - Some level of application testing | Simple to Medium V2V, P2V  
|                         |                        | Storage: Local to DASD  
|                         |                        | RHEL 6 above  
|                         |                        | Win 2008 above |
| R4                      | Re-Platform*           | Up-Version of the OS and/or Database onto the target cloud  
|                         |                        | Storage migration will be needed (without conversion)  
|                         |                        | Some level of application changes  
|                         |                        | Application reinstallion on the target  
|                         |                        | UAT is highly recommended  
|                         |                        | Database to AWS RDS | W2K3 to Win 2012; Win 2008 below; RHEL below; Oracle 8 to 11; All databases  
|                         |                        | New application releases  
|                         |                        | All clusters (MS cluster, DR)  
|                         |                        | MS SQL same technology (RDS) |
| R5                      | Refactor*              | OS and/or Database porting  
|                         |                        | Middleware and application change to cloudify an application  
|                         |                        | Data conversion; Database transition to MySQL, Aurora, etc.  
|                         |                        | UAT required | AIX to Linux  
|                         |                        | Oracle to SQL; SQL to Aurora  
|                         |                        | Middleware, IBM products |
| R6                      | Re-Purchase*           | Replacing the application with a SaaS offering or COTS product  
|                         |                        | Purchasing a cloud-compatible license | Oracle PeopleSoft |

* Reduces TCO
Cloud Migration Strategies

Discover/Assess/Prioritize Applications

Use Migration Tools

Transition Production

Retain / Not Moving

Redesign Application/Infrastructure Architecture

App Code Development

Full ALM / SDLC

Integration

Validation

Transition

Production

Manual Install

Manual Config

Manual Install & Setup

Determine new platform

Modify underlying Infrastructure

Determine Migration Path

Rehosting (Lift and Shift)

Replatforming (Lift & Reshape)

Repurchasing (Replace - Drop & Shop)

Refactoring (Decoupling applications)

Redesign Application/ SaaS & licensing

Purchase COTS/

Full ALM / SDLC

Integration
## Comparing Cloud Migration Strategies

<table>
<thead>
<tr>
<th>Migration Complexity</th>
<th>Time</th>
<th>Cost</th>
<th>Agility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Retain</td>
<td>+</td>
<td>+</td>
<td>N/A</td>
</tr>
<tr>
<td>Retire</td>
<td>+</td>
<td>+</td>
<td>N/A</td>
</tr>
<tr>
<td>Re-host</td>
<td>++</td>
<td>++</td>
<td>++</td>
</tr>
<tr>
<td>Re-purchase</td>
<td>+++</td>
<td>+++</td>
<td>+++</td>
</tr>
<tr>
<td>Re-platform</td>
<td>+++</td>
<td>+++</td>
<td>+++</td>
</tr>
<tr>
<td>Refactor</td>
<td>++++</td>
<td>++++</td>
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</tbody>
</table>
Ways to make the road a little more comfortable.
AWS Migration Methodology

- Portfolio Discovery
- Goals and Drivers
- Prioritized Backlog
- Foundations (target zone setup)
- Setup Factory (Tools, Teams, Process)

Initiate

Prioritized Backlog (PLAN)
- App 1
- App 2
- ...
- App n

Migration Factory

- Discover
- Analyze
- Plan
- Integrate
- Migrate
- Design
- Validate
- Operate

Optimize

- Application optimization
- Process optimization
- Operational optimization
- Cost optimization
Tools should **automate** your discovery process and can be classified as:

- Agent-based vs Agentless
- Port scanning vs Packet scanning
- Appliance-based vs SaaS offering
Picking a Portfolio Discovery Tool

**How** should you choose a discovery tool for your environment?

➢ How will you deploy agents if it is an agent based solution?

➢ Will your security policies let you share administrative credentials if needed with the tool?

➢ Can the discovered data be stored in a location outside of your organization?

➢ Do you have or need application-to-port mapping details?

➢ Do any of your applications use custom ports?

➢ Are you running any custom applications in your environment?

➢ Are there any restrictions on the type of ports that can be used for scanning?

➢ Do you need automated right sizing of the target environment?

➢ Do you need estimated run costs of the target environment?

➢ Do you have or need deep application performance monitoring?

➢ Do you need deep infrastructure performance monitoring?
Getting Ready for Migration Planning

Before you can create a detailed plan for your cloud migration project, you must have:

➢ A final architecture for the target environment in the AWS cloud.
➢ Understand hybrid connectivity with the target cloud environment.
➢ A discovery of your cloud migration portfolio.
➢ Details of the application owners.
➢ Come up with a contingency plan to ensure that the blast radius is small if there are issues.
Determine the Migration Strategy

Discover/Assess/Prioritize Applications

Use Migration Tools

Transition Production

Retain / Not Moving

Redesign Application/Infrastructure Architecture

App Code Development

Full ALM / SDLC

Integration

Manual Install & Setup

Rehosting (Lift and Shift)

Replatforming (Lift & Reshape)

Repurchasing (Replace - Drop & Shop)

Redeploy (Re-deploying applications)

Redesign Application/ Infrastructure

Purchase COTS/ SaaS & licensing

Modify underlying Infrastructure

Validate

Transition

Production

Determine new platform

Automate

Manual Deploy

Manual Install

Manual Config

Manual

Manual
deploy
Migration Planning Final Planning

The **Final** things to plan for before you start to migrate are the following:

- Come up with a series of tests for the application and your users.
- Figure out how you will cutover.
- Identify the stakeholders for support and escalation and work with them on operational plans.
- Come up with what the success criteria will look like in order to flip to the new environment.
- Take one last baseline performance analysis of the source environment to compare to the new environment.
Migration Sprint Teams

**Foundations & Operations**
Builds and validates appropriate foundational components that ensure Dev, Test, Prod environments are scalable and appropriately maintained and monitored. Prepares landing zones as needed for migrations.

**Portfolio Discovery**
Accelerates downstream activities by executing application discovery and optimizing application backlogs. Works to eliminate objections and minimize wasted effort.

**Lift & Shift Migration**
Migrates large quantities of simple applications that don’t require refactoring or re-platform. Heavy utilization of migration automation tools. Rapidly delivering large quantities of small incremental value.

**Re-Platform Migration**
Designs, Architects, and migrates more complex applications that require a change of platform or a change in application architecture. Migrating fewer applications that provide a higher return per migration.

**Re-Factor**
Builds and validates appropriate foundational components that ensure Dev, Test, Prod environments are scalable and appropriately maintained and monitored.

**Innovation**
Works in coordination with foundation, migration, and transition teams to develop repeatable solutions that will expedite migrations. Tackles larger or more complex technical issues for the migration teams.
Migration Tools

Several AWS partners including CloudEndure and Racemi help execute migrations to AWS by capturing your host server, configuration, storage and network states, then provision and configure your AWS target resources.

AWS also provides Server Migration Service (SMS), 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.

Migration Competency Partners for Workload Mobility

https://aws.amazon.com/migration/partner-solutions/
LEARN. NETWORK. EXPERIENCE OPEN SOURCE.