

# Executing Migrations to AWS

**Manuel Mazzolin**, Senior BDM Transformation

**Laura Schütz**, Cloud Migration Consultant



# Business drivers for migrating to the cloud



# Real customer outcomes



## Cost Savings

“realized a 52 percent reduction in TCO”

**General Electric**

“avoided acquiring additional data center space, saving an estimated \$1M+ over three years”

**Lionsgate**

“reducing its data center footprint from eight to three by 2018”

**Capital One**



## Staff Productivity

“we have enhanced software development by 20%”

**Orbis**

“without AWS, we would need the DevOps team to be at least twice the size”

**Avizia**

“with half the people normally required to build and operate sites”

**Bustle**



## Operational Resilience

“15% increase in availability”

**Conde Nast**

“We're seeing up to 99.99% availability”

**Vodafone Italy**

“availability increased from 99.7 to of 99.999”

**2C2P**



## Business Agility

“gone from deployments taking 6 weeks to 1 per week”

**3M**

“set up in about 1/5 of the time it would taken to do a buildout and deployment”

**Intuit**

“our projects no longer last years, they last months”

**Autodesk**



# Migration challenges

- How do I compare costs to AWS?
- How do I size AWS EC2 instances?
- How do I know if I am picking the right licensing for my Business Case?
- Who else should be supporting the migration?
- My CMDB is out-of-date, what software is running on each server?
- What's my actual utilization?
- What are my application dependencies?
- Large volumes of data - difficult & time consuming to process/plan
- What, how, and when should I migrate which applications
- How do I know that I can operate securely?
- Which tools are available for servers migrations? And for Data migrations?
- How do I know an app migration is complete?
- How do I track progress without slowing down?

---

Create a case for change

---

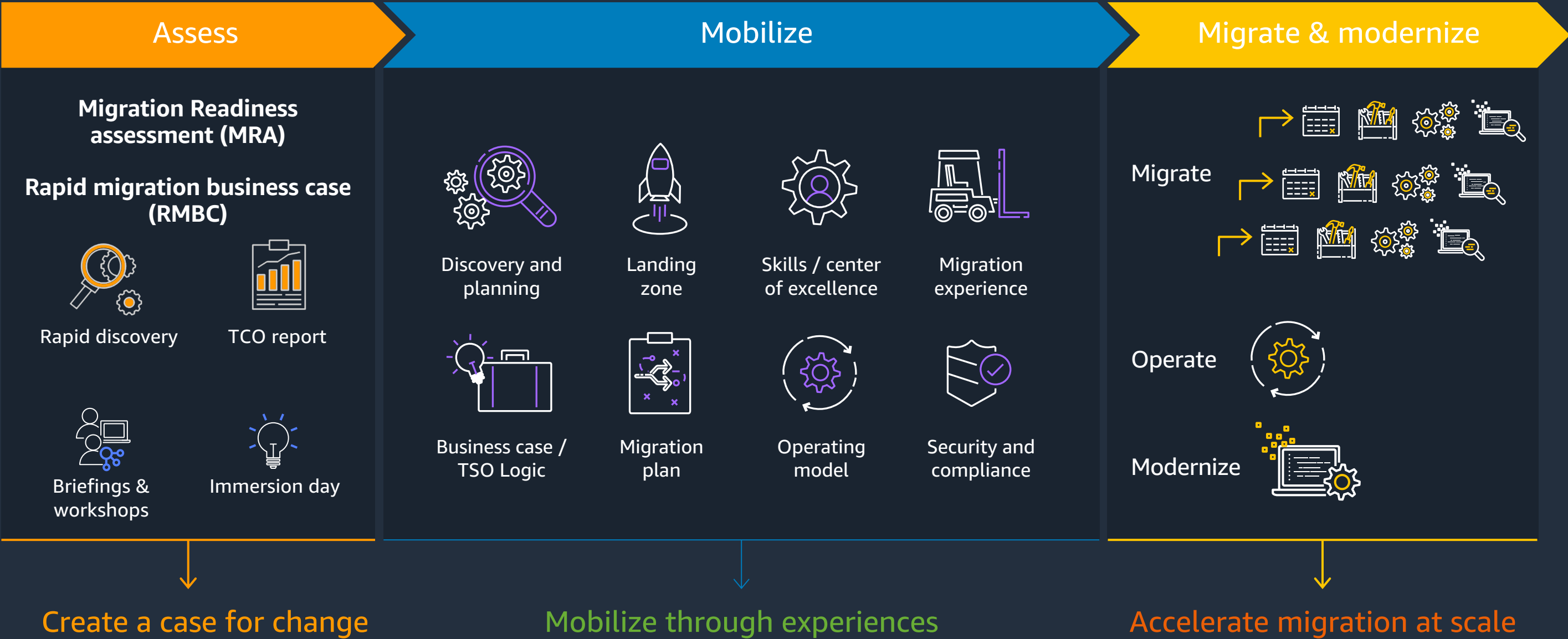
Mobilize through experiences

---

Accelerate migration at scale



# Migration customer journey



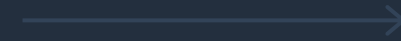
# Migration process: Assess



Assess



Mobilize



Migrate & modernize



# Rapid discovery and TCO Report with TSO Logic



TSO Logic ingests millions of data points about an environment.

Customers can run “pivots”—viewing their IT assets by drilling down into different groupings.

**TSO Logic** Hello, amajorki

Type to search by name  
Filter by:  Fault

Applications | Lines of Business | LOB-Databases  
Departments | **Environments** | Migration Waves  
SLA | Managers | Operating Systems | Virtualization  
Bare-Metal | Models | Locations

**Environments**

- Development
  - Customer Payments
    - Payment Processing
      - Bare\_00139
      - Bare\_00140
      - OS\_00123
      - OS\_00131
      - OS\_00132
      - OS\_00133
      - OS\_00138
      - VM\_00120
      - VM\_00121
      - VM\_00122
      - VM\_00124
      - VM\_00125
      - VM\_00126
      - VM\_00127
      - VM\_00128
      - VM\_00129
      - VM\_00130
      - VM\_00134
      - VM\_00135
      - VM\_00136
      - VM\_00137
    - Incentive Compensation
      - Data Warehouse
      - Document Management

**DETAILS: Environments**

**COST MODELER > Environments**

Scenarios Cash Flow ?

**COSTS WITH CURRENT PROVISIONING** **\$5,026,908.24 / Year**

1,141 OS Instances with complete provisioning	\$1,986,671.56	?
0 OS Instances with incomplete provisioning	\$0.00	
385,401 GB of Storage with complete provisioning	\$636,436.65	
0 GB of Storage with incomplete provisioning	\$0.00	
370 Cores of SQL Server Enterprise	\$1,850,000.03	
170 Cores of SQL Server Standard	\$510,000.01	
146 Cores of SQL Server Web	\$43,800.00	

**SCENARIOS** My Scenarios ? Add New Scenario

**SCENARIO - SQL Server Using BYOL** Term: 3 Years All Upfront Edit | Delete

	Direct Match ?		TSO Right Sized ?		
	Upfront	Monthly	Upfront	Monthly	
1,141 OS Matched	\$8,022,493.00	\$0.00	858 OS Matched 283 OS Ignored ?	\$3,094,310.00 \$0.00	
386,948 GB Matched	\$0.00	\$30,728.16	293,520 GB Matched 93,158 GB Ignored ?	\$0.00 \$23,256.90	
740 Cores of BYOL MS SQL Enterprise	--	\$154,166.67	262 Cores of BYOL MS SQL Enterprise	--	\$54,583.33
334 Cores of BYOL MS SQL Standard	--	\$69,583.33	136 Cores of BYOL MS SQL Standard	--	\$28,333.33
304 Cores of BYOL MS SQL Web	--	\$63,333.33	148 Cores of BYOL MS SQL Web	--	\$30,833.33

Bar chart showing costs for CURRENT and SQL Server Using BYOL scenarios.



An Amazon Web Services Company



# Optimization and Licensing Assessment: Rightsizing to AWS

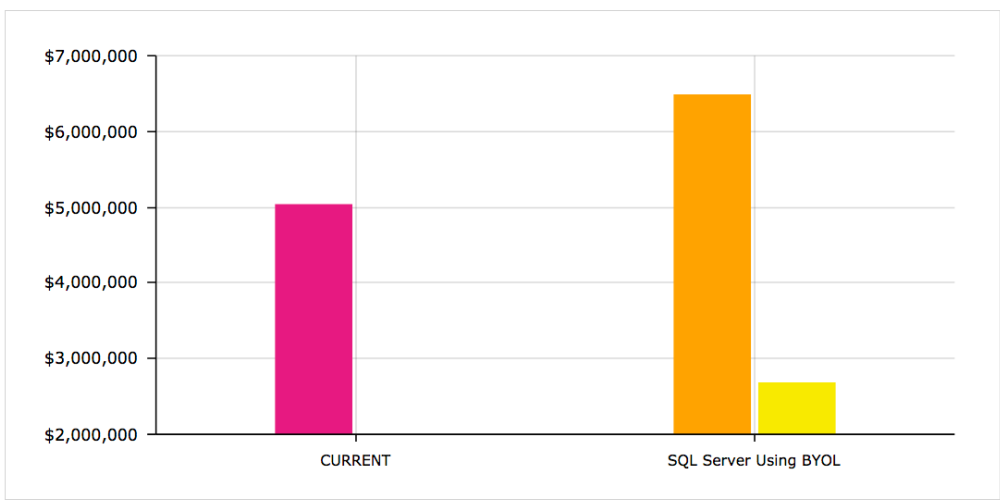


Directional costing of current compute and storage.

**COSTS WITH CURRENT PROVISIONING**

**\$5,026,908.24 / Year**

1,141 OS Instances with complete provisioning	\$1,986,671.56
0 OS Instances with incomplete provisioning	\$0.00
385,401 GB of Storage with complete provisioning	\$636,436.65
0 GB of Storage with incomplete provisioning	\$0.00
370 Cores of SQL Server Enterprise	\$1,850,000.03
170 Cores of SQL Server Standard	\$510,000.01
146 Cores of SQL Server Web	\$43,800.00



Finds the best-fit, best-price, AWS configuration – based on historical usage.

**SCENARIOS** My Scenarios ? ? Add New Scenario

**SCENARIO - SQL Server Using BYOL** Term: 3 Years All Upfront Edit | Delete

	Direct Match <span>?</span>		TSO Right Sized <span>?</span>	
	Upfront	Monthly	Upfront	Monthly
1,141 OS Matched	\$8,022,493.00	\$0.00	858 OS Matched	\$3,094,310.00
			283 OS Ignored	--
386,948 GB Matched	\$0.00	\$30,728.16	293,520 GB Matched	\$0.00
			93,158 GB Ignored	--
740 Cores of BYOL MS SQL Enterprise	--	\$154,166.67	262 Cores of BYOL MS SQL Enterprise	\$54,583.33
334 Cores of BYOL MS SQL Standard	--	\$69,583.33	136 Cores of BYOL MS SQL Standard	\$28,333.33
304 Cores of BYOL MS SQL Web	--	\$63,333.33	148 Cores of BYOL MS SQL Web	\$30,833.33





# AWS operating cost optimization levers



Area	#	Lever	Description	\$ impact
Compute	1.1	<b>Instance right sizing (CPU &amp; RAM utilizat.)</b>	Mapping servers based on Actual Resource Consumption (ARC) that allows using the lowest cost resource that still meets the technical specifications of a specific workload	
	1.2	<b>Purchasing options elasticity</b>	Applying the most cost efficient purchase option based on time server is used, i.e. Reserved Instances/Savings Plans for machines running 24/7 (e.g. Prod) and on-demand for running limited period of time (e.g. Dev, Test)	
	1.3	<b>Upfront payment</b>	Using all or partial upfront payment option offering additional discount	
	1.4	<b>Servers number rationalization</b>	Eliminating servers that are not needed in the Cloud, e.g. not used / "Zombies", legacy to be retired, not required due to change of architecture (e.g. backup servers, smaller cluster, DR)	
	1.5	<b>AMD instances</b>	Using instances with AMD EPYC processors offering comparable performance at lower cost	
Storage	2.1	<b>Storage utilization</b>	Mapping storage based on used volumes (vs Raw or Provisioned/Usable)	
	2.2	<b>Storage optimization</b>	Applying the most appropriate type of storage (Local, File system, Object) and its class (e.g. local SSD vs HDD, object Frequent vs Infrequent Access) based on the lifecycle policies and other needs	
Licenses	3.1	<b>License optimization</b>	Evaluating license requirements and identifying optimization areas (e.g. move from SQL Server Enterprise edition to Standard, reducing # of cores); Applying the most cost efficient licensing model (BYOL vs LI)	
	3.2	<b>Modernization</b>	Moving from commercial DB engine and/or OS to open source	
Others	4.1	<b>Cloud native solution</b>	Re-factoring applications to cloud native solution (e.g. server-less architecture)	
	4.2	<b>Programs</b>	Applying AWS programs to provide financial and expert support with transformation journey (e.g. migration, modernization, PoC), as well as volume discounts	



# Migration process: Mobilize



Assess



Mobilize



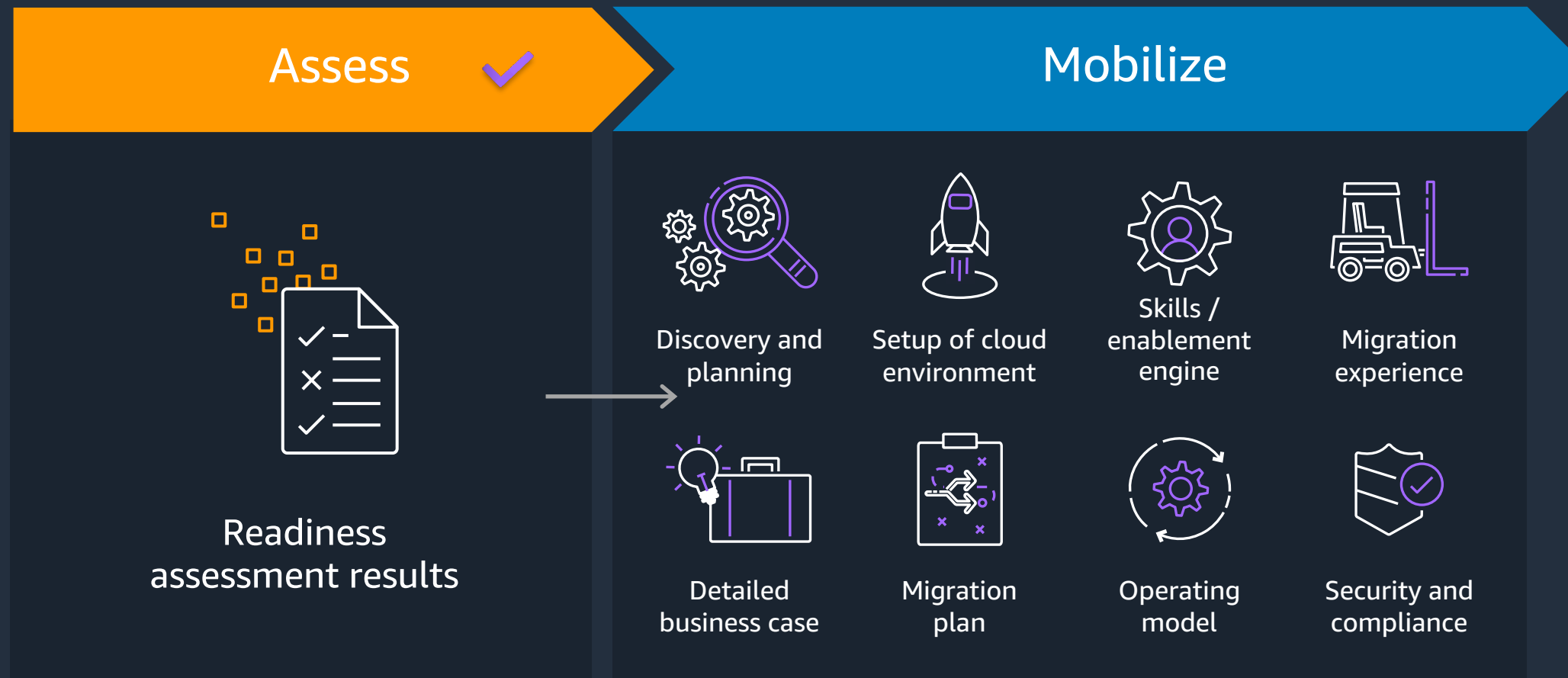
Migrate & modernize



# Use assessment results to improve your migration readiness and planning, and mobilize resources



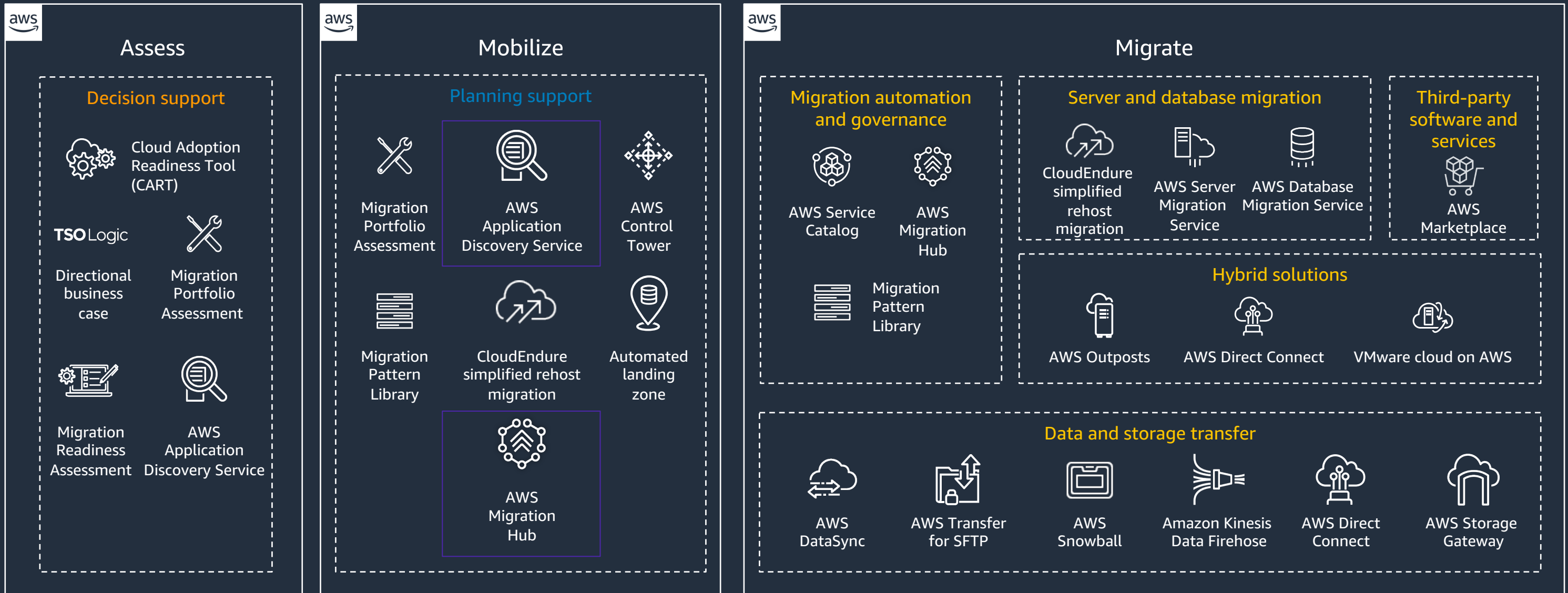
Mobilize



# Broadest and deepest set of capabilities to accelerate your migration



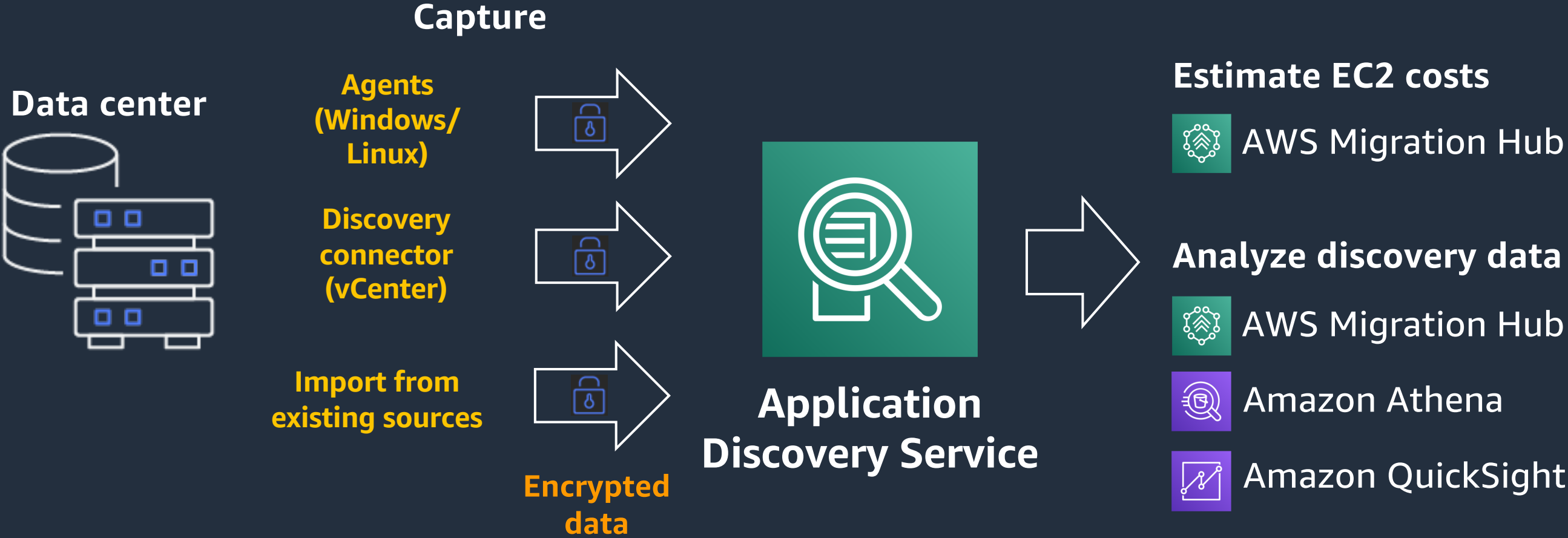
Mobilize



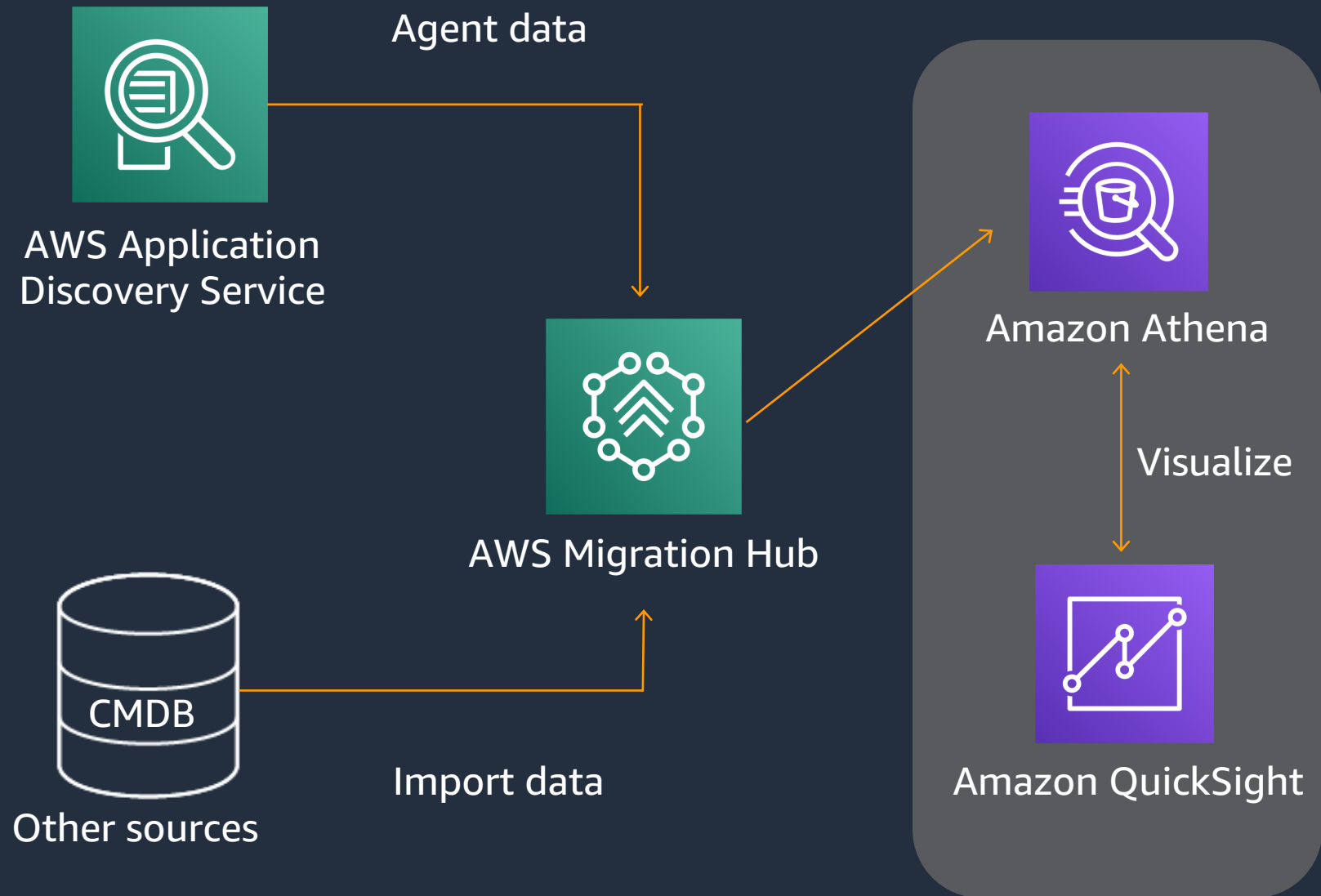


# How to perform discovery

## Capture and visualize system inventory, performance, and dependencies



# Migration planning using Athena and Amazon QuickSight



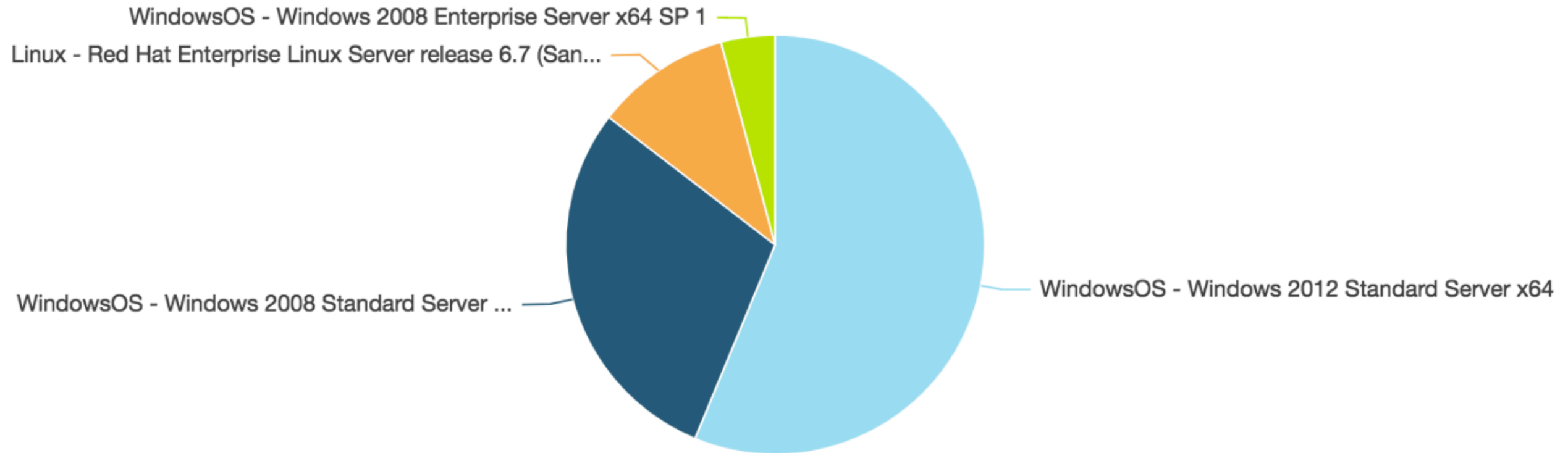
- 1) Validate data completeness
- 2) Analyze utilization metrics
- 3) Identify running software
- 4) Analyze interdependencies
- 5) Group servers into applications
- 6) Migrate and track applications



# Operating system info in Amazon QuickSight



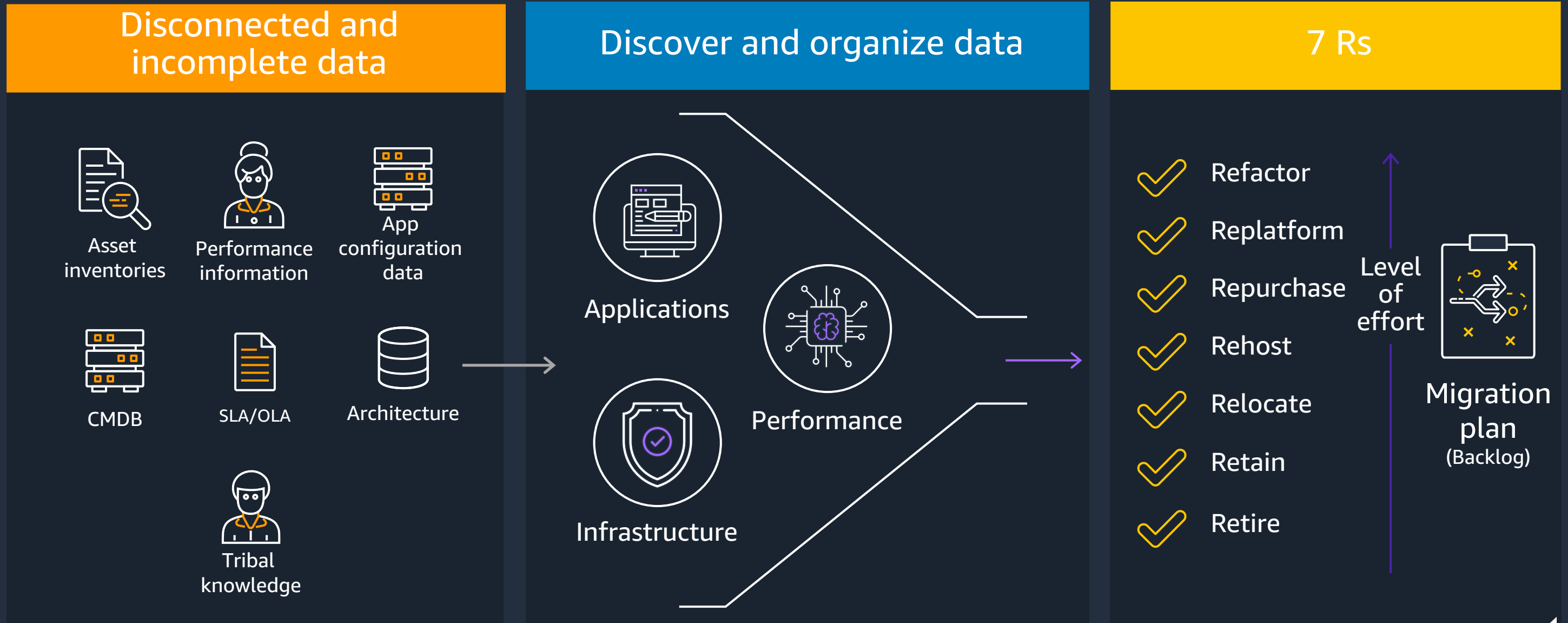
Mobilize



# Determine the right migration pattern for your apps



Mobilize

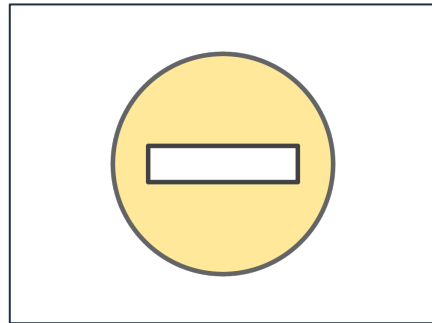




# R's explained



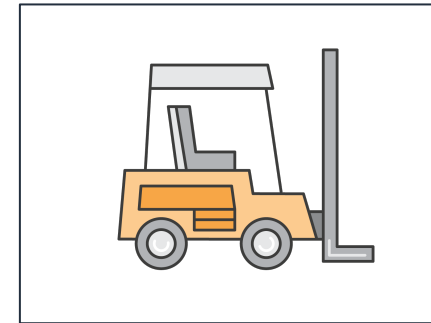
Mobilize



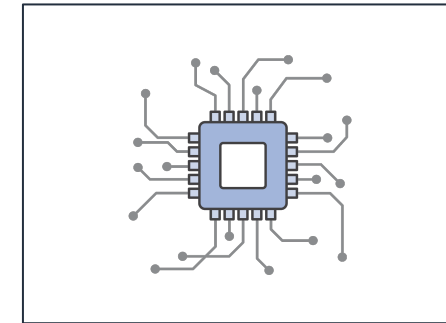
**Retire**



**Retain**



**Relocate**



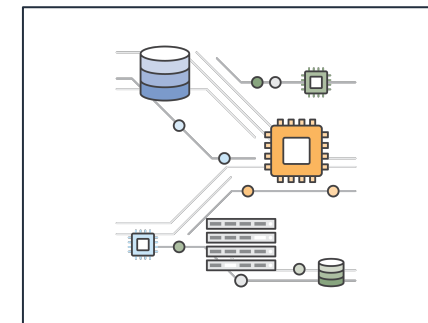
**Rehost**



**Repurchase**



**Replatform**



**Refactor**

# Migration process: Migrate and modernize



Assess



Mobilize



Migrate & modernize



# Migration customer journey



Migrate & modernize

Assess ✓

Mobilize ✓

Migrate & modernize

**CART/Migration readiness assessment (MRA)/TSO Logic**

**Rapid migration business case (RMBC)**



Rapid discovery



TCO report

**Pre-MRP accelerators**



Briefings & workshops



Immersion day



Discovery and planning



Landing zone



Skills / center of excellence



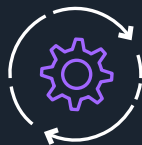
Migration experience



Business case / TSO Logic



Migration plan



Operating model



Security and compliance

Migrate



Operate



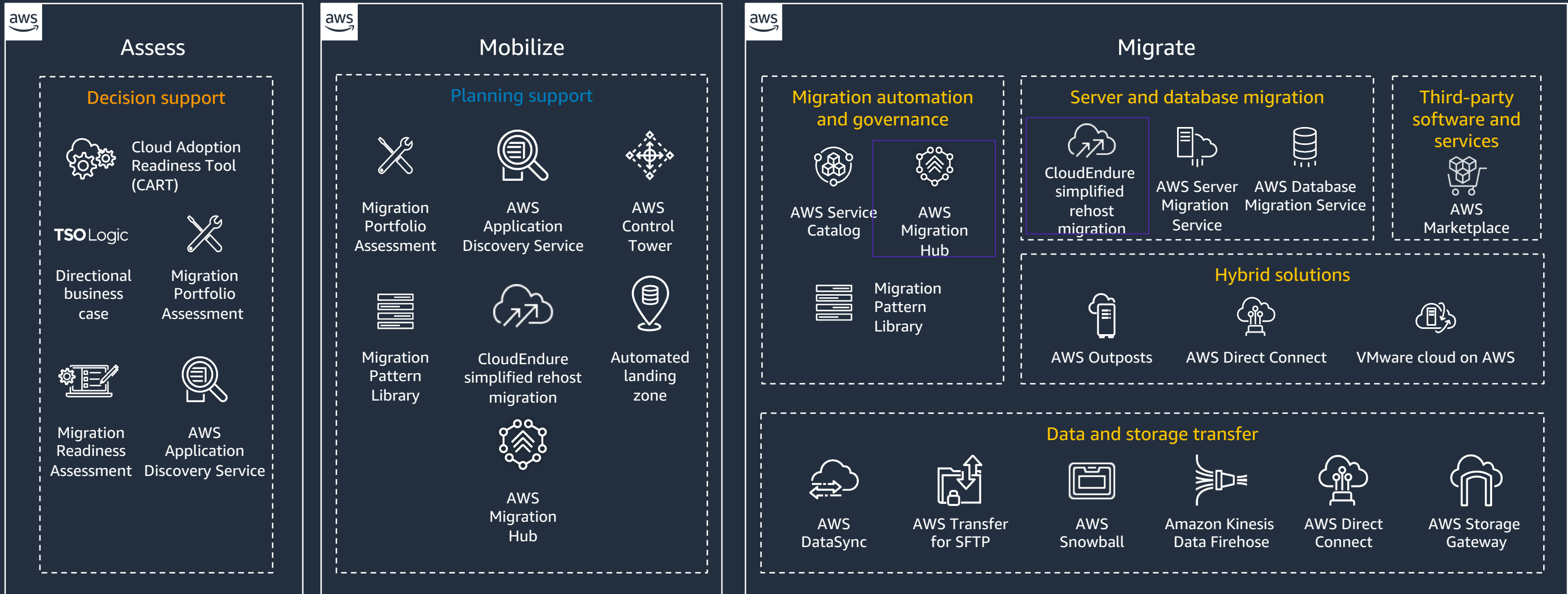
Modernize



# Broadest and deepest set of capabilities to accelerate your migration



Migrate & modernize



# Using a Readiness Assessment to build an Action Plan



- Questions to identify readiness and gaps to migrate at scale
- Followed by an action plan proposal to close the gaps (e.g. Accelerators, a Mobilize project plan by ProServe / partner)

Business Capability Focused	<b>Business</b> Value Realization
	<b>People</b> Roles and Readiness
	<b>Governance</b> Prioritization and Control
Technical Capability Focused	<b>Platform</b> Applications and Infrastructure
	<b>Security</b> Risk and Compliance
	<b>Operations</b> Hybrid and Dynamic

<b>Business Case</b>	2.9
High Level Business Case	2.3
Key Stakeholder Sign-off	4.0
Migration Funding Commitment	4.0
Specific Migration Workloads Committed	3.0
Detailed Business Case	1.0
<b>Customer Migration Project Plan</b>	1.7
Determine Delivery Model & Approach	2.0
Project Management Capability	1.0
Migration Plan	2.0
<b>Skills &amp; COE</b>	2.0
Single Threaded Leader	5.0
COE Resource Commitment	2.0
Experience baseline	1.7
Design or Evolve COE	1.0
Organizational Training	1.0
<b>Landing Zone</b>	3.0
AWS Master Account/Sub-Accounts	2.0
Account Design & Configuration	4.0
Existing Network & Data Center Architecture	3.0
<b>Application Portfolio Discovery &amp; Planning</b>	2.3
Application Discovery Data	2.2
Server & Infrastructure Discovery Data	2.0
Workload Owner Buy-In or Alignment	2.7
Migration Scope Scored & Targeted for Optimization	2.0
<b>Migration Process &amp; Experience</b>	2.0
Identification of Pilot Applications	3.0
Migration Experience	1.0

Lightweight version available for everyone:

<https://cloudreadiness.amazonaws.com/#/cart>



# Migration process: Mobilize



Assess



Mobilize



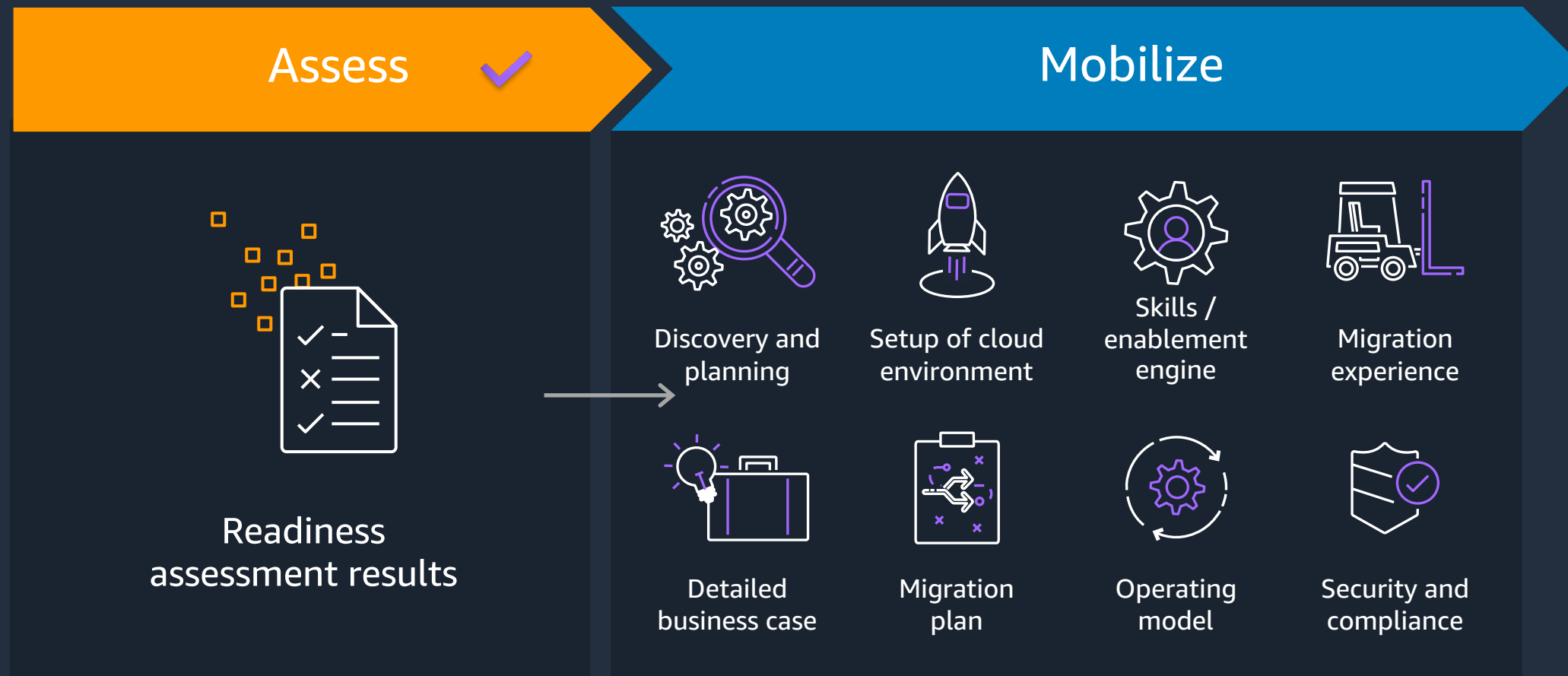
Migrate & modernize



# Use assessment results to improve your migration readiness and planning, and mobilize resources



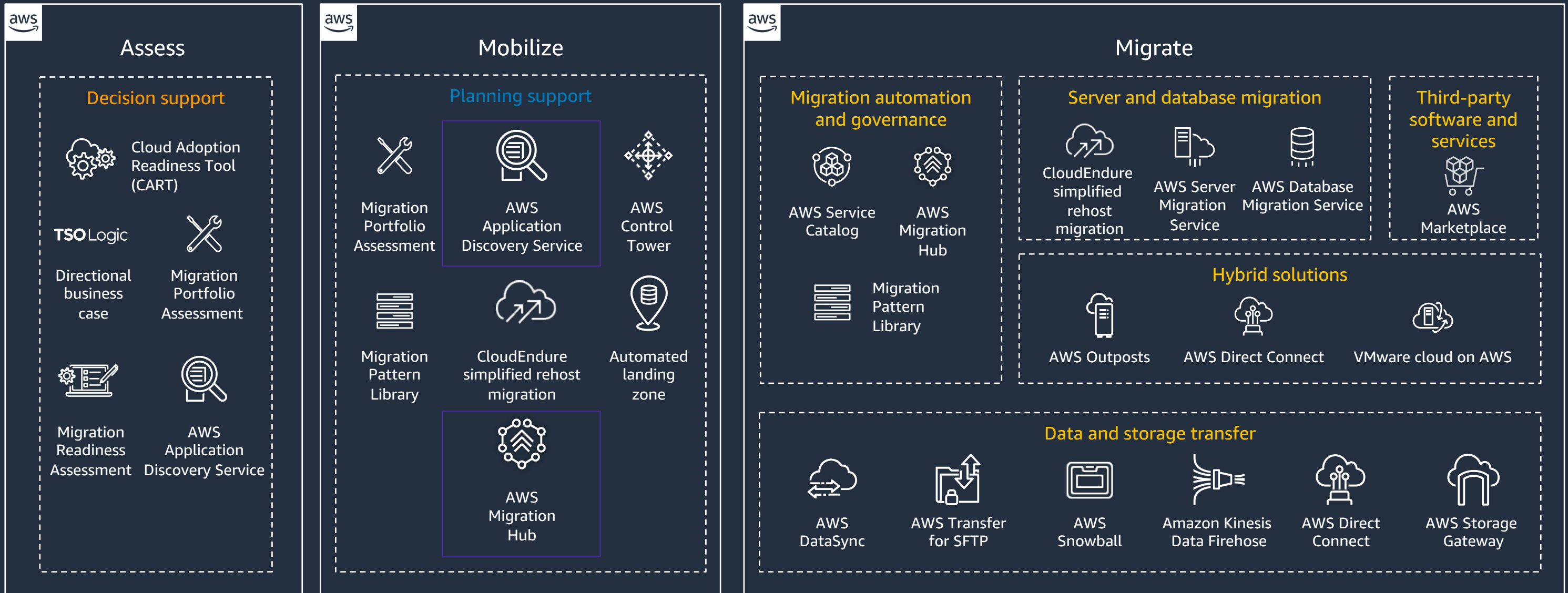
Mobilize



# Broadest and deepest set of capabilities to accelerate your migration



Mobilize

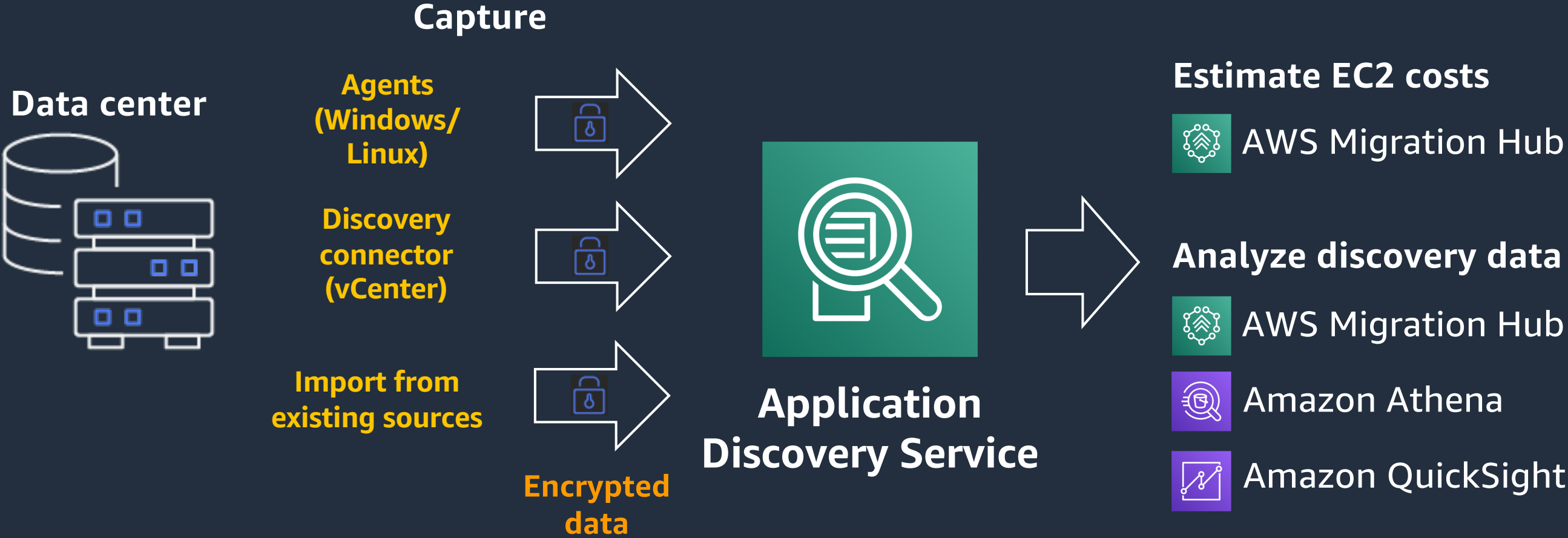




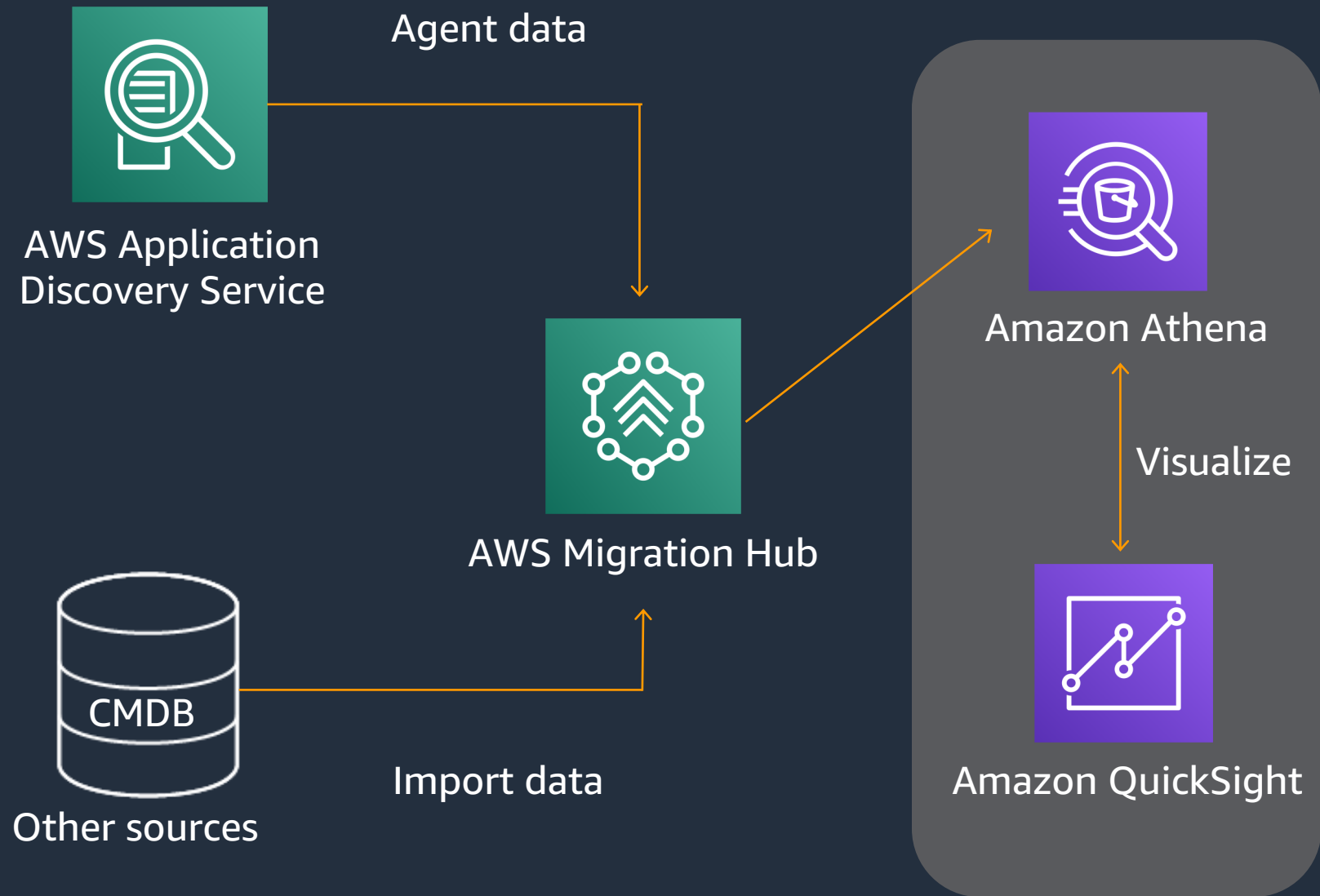


# How to perform discovery

Capture and visualize system inventory, performance, and dependencies



# Migration planning using Athena and Amazon QuickSight



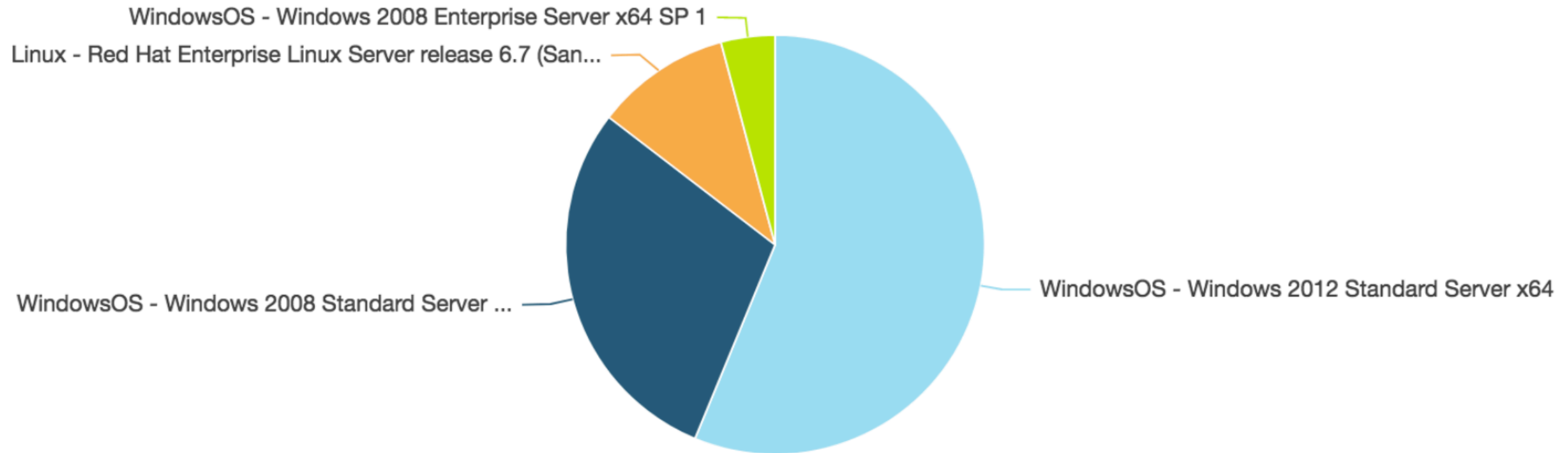
- 1) Validate data completeness
- 2) Analyze utilization metrics
- 3) Identify running software
- 4) Analyze interdependencies
- 5) Group servers into applications
- 6) Migrate and track applications



# Operating system info in Amazon QuickSight



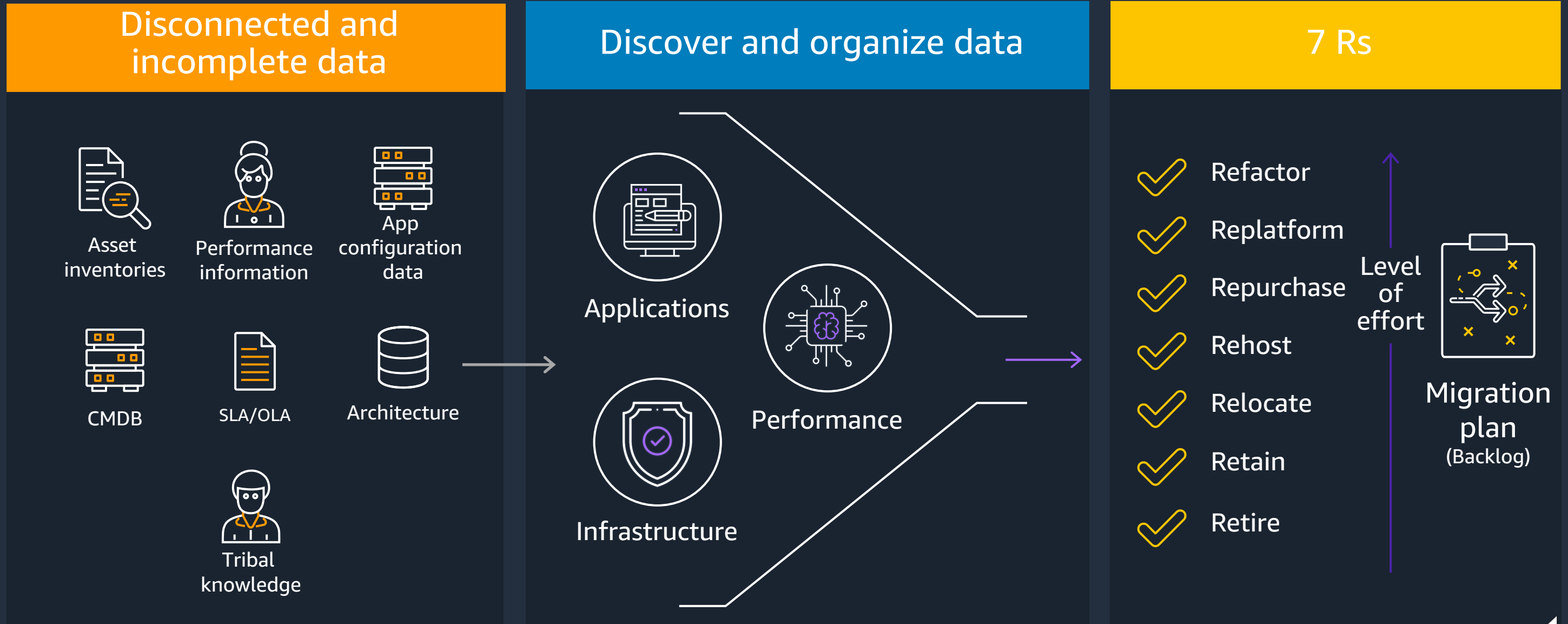
Mobilize



# Determine the right migration pattern for your apps



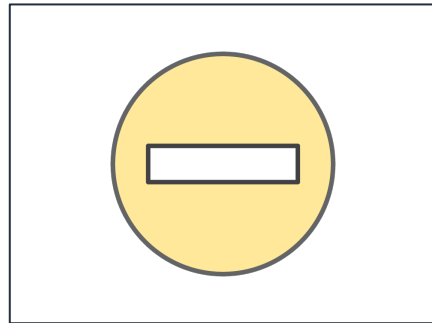
Mobilize



# R's explained



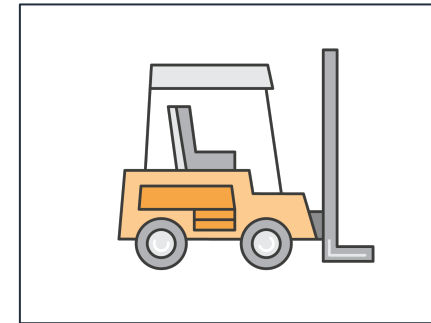
Mobilize



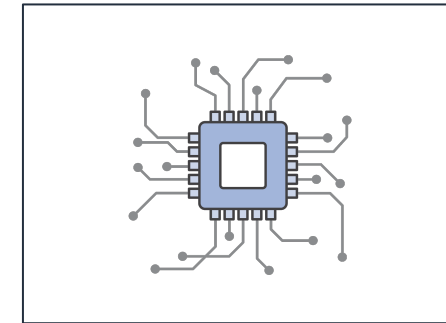
**Retire**



**Retain**



**Relocate**



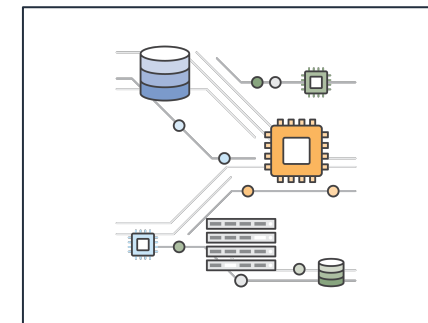
**Rehost**



**Repurchase**



**Replatform**



**Refactor**

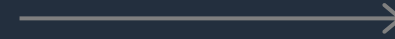
# Migration process: Migrate and modernize



Assess



Mobilize



Migrate & modernize



# Migration customer journey



Migrate & modernize

Assess ✓

Mobilize ✓

Migrate & modernize

**CART/Migration readiness assessment (MRA)/TSO Logic**

**Rapid migration business case (RMBC)**



Rapid discovery



TCO report

**Pre-MRP accelerators**



Briefings & workshops



Immersion day



Discovery and planning



Landing zone



Skills / center of excellence



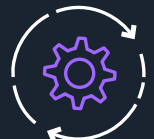
Migration experience



Business case / TSO Logic



Migration plan



Operating model



Security and compliance

Migrate



Operate



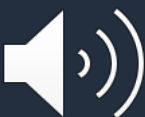
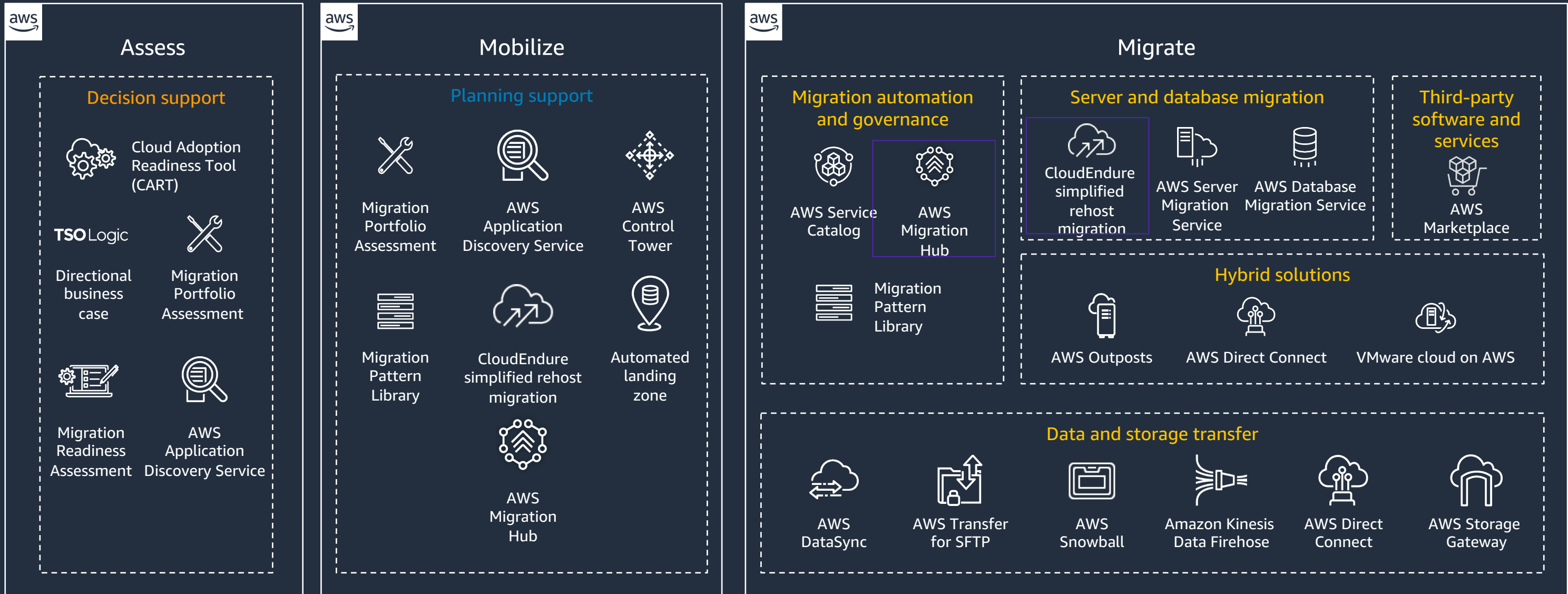
Modernize



# Broadest and deepest set of capabilities to accelerate your migration



Migrate & modernize





# Common migration challenges

- Diverse infrastructure and OS types
- Legacy applications
- Complex databases
- Busy, continuously changing workloads
- Machine compatibility issues
- Expensive specialized cloud skills required
- Downtime and performance disruption
- Tight project timelines and limited budgets

# Simplify migration with CloudEndure

## Flexible



Migrate From Any Source



Wide Range of OS, Application, and Database Support



Option to Migrate Back

## Reliable



Robust, Predictable, Non-Disruptive Continuous Replication



Short Cutover Windows With Minimal Downtime



Highly Secure for Regulated Environments

## Highly Automated



Minimal Skill Set Required to Operate



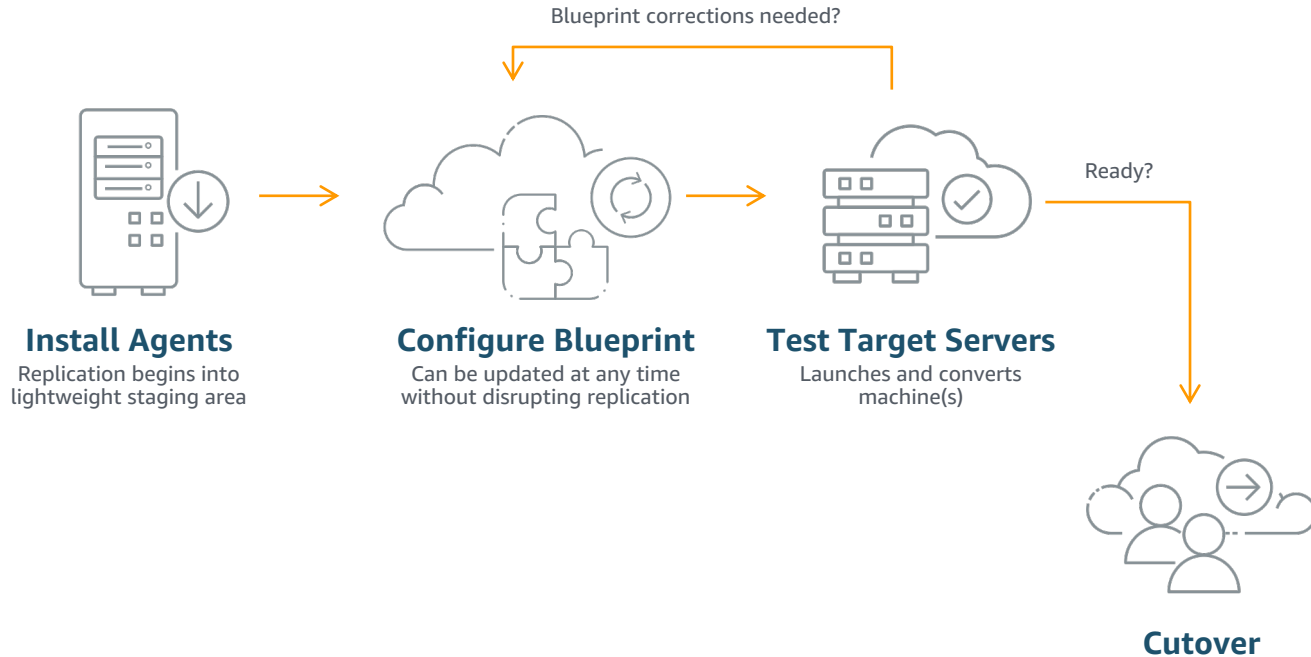
Easy, Non-Disruptive Tests Prior to Cutover



Easily Plugs Into Migration Factories and Cloud COEs

- Designed especially for rapid, mass-scale migrations
- Simple setup lets you start in minutes
- Same highly automated process for any workload (regardless of OS type/version, application, or DBs)
- Eliminates complexity and reduces risk
- Migrate with minimal business disruption

# Automate and accelerate migration to the cloud



# Migrations on time, without disruption



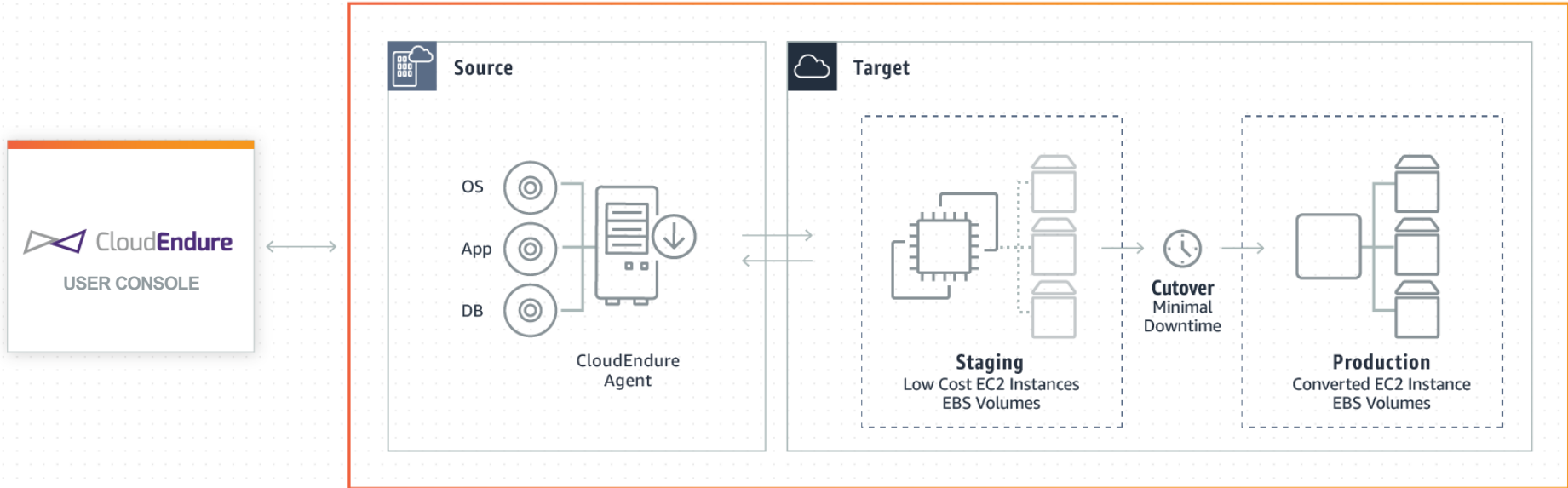
- Thousands of physical and virtual servers running different OS types and versions
- Seamlessly migrated off-the-shelf applications at scale
- Met their accelerated migration timeline
- Achieved significant cost savings by retiring legacy infrastructure



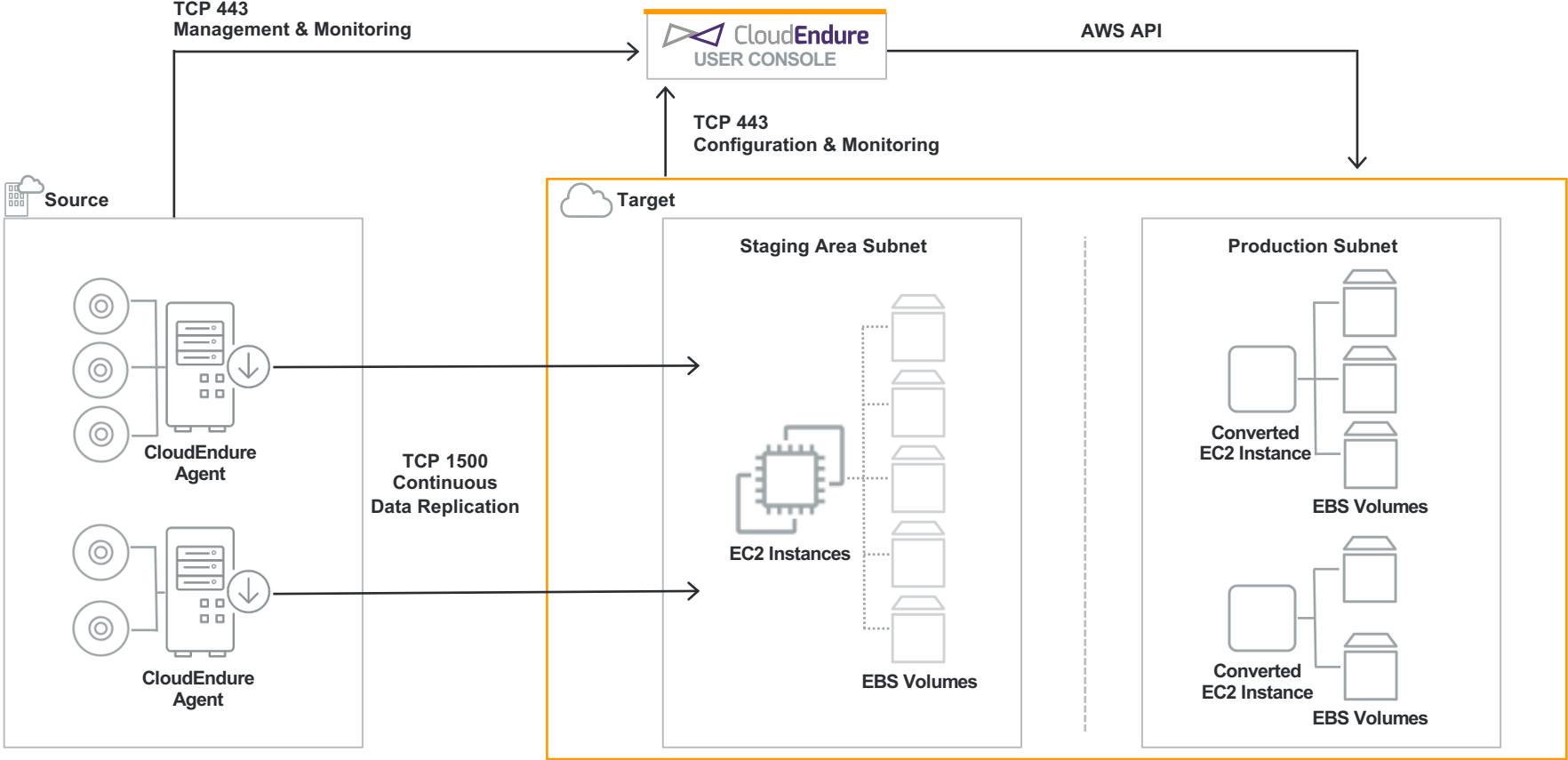
- Migrated 1,000 Windows servers from on-premises data centers to AWS
- Supported their entire environment and all workloads
- Achieved cutover windows of minutes
- Completed on schedule and without performance disruption

# How CloudEndure Migration works

- CloudEndure continuously replicates any application or database from any source into AWS
- Business outcome: Allow self-service, rapid, reliable migrations with minimal business disruption



# Network architecture



# Wide platform support

Any  
Application



Any  
Database



x86 Operating  
Systems



Source  
Infrastructure



See documentation or contact Support for a complete list

# CloudEndure Migration Demo



# It's easy to build on top of CloudEndure

## CloudEndure RESTful APIs

Secure | [https://console.cloudendure.com/api\\_doc/apis.html#tag/blueprint%2Fpaths%2F~1projects~1%7BprojectId%7D~1bl](https://console.cloudendure.com/api_doc/apis.html#tag/blueprint%2Fpaths%2F~1projects~1%7BprojectId%7D~1bl)

Search

GENERAL

BLUEPRINT

- Get Blueprint
- Configure Blueprint
- Create Blueprint
- List Blueprints

ACTIONS

USER

AUTHENTICATION

MACHINES

REPLICATION

instanceType	string Possible values can be fetched from the Region object.
placementGroup	string AWS only. Possible values can be fetched from the Region object.
networkAdapterType	string Currently relevant for vCenter cloud only. Possible values can be fetched from the Region object.
mbRam	integer MB RAM per Target machine; Currently relevant for vCenter cloud only; Max value can be fetched from the maxMbRamPerMachine property of the Region object.
disks	object AWS only. Target machine disk properties.
staticIpAction	string Valid values: "EXISTING" "DONT_CREATE" "CREATE_NEW" "IF_IN_ORIGIN"
subnetIDs	Array of string AWS only. Configures a subnets in which the instance network interface will take part. Possible values can be fetched from the

## Common integration use cases

- Automated agent deployment
- Settings blueprints
- Automated machine launch
- Simplifies automated application testing
- Post-launch software removal/deployment and configuration

# Keys to a successful implementation

	What to do	Why is this important
Implementation	<ol style="list-style-type: none"><li>1. Identify the Source machines</li><li>2. Group into waves</li><li>3. Set cutover date for each wave</li></ol>	Better resource allocation and project continuity
Initial Replication	<ol style="list-style-type: none"><li>1. Install Agents in stopped mode</li><li>2. Start the replication, each wave at the time</li></ol>	Avoid network overloading Decrease IT overhead
Continuous Replication	Confirm replication reaches ' <b>Continuous Data Protection</b> ' mode (CDP)	Only after initial replication has completed can the target machine be launched
Testing	Test target machines 1-2 weeks before the actual cutover	Leave time to address any issues that may come up
Cutover	Verify CDP mode	Minimize cutover downtime

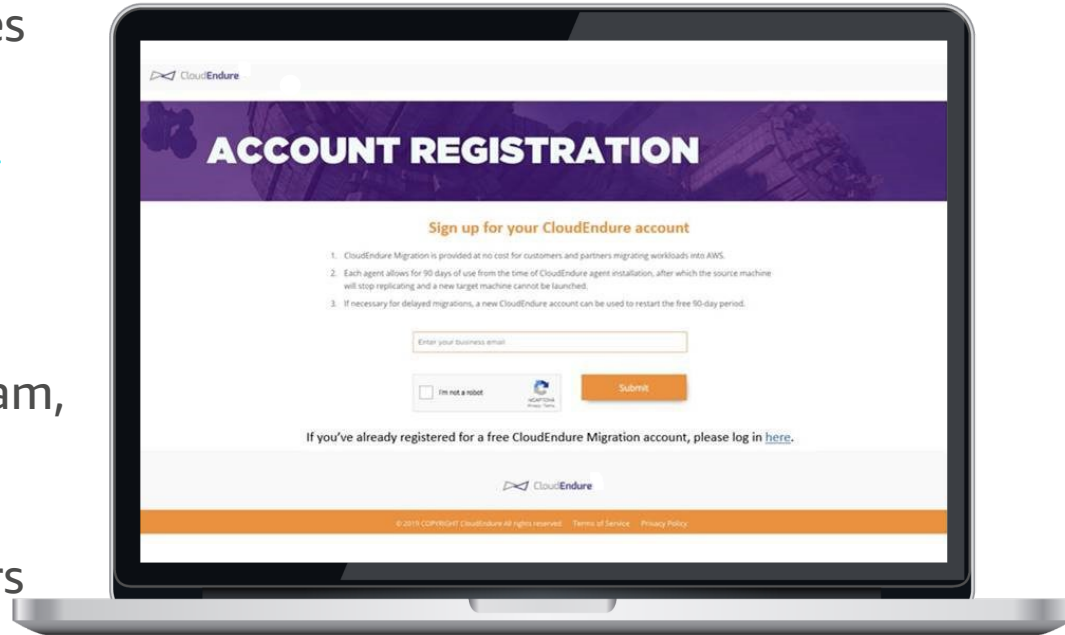
# Use cases

- Lift-and-shift, then optimize
- Vast majority of Windows / Linux servers when agent can be installed on source machines
- On-premise to AWS, cloud to cloud, cross-region
- Replicating block storage devices: SAN, iSCSI, physical, EBS, VMDK, VHD...
- Replicating full machines / volumes



# CloudEndure Migration license model

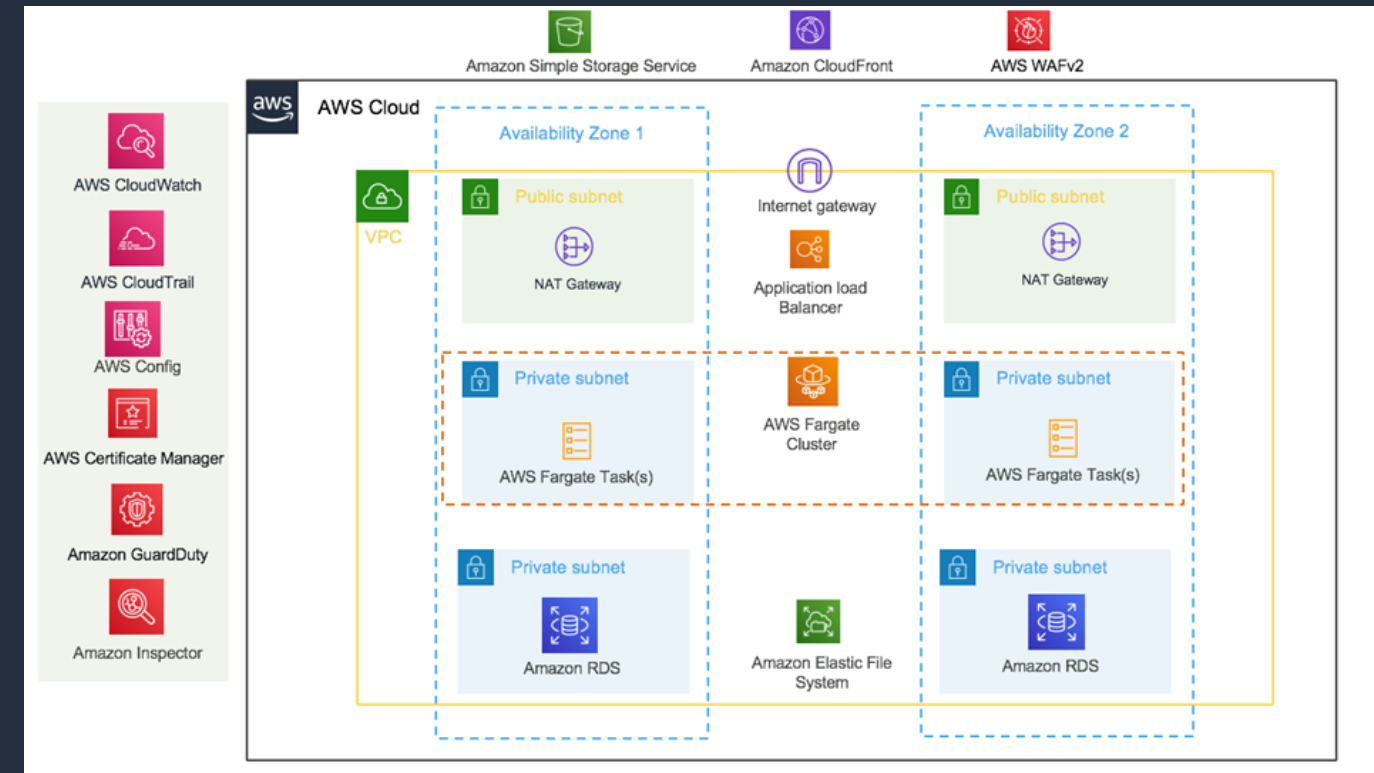
- Get your free migration licenses at [aws.amazon.com/cloudendure](https://aws.amazon.com/cloudendure)
- Each license – one per source machine – is valid for 90 days
- For assistance contact your consulting partner, account team, or AWS Professional Services
- Additional program benefits available to qualified customers and partners



# Self-paced AWS Application Migration Workshop

Self-paced 2-hour hands-on migration to AWS that covers:

- Re-hosting with AWS CloudEndure Migration
- Re-platforming with AWS Database Migration Service
- Modernization with containers on AWS Fargate
- Tips for further optimization of architecture according to AWS Well-Architected



<http://application-migration-with-aws.workshop.aws/>



# Do your readiness assessment and learn the methodology

100+ runbooks and strategies to migrate quickly

<https://aws.amazon.com/prescriptive-guidance/>

Take the quick Readiness Assessment and start the Transformation

<https://cloudreadiness.amazonaws.com/#/cart>



# Thank you

