



AWS
re:Invent

ENT307-R

Strategies and tools to migrate hundreds of applications

Carmen Puccio

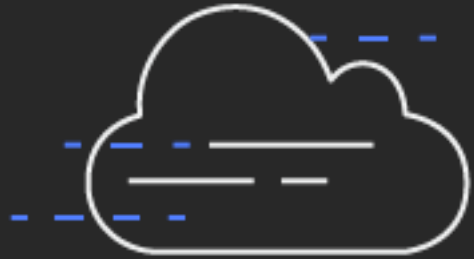
Principal Solutions Architect
AWS Partner Program
Amazon Web Services

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Distinguished Engineer
National Australia Bank

The migration opportunity & approach

Migration – Current landscape



The public cloud
is becoming an
enterprise strategic
imperative

The “tire kicking”
has stopped



There is still work to
be done

Globally \$2T is
dedicated to
maintenance and
keeping the lights on



Future-proof your
business

Move forward to realize
the opportunities to
grow, succeed, and
advance your
organization



Customers
need help

Where do I start?

Migration approach and questions



Migration preparation & business case

- What are my current costs?
- What is the cost to migrate?



Portfolio discovery & planning

- My CMDB is out of date
- What are my application dependencies?
- I don't know my utilization or what's running?
- What, how, and when should I migrate?



Application design, migration & validation

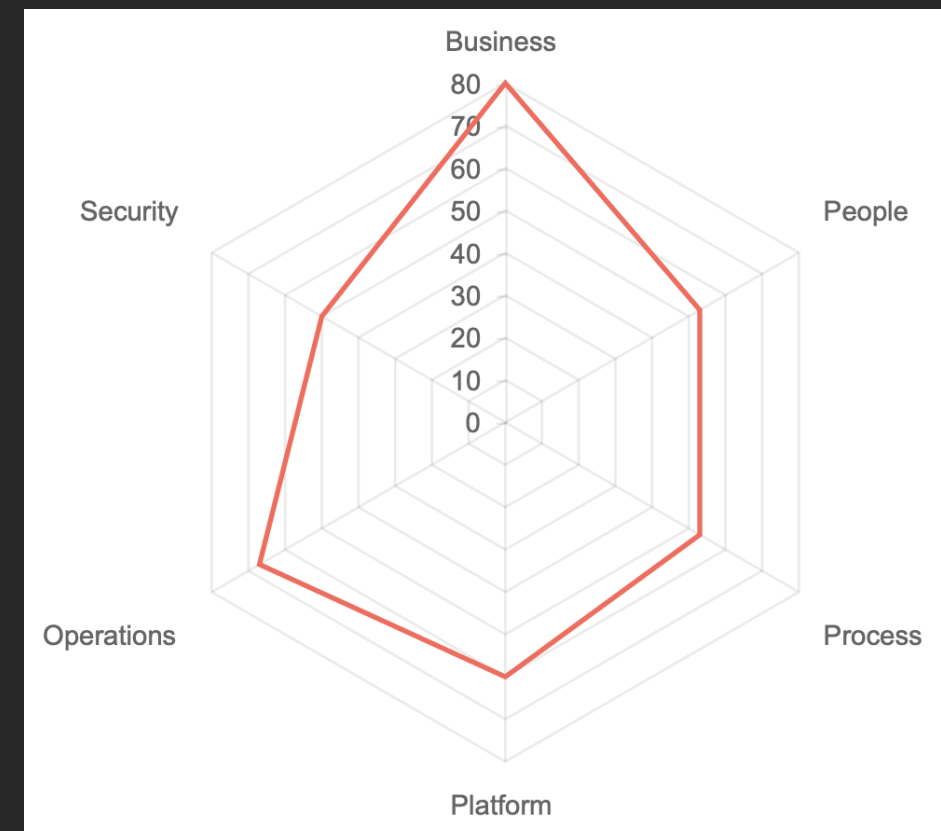
- Different workloads require different tools
- How do I know an app migration is complete?
- How do I track progress without slowing down?

Assessment – Develop a business case for migration

TSO Logic

Delivers accurate data-driven recommendations to right-size and right-cost compute

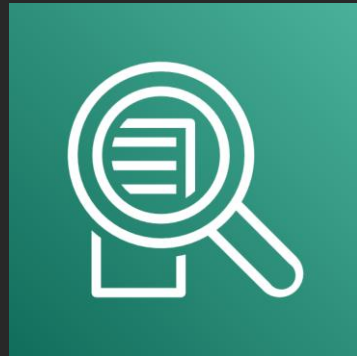
AWS Cloud Adoption Readiness Tool (CART)



Readiness & planning



AWS Migration
Hub



AWS Application
Discovery
Service



AWS Schema
Conversion
Tool

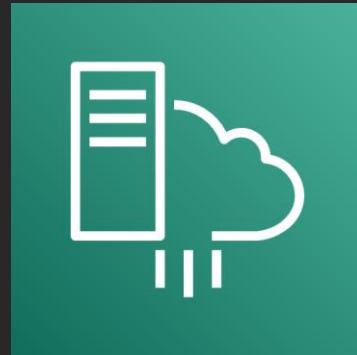


AWS Landing Zone

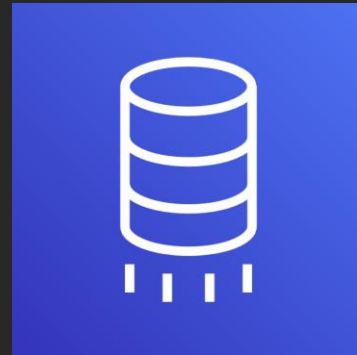


AWS Control
Tower

Migrations – Services for migrating servers, databases, and applications



AWS Server
Migration Service
(AWS SMS)



AWS Database
Migration Service
(AWS DMS)



VMware Cloud
on AWS

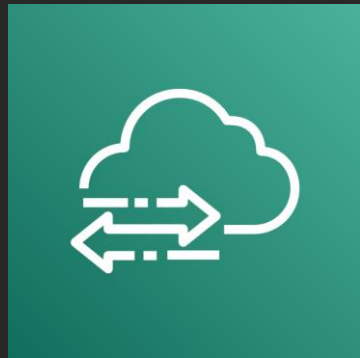


AWS
Marketplace

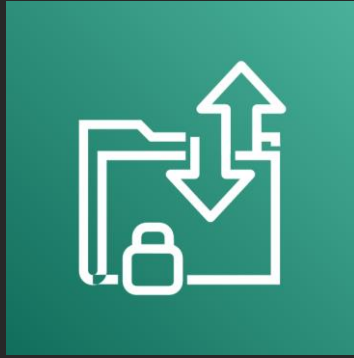
Migrations – Services for data transfer



AWS Storage
Gateway



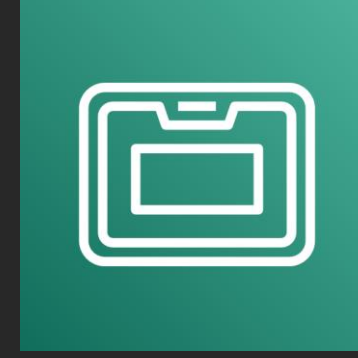
AWS DataSync



AWS Transfer
for SFTP



AWS Direct
Connect



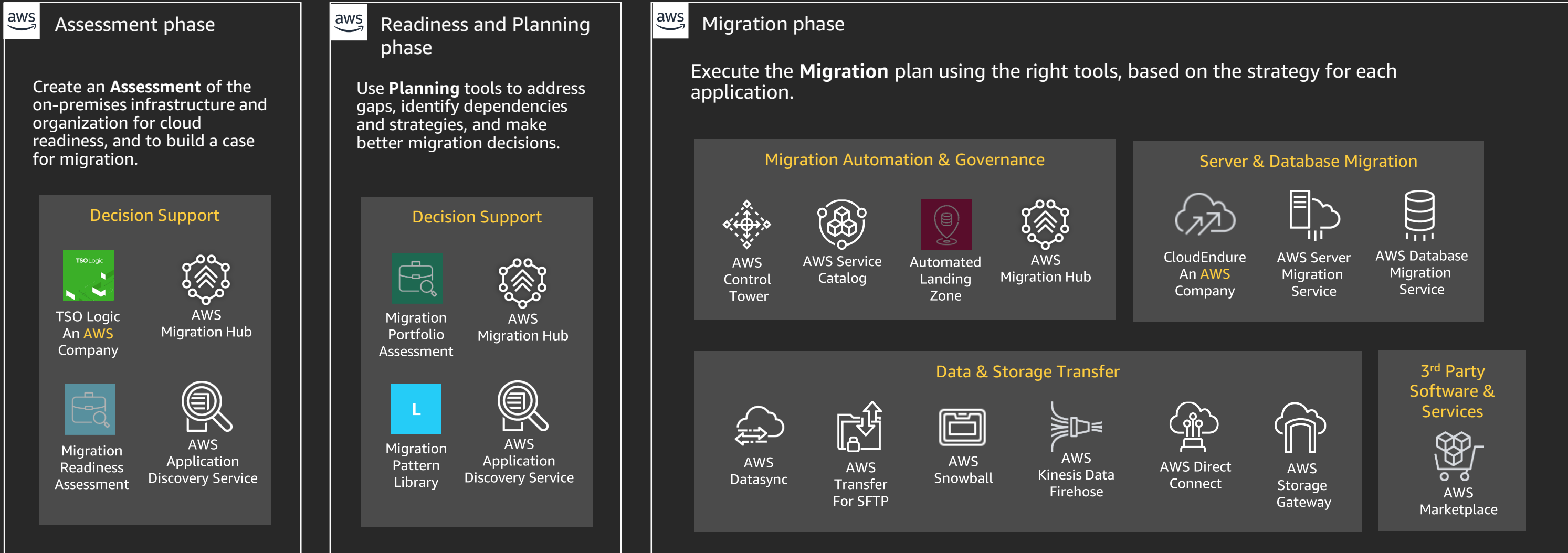
AWS Snowball



Snowball Edge

AWS Migration Tooling supports all phases of the journey

Tools accelerate the migration process by providing guidance and automating steps.



How to perform discovery

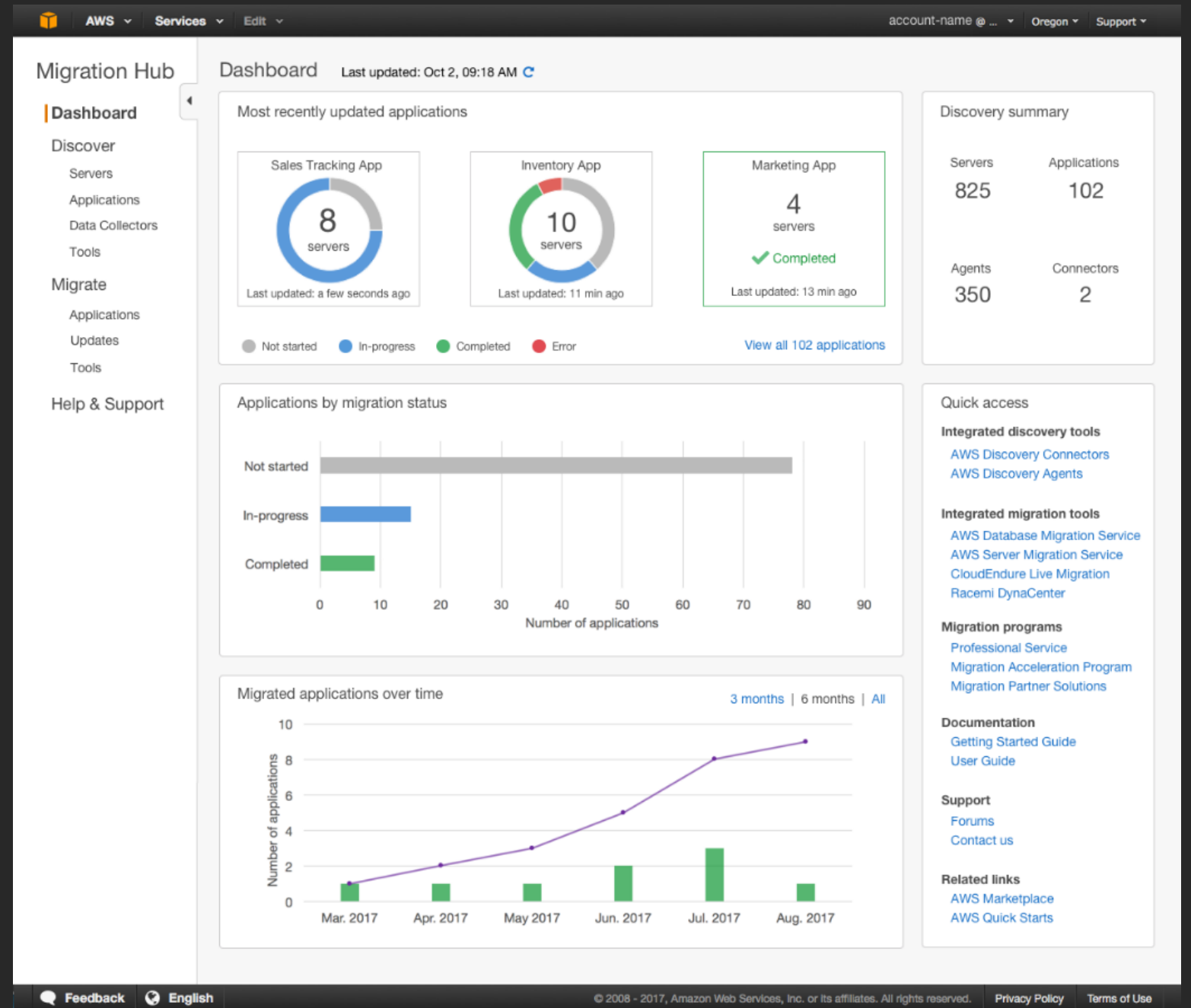
AWS Migration Hub

Track the migration status of your applications across multiple tools in one place

Discover using Application Discovery Service or import discovery data from existing sources

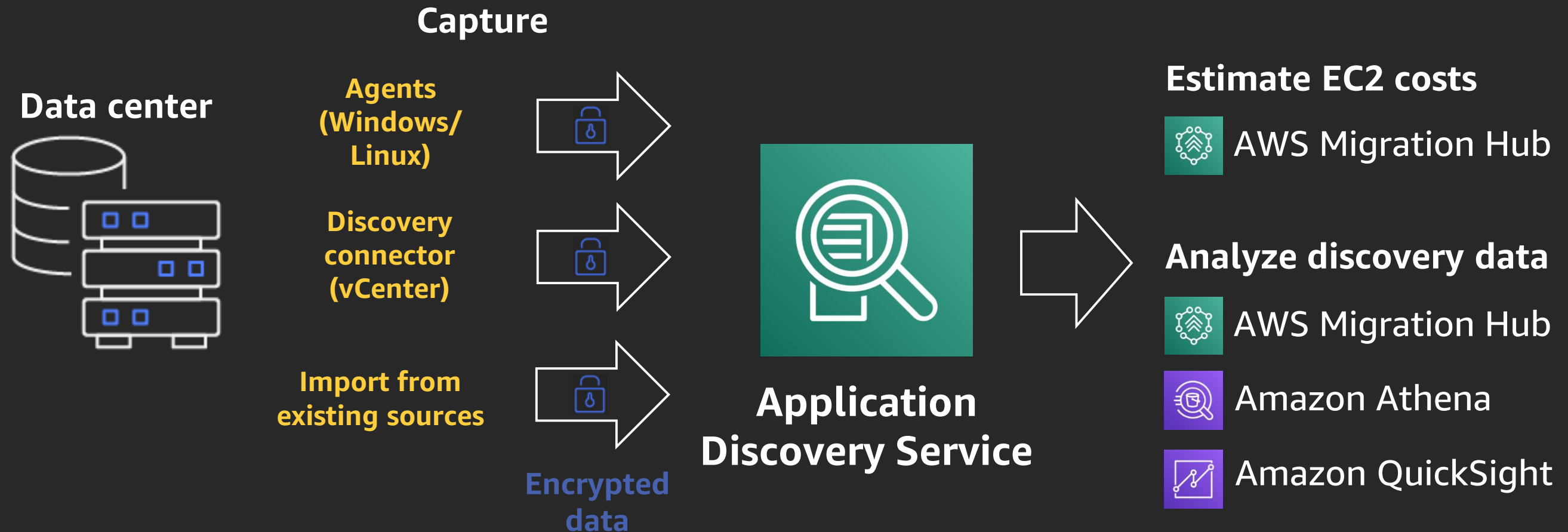
Use the migration tools that best fit your needs – AWS or Partner tools integrated

Available to all AWS customers at no additional charge

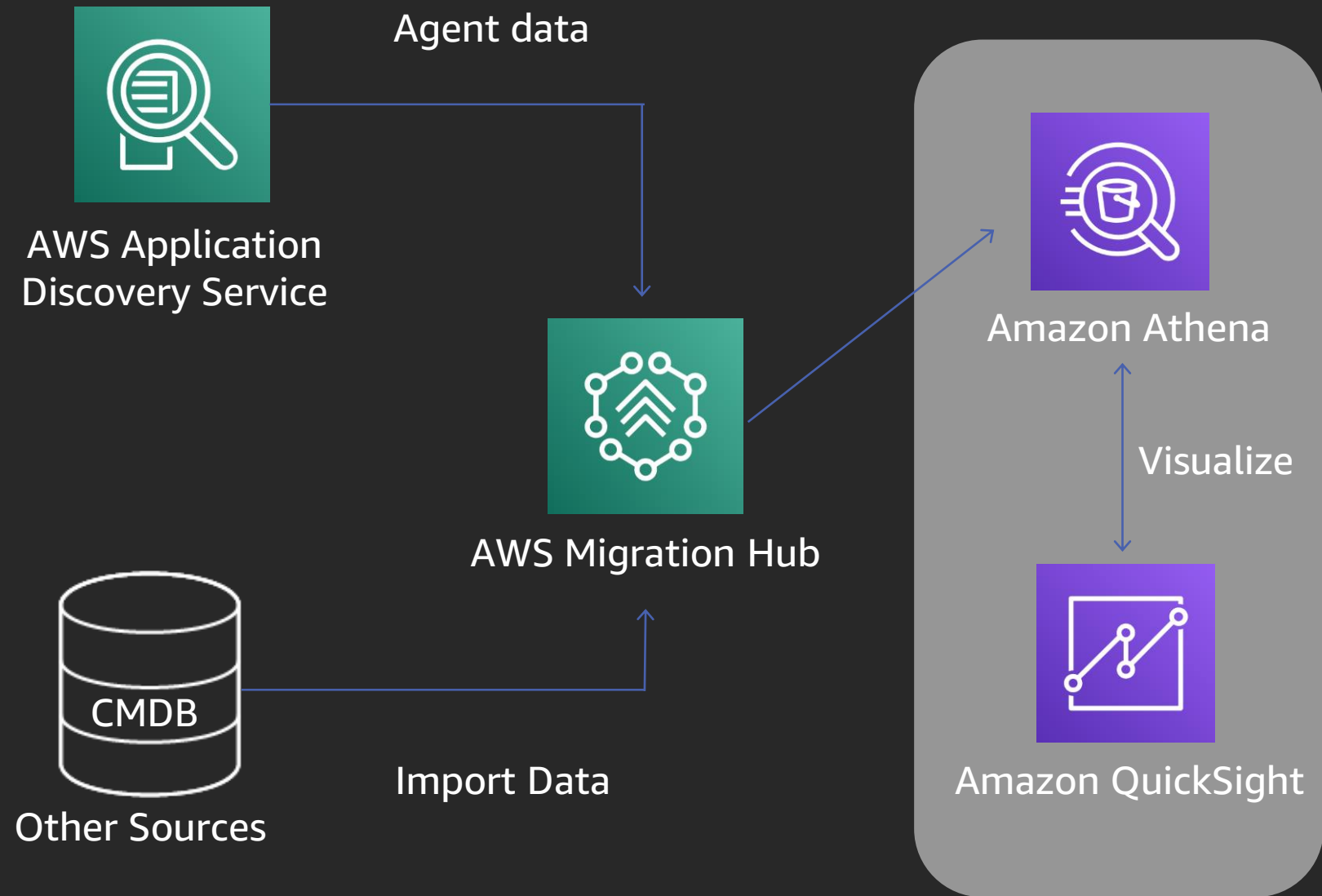


How to perform discovery

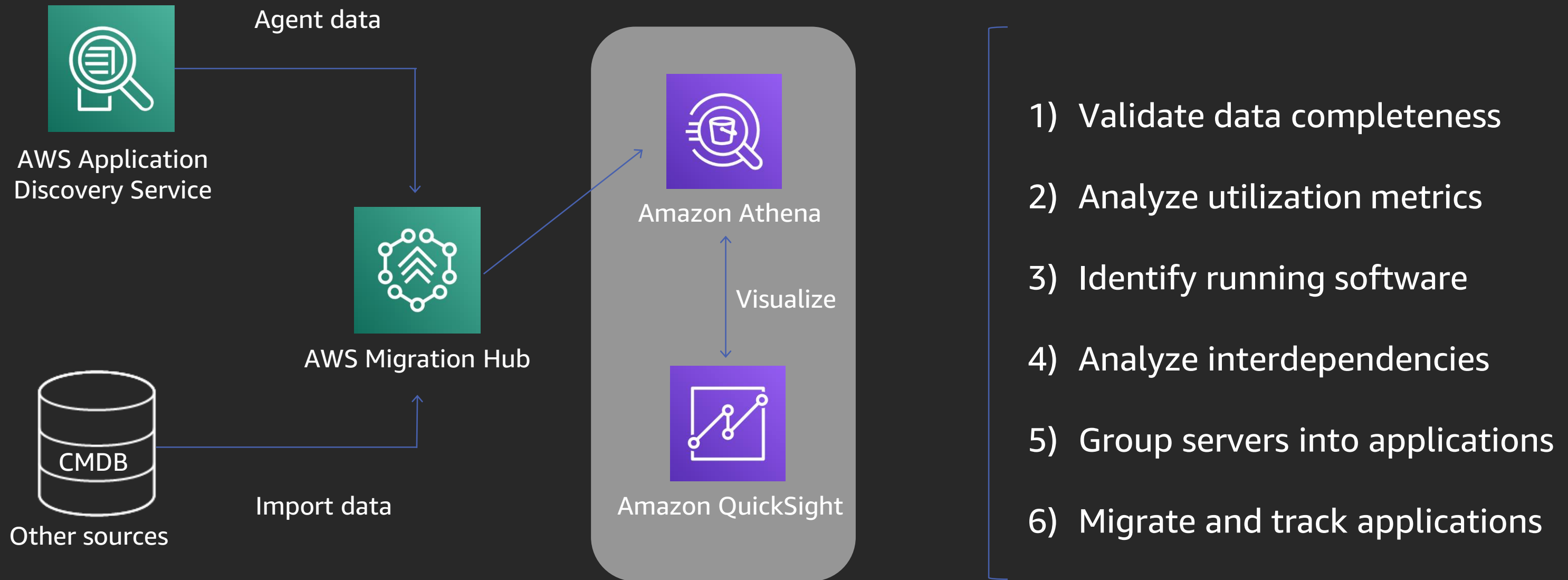
Capture and visualize system inventory, performance, and dependencies



Migration planning using Athena and Amazon QuickSight



Migration planning using Athena and Amazon QuickSight



Application Discovery Service database in Athena

- Hosts & operating systems
- Network interfaces
- Processes
- System performance
- Network connections

os_info_agent	processes_agent	sys_performance_agent
account_number agent_id os_name os_version cpu_type host_name hypervisor timestamp	account_number agent_id agent_assigned_process_id is_system name cmd_line path agent_provided_timestamp	account_number agent_id total_disk_bytes_read_per_sec_in_kbps total_disk_bytes_written_per_sec_in_kbps total_disk_read_ops_per_sec total_disk_write_ops_per_sec total_network_bytes_read_per_sec_in_kbps total_network_bytes_written_per_sec_in_kbps total_num_logical_processors total_num_cores total_num_cpus total_num_disks total_num_network_cards total_cpu_usage_pct total_disk_size_in_gb total_disk_free_size_in_gb total_ram_in_mb total_free_ram_in_mb timestamp
inbound_connection_agent	network_interface_agent	
account_number agent_id source_ip source_port destination_ip destination_port ip_version transport_protocol timestamp	account_number agent_id name mac_address family ip_address gateway net_mask agent_provided_timestamp	

application_discovery_service_database

Operating system info in Amazon Athena

os_info
account_number
agent_id
os_name
os_version
cpu_type
host_name
hypervisor
timestamp

```
SELECT      os_name,  
              COUNT(DISTINCT host_name)  
  
FROM        os_info  
  
GROUP BY    os_name
```

Operating system info in Amazon Athena

os_info
account_number
agent_id
os_name
os_version
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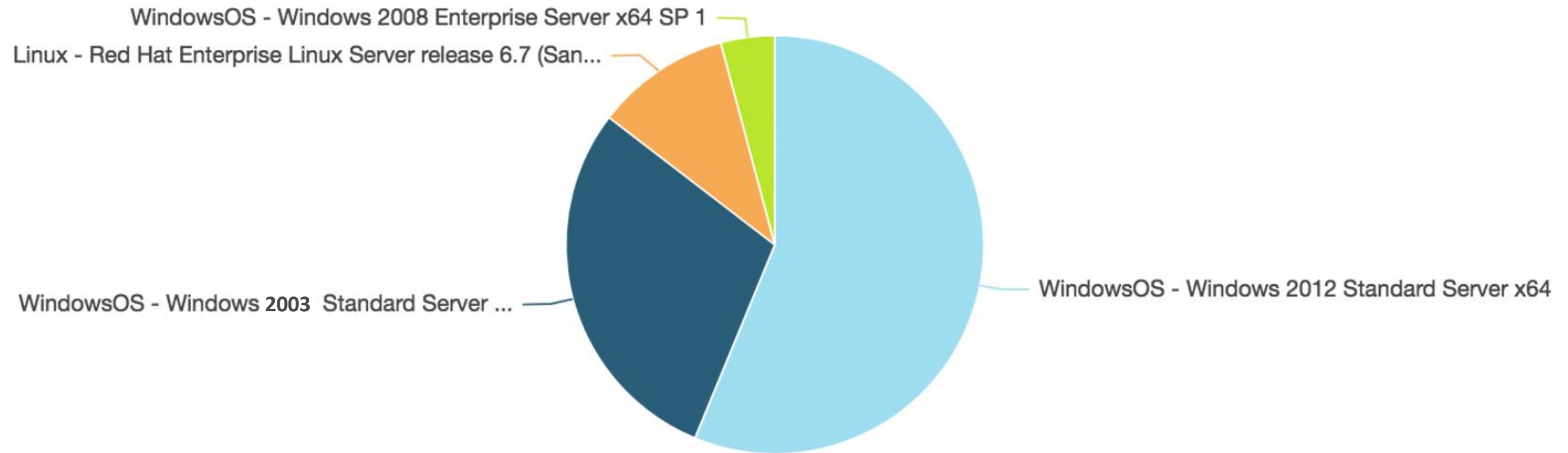
```
SELECT      os_name,
            COUNT(DISTINCT host_name)

FROM        os_info

GROUP BY    os_name
```

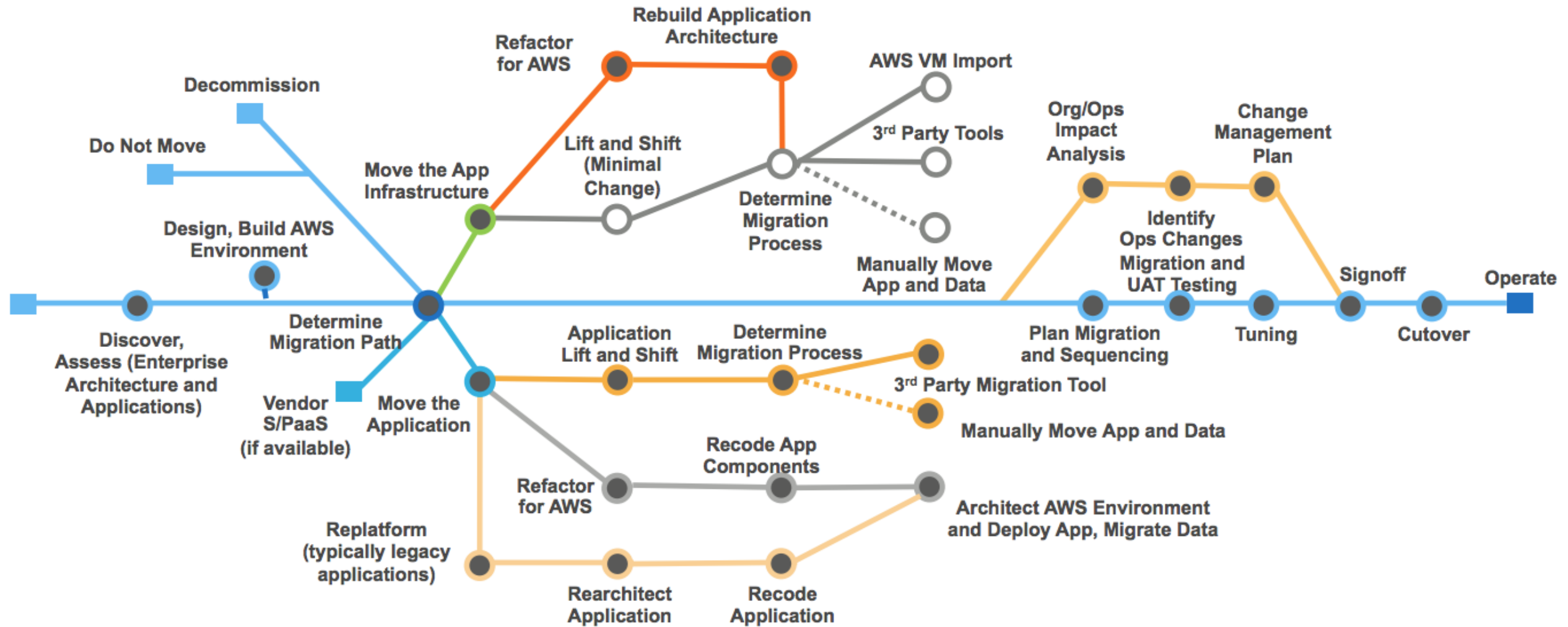
os_name	Count
Linux – RedHat Enterprise Linux Server release 6.7 x86_64	5
WindowsOS – Windows 2003 Standard Server x64 R2 SP2	14
WindowsOS – Windows 2008 Enterprise Server x64 SP 1	2
WindowsOS – Windows 2012 Standard Server x64	27

Operating system info in Amazon QuickSight



How to migrate

Paths to migration



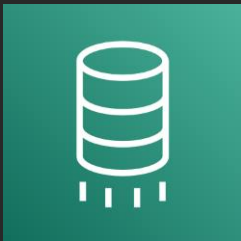
Migration tools integrated with AWS Migration Hub

With SMS, Import VM images from your existing environment to ready-to-use Amazon EC2 instances



AWS Server Migration Service

AWS DMS helps you migrate databases to AWS easily and securely



AWS Database Migration Service

ATAMotion auto-migrates live workloads directly to your VPC from any physical, virtual or cloud source, without installing agents.

ATAMotion

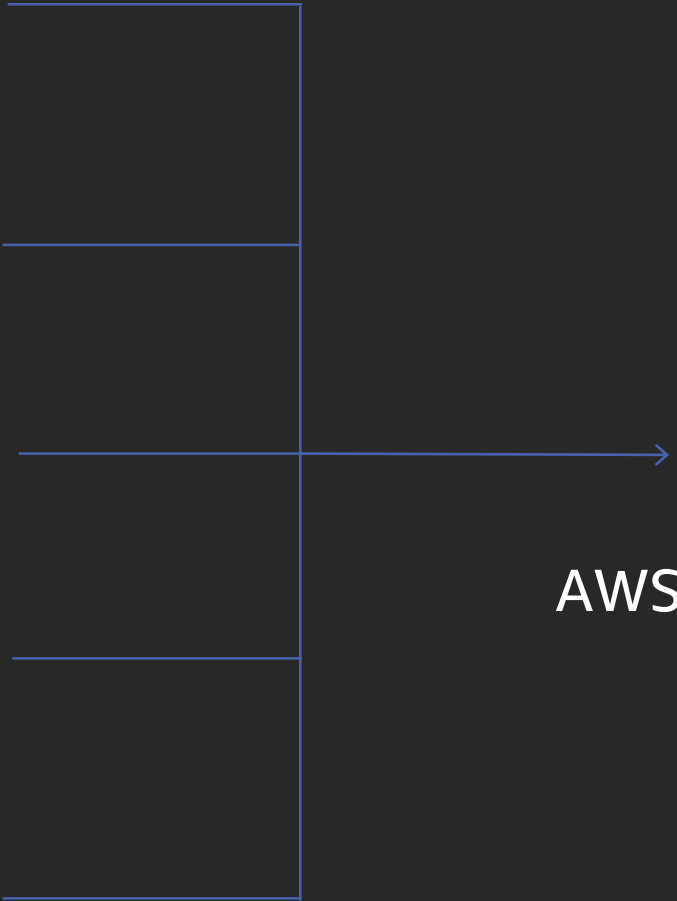
CloudEndure Live Migration provides automated migration to AWS from any physical or virtual infrastructure



RiverMeadow Server Migration SaaS provides high performance and secure workload migrations into Amazon Virtual Private Cloud (Amazon VPC) environments.

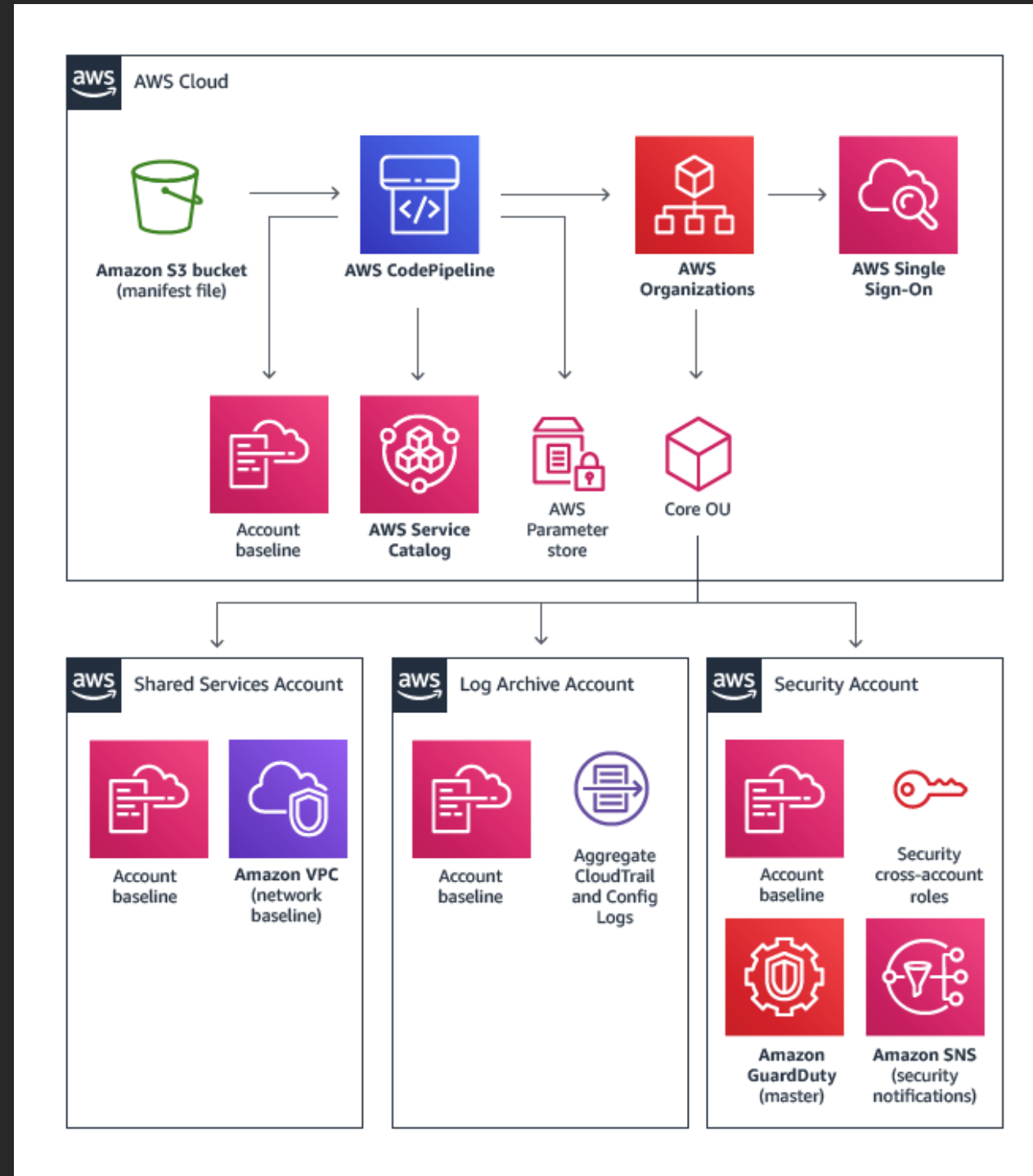


AWS Migration Hub



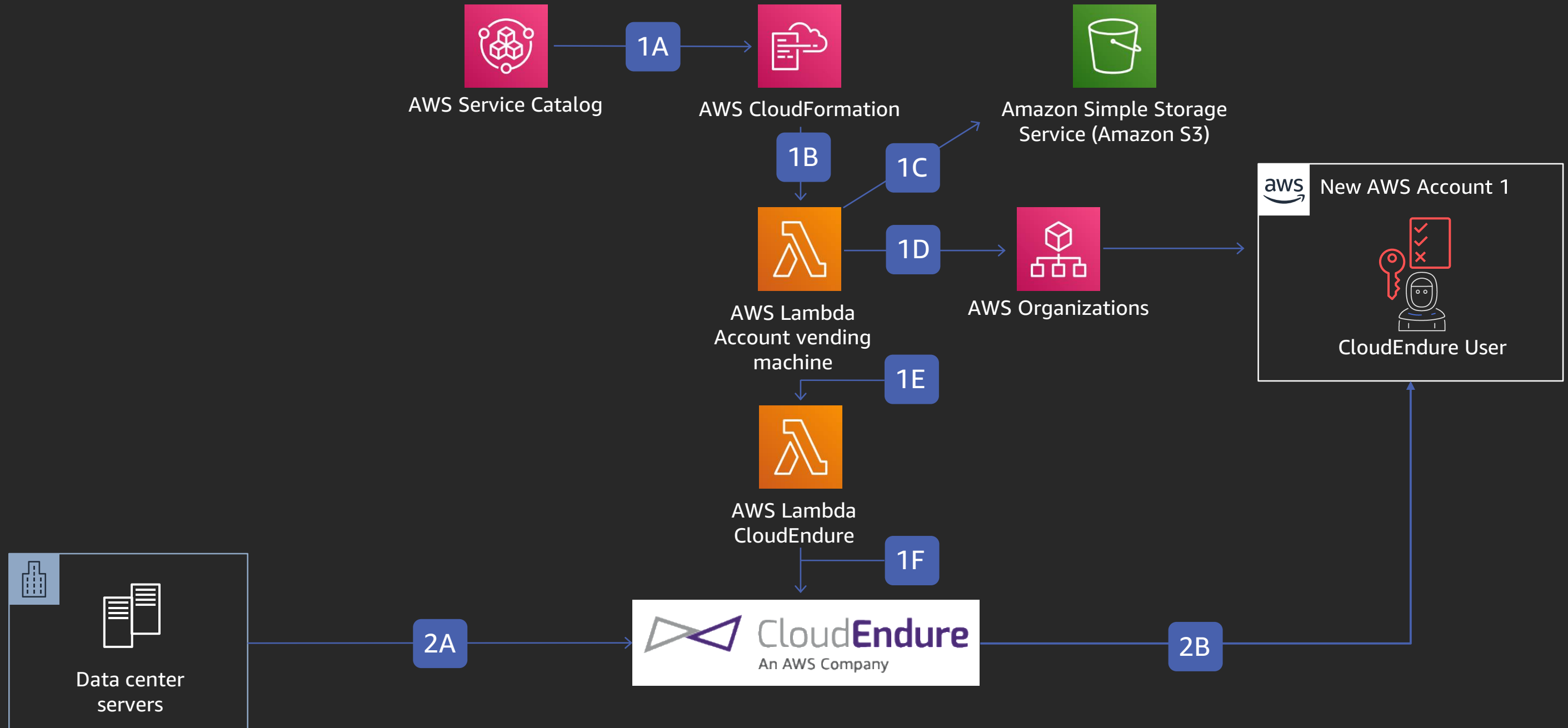
What about account structure?

Project-based or
line of business accounts



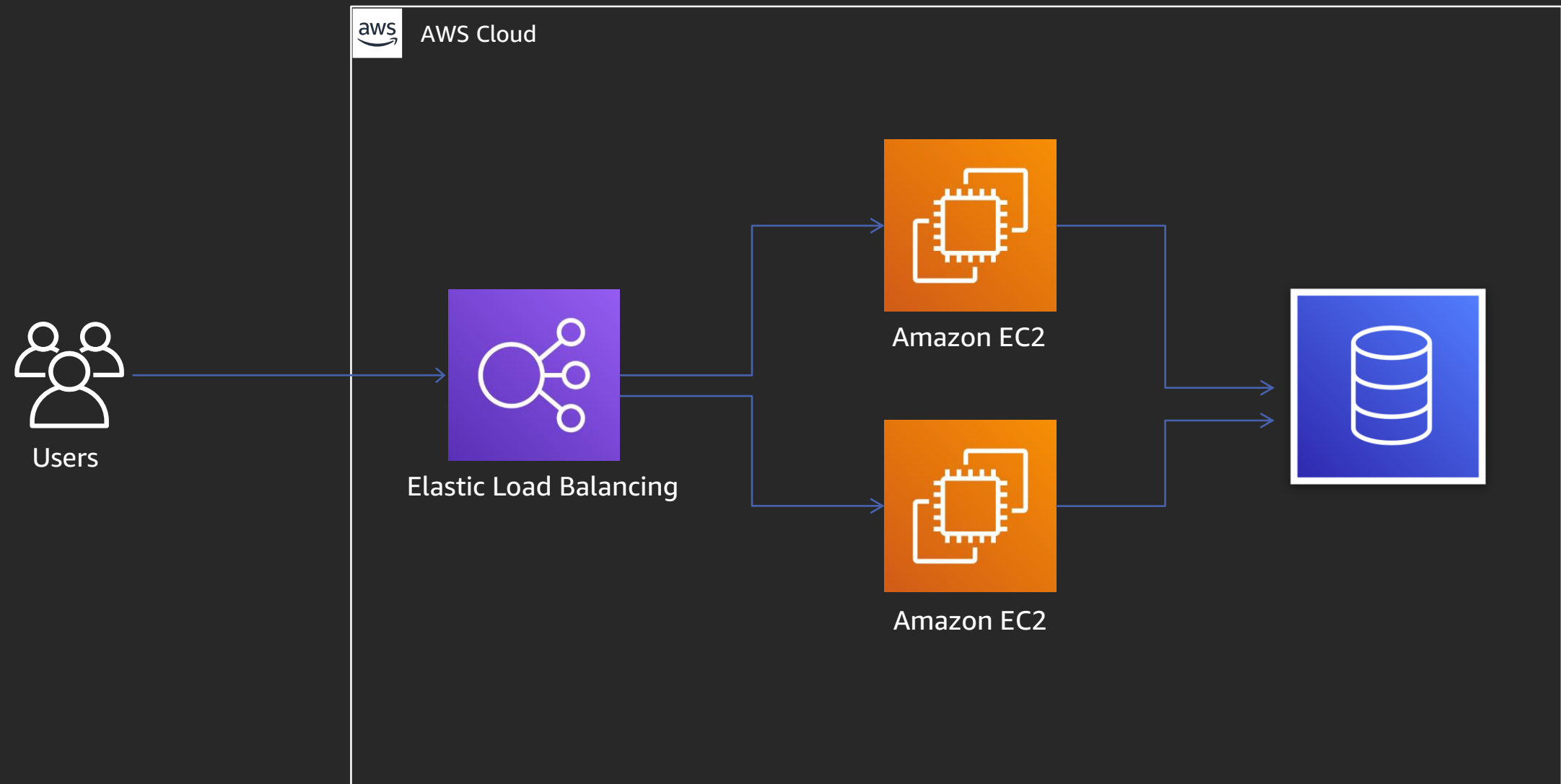
Think about automation

How would I use a migration tool in the context of a landing zone?

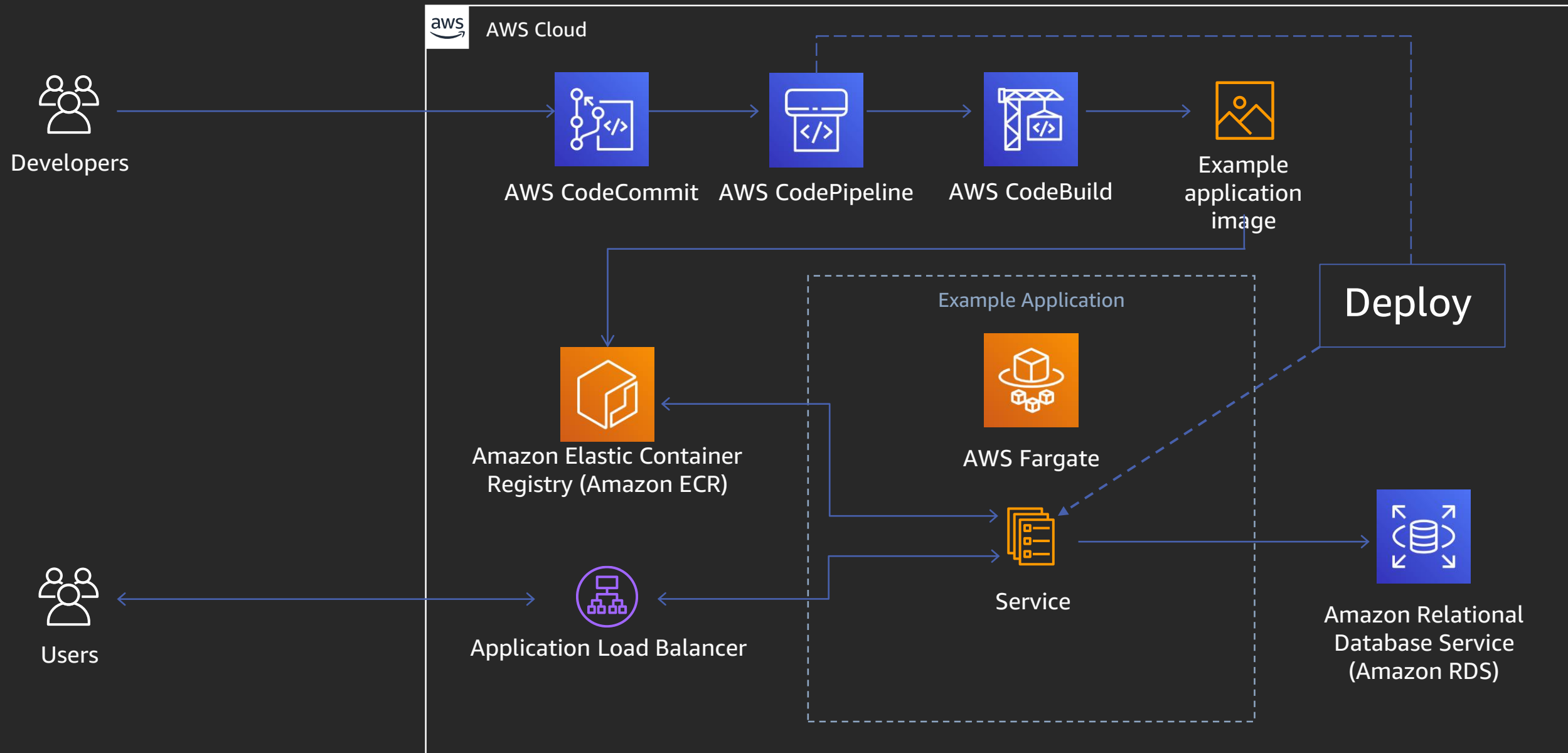


It's not just lift & shift

A simple example...



Why not containers? The AWS Fargate model



Considerations for migrating to containers

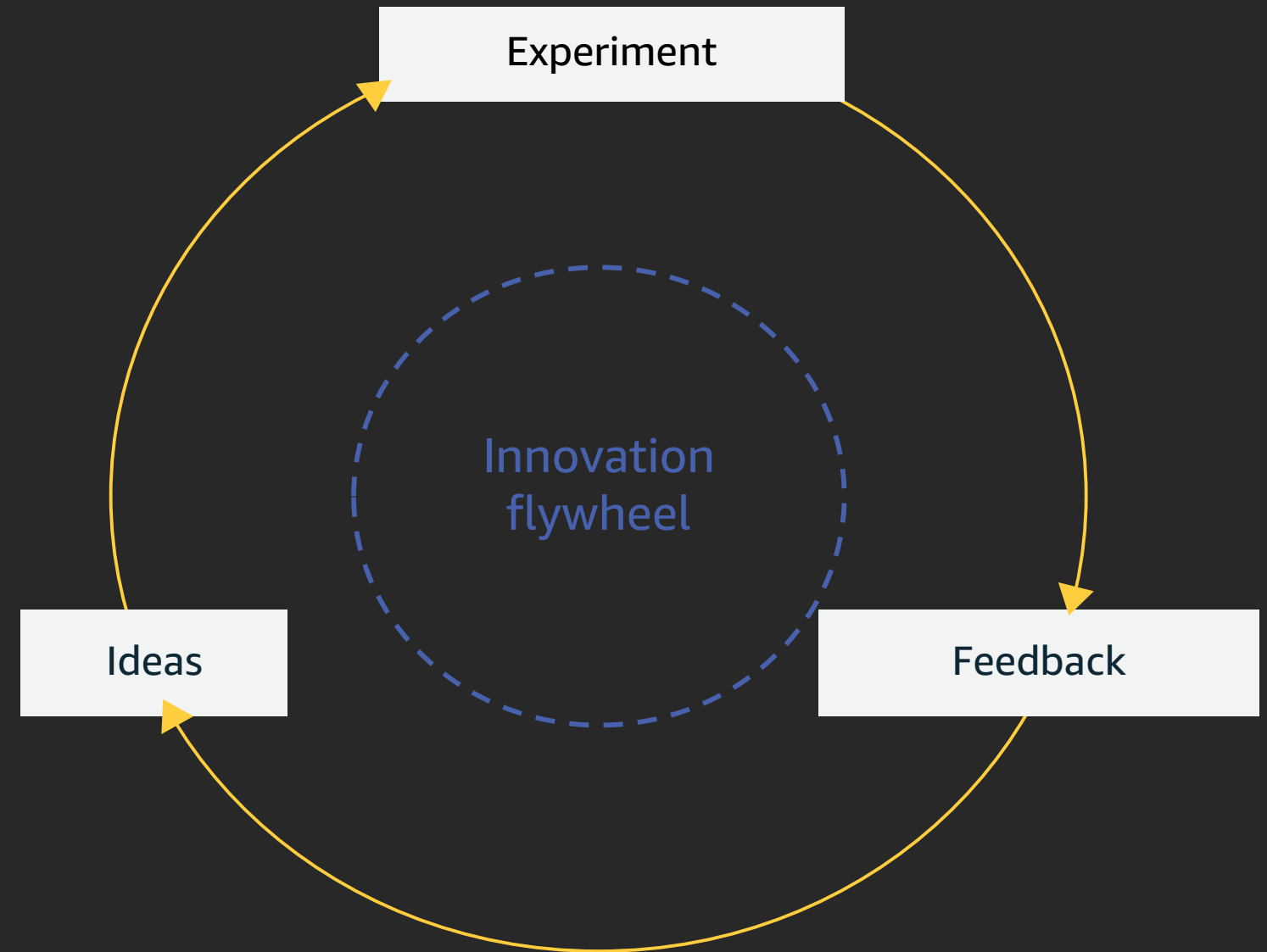
	Easy	Moderate	Difficult
Code	Completely isolated (single process)	Somewhat isolated (multiple processes)	Self-modifying (e.g., actor model)
Configuration	One file	Several files	Anywhere in file system
Data	Served in single space	Saved in several places	Anywhere in file system
Secrets	Static files	Network	Dynamic generation of certificates
Network	HTTP, HTTPs	TCP, UDP	IPSEC, highly isolated
Installation	Packages, source	Installer and understood configuration	Installers (install.sh)
Licensing	Open source	Proprietary	Restrictive and proprietary

Optimization leads to innovation

Operate and Optimize

Now the fun begins

- Ensure application performance
- Look to proactively monitor your application end-to-end
- Track metrics, collect and monitor log files
- The goal is to resolve issues before they impact your customers
- Fine tune your application – Always evolve
- It is an iterative process
- Think about scalability



NAB: National Australia Bank

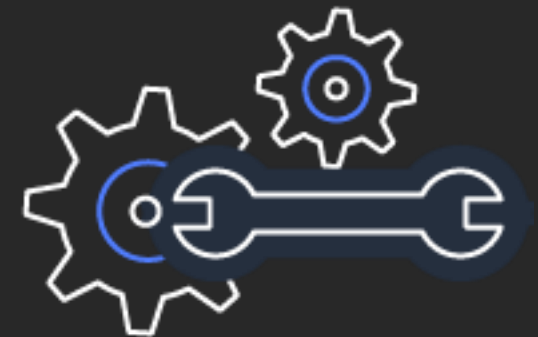


- 160 years old
- 30,000+ employees
- 9m customers
- Australia's largest business bank
- ~2,100 applications
- ~11,000 servers

NAB was facing a number of challenges

“How do I...”

- Reduce business risk by retiring technical debt at speed?
- Migrate workloads fast enough to meet our goals?
- Transform my customer experience and product development cycle?
- Avoid “*re-inventing the wheel*” for cloud operations?
- Prevent ops from being a brake on realizing cloud benefits?



Lesson 1: Be strategic



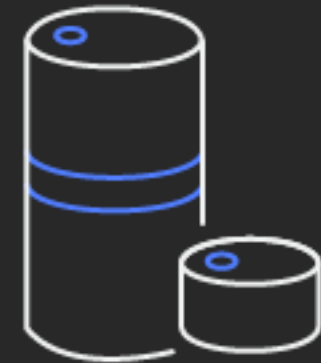
Cloud first strategy

Fully leveraging AWS innovation



Microservices and APIs

Smaller, reusable, cost-effective building blocks

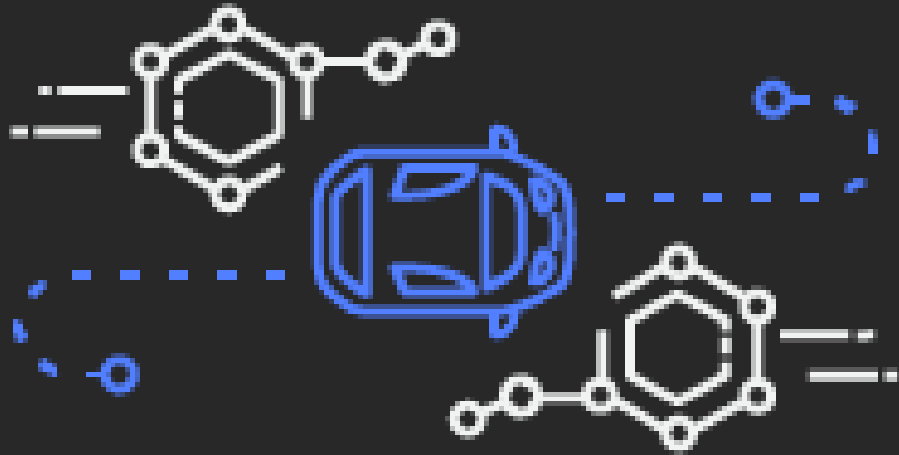


Data as a differentiator

Make it easier for our bankers and customers

Lesson 2: Think big

30 apps in 50 days

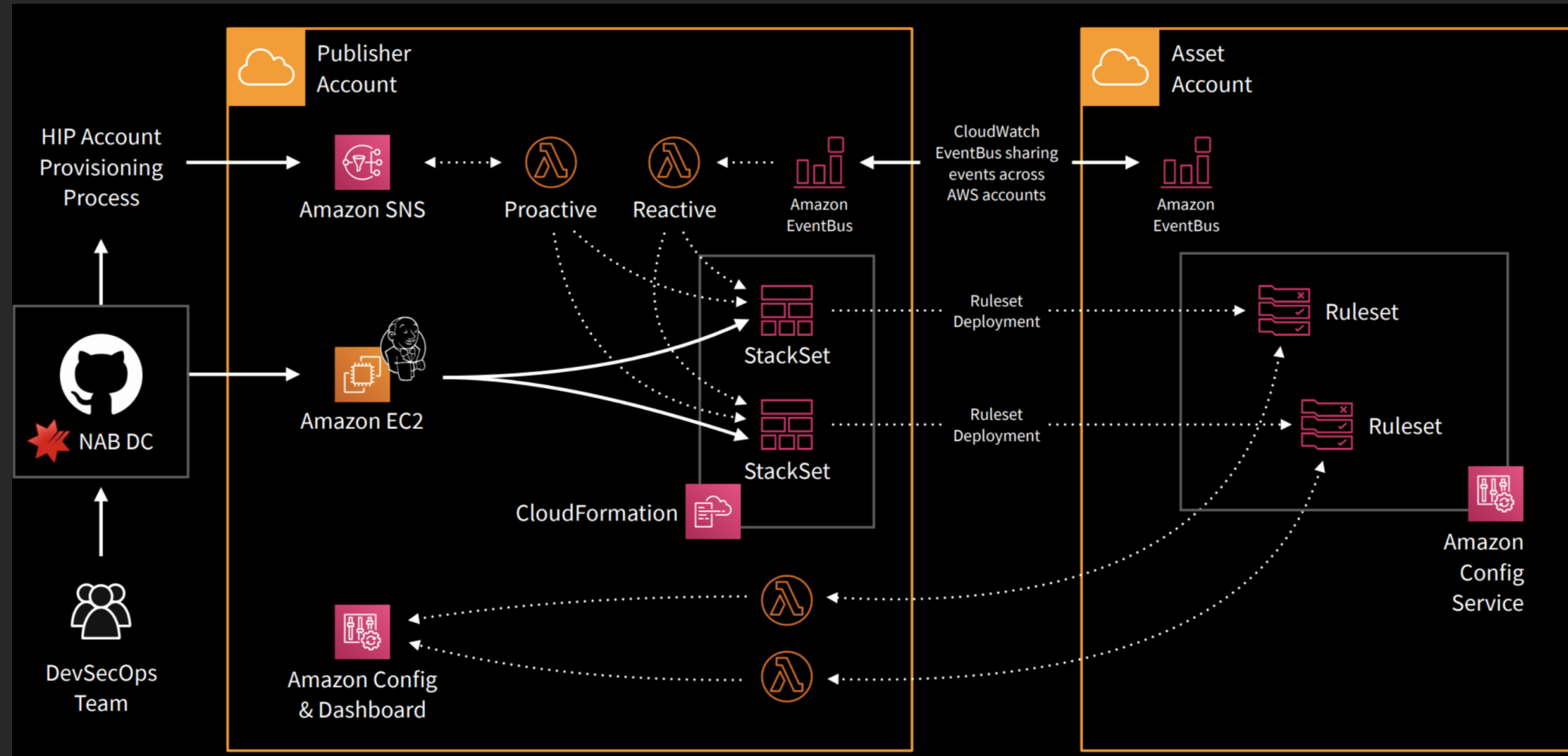


- Lower business criticality
- Nonmaterial workload
- Application active
- Hosted internally
- Registered in CMDB
- Application has an owner

Lesson learned: Understand your applications...Remember it is a two-way door

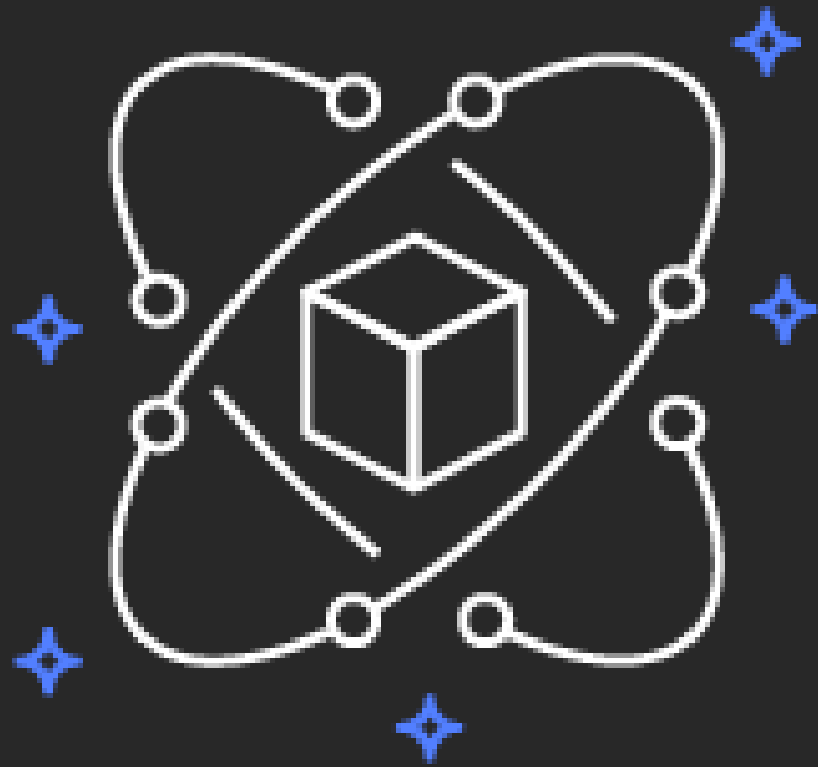
Lesson 3: Build the security in

- Build guardrails
- Understand dependencies
- Continuous compliance
- Deputy
- Integration is complex!



Lesson learned: This should have been started earlier

Lesson 4: Remove the bottlenecks



- Firewalls, firewalls, firewalls!
- Teams own the outcome
- Migration tools
- Data has gravity

Lesson learned: Implement application dependency mapping NOW

Lesson 5: Expand migrations

Provide guidance to teams on their migration approach

RE-HOST WHERE
THERE IS OS
CURRENCY

N/N-1

RE-HOST FOR
MASS MIGRATION
OUT OF THE
DATACENTER

RE-PLATFORM
FOR
PACKAGED
APPLICATIONS

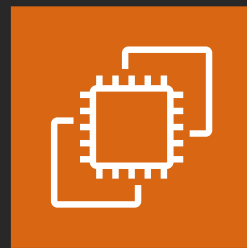
RE-ARCHITECT
TO FOCUS ON
CUSTOMER
VALUE

Lesson learned: Guide teams early

Lesson 5: Expand migrations

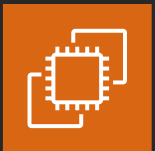
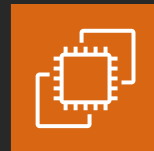
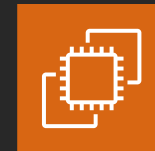


Repeatable infra
code



Servers, serverless and
containers

Spot fleet

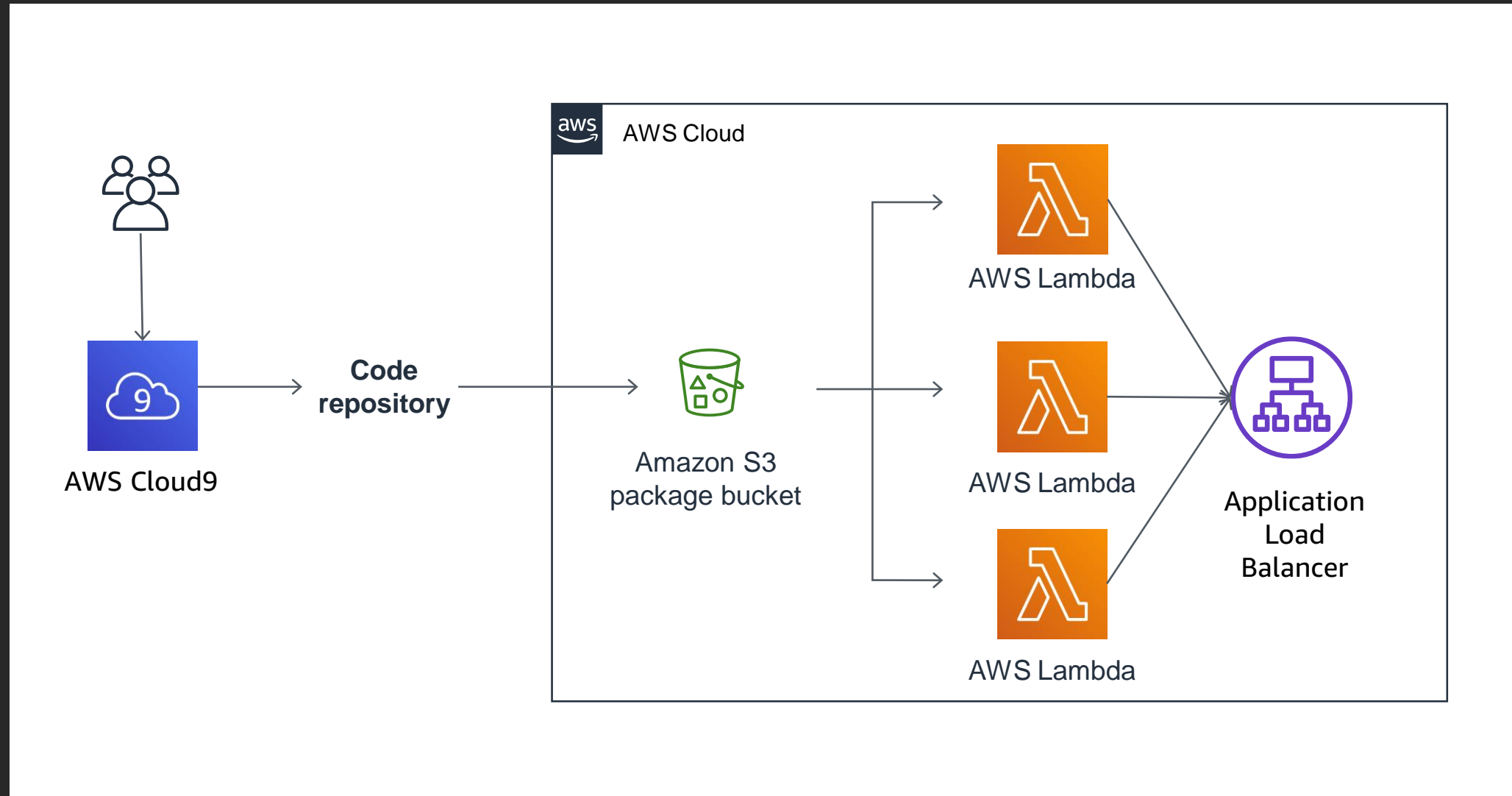


Engineering FinOps

Lesson learned: Be clear about your priorities... Set a BHAG

Lesson 6: Think outside the box

Lotus Notes to AWS Lambda



Lesson learned: Remember business benefit

Lesson 7: Automate delivery

The logo for the NAB Engineering Foundation (NEF) is displayed within a blue rectangular box. The letters 'NEF' are in a large, white, sans-serif font. Below them, the text 'NAB Engineering Foundation' is written in a smaller, white, sans-serif font, with 'NAB Engineering' on the top line and 'Foundation' on the bottom line.

NEF

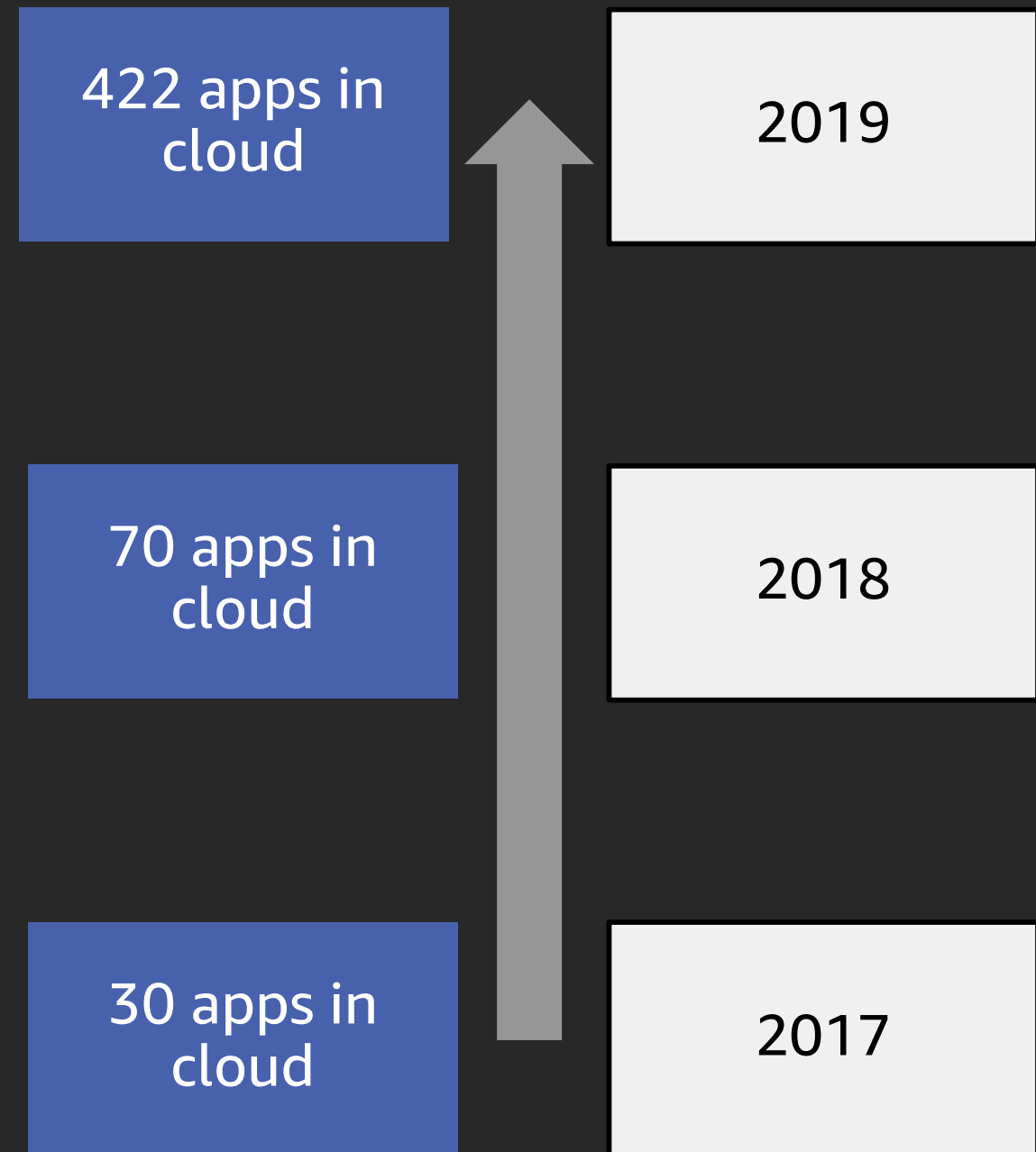
NAB Engineering
Foundation

- Developer experience
- Platform team
- Application templates
- Compliant CI/CD (JTE)
- Standardized approach

Lesson learned: Standardized can help with velocity

Migration summary

- Executive support
- Application analysis
- Think big
- Cloud education
- Targeted roles



Where are we now?



- Authorized AWS training partner
- 5,000+ AWS-trained in AWS
- Largest number of AWS-trained engineers in Australia/New Zealand
- 400+ applications in the cloud

Related breakouts

ENT218 - Executing a large-scale migration to AWS

ENT304 – Build a migration factory with CloudEndure and Migration Hub

ENT319 – Migration to AWS: A foundation for enterprise transformation

AWS Training and Certification for the enterprise

Resources to help your organization build cloud skills and achieve business objectives



Cost savings
(TCO)



Staff
productivity

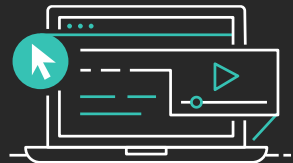


Operational
resilience

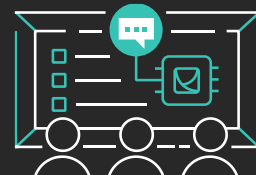


Business
agility

Comprehensive skill development plan for broad cloud fluency



Digital training



Classroom training



AWS Certification



Enterprise resources

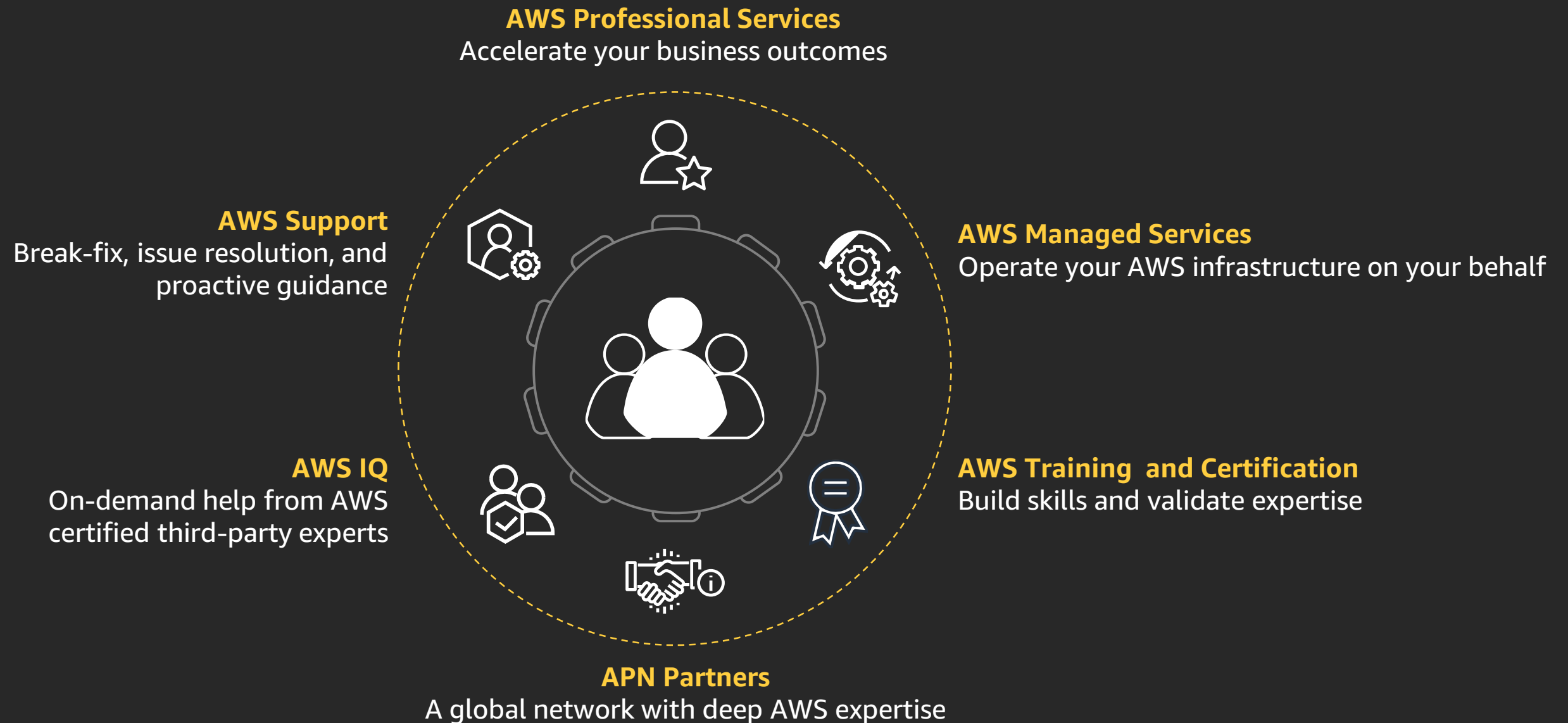


Talent pipeline

Visit aws.amazon.com/training/enterprise

AWS customer enablement

Migrate and build faster in the cloud



Thank you!

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Please complete the session
survey in the mobile app.