

The background features a dark navy blue field with abstract, overlapping shapes in vibrant magenta and deep red. Two thin, light blue lines intersect diagonally across the upper right portion of the image. The text is positioned on the left side.

# AWS re:Invent

DECEMBER 2 – 6, 2024 | LAS VEGAS, NV

M A M 2 1 4

# Gilead Sciences' AWS migration: From VMware to cloud transformation

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# Agenda

- 01 Overview of migration to AWS
- 02 Gilead's approach for VMware migration to AWS
- 03 Gilead's AWS migration journey
- 04 AWS migration best practices and getting started



# What does migration to AWS and digital transformation mean to you?

# Understand your compelling “why?”

## Changing business needs



Delivery speed improvement



Acquisition of another business



Divestiture of a line of business

## Enabling technology to support business growth



Moving to data-driven business



Scalability improvements



Move to compete globally

## Improve operational efficiency



Reduce technical debt



Licensing cost reduction



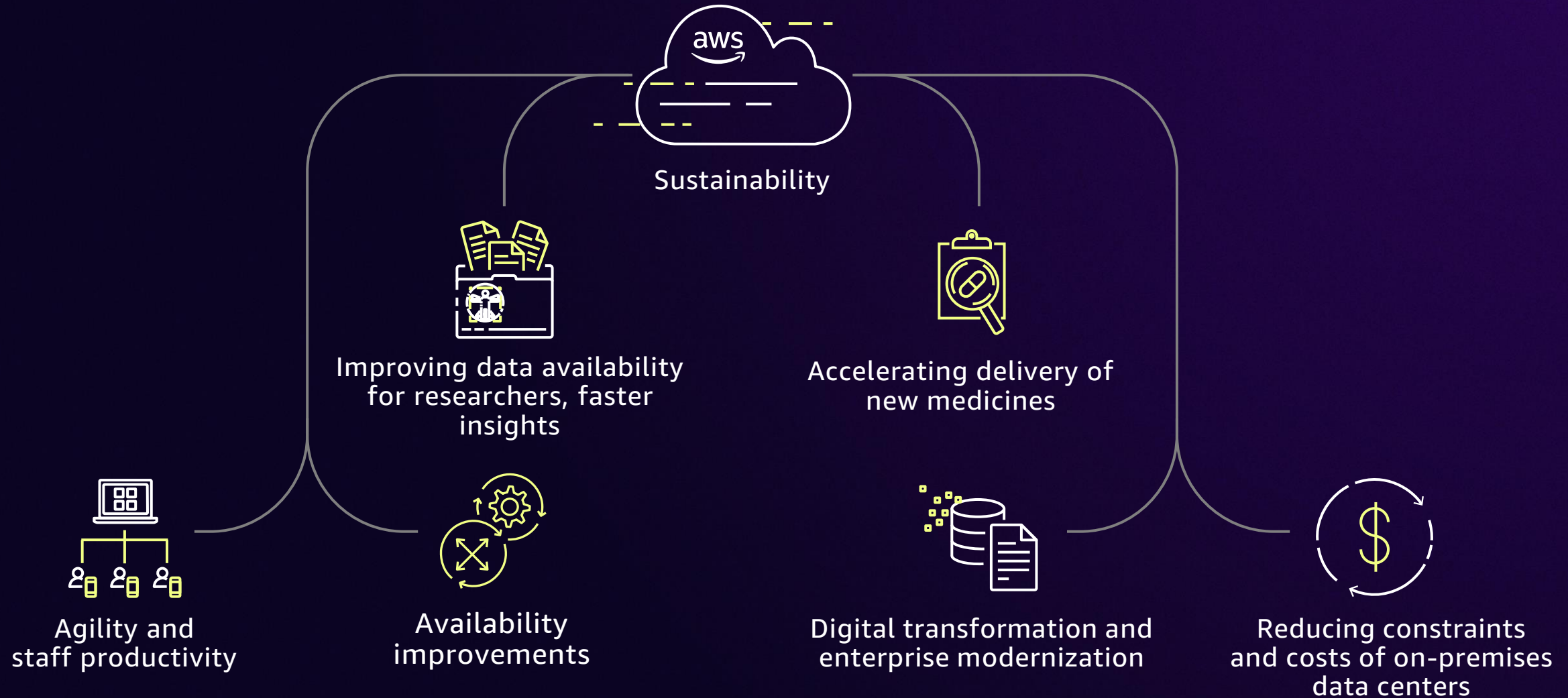
Time-driven data center exit



All of the above



# Gilead's business drivers for cloud migration



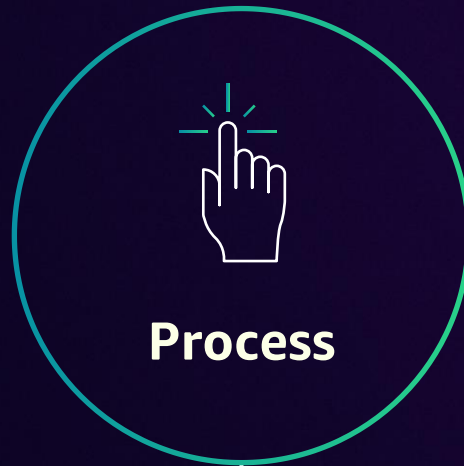
# Cloud adoption transforms people, process, and technology

WHILE DISRUPTIONS ARE DAUNTING, THEY PRESENT OPPORTUNITIES



## People

- Upskill for innovation
- Leverage partnerships



## Process

- Streamline for agility
- Foster data-driven decision-making



## Technology

- Build more resilient IT infrastructure
- Embrace modernization solutions

# Existing challenges customers face before cloud migration



**People and process**



**Siloed teams**



**Prioritization**



**Leadership changes**



**Developing cloud skills**



**Cloud operating model**



# Gilead's approach for VMware migration to AWS







# Gilead's mission

To discover, develop, and deliver  
innovative therapeutics for people  
with life-threatening diseases

# Growing our business for greater impact



## PIPELINE

Bring 10+ transformative therapies to patients by 2030

## PREFERRED PARTNER

Be the biotech employer and partner of choice

## SUSTAINABLE VALUE

Deliver shareholder value in a sustainable, responsible manner



# Drivers for migrating from VMware on-premises to AWS



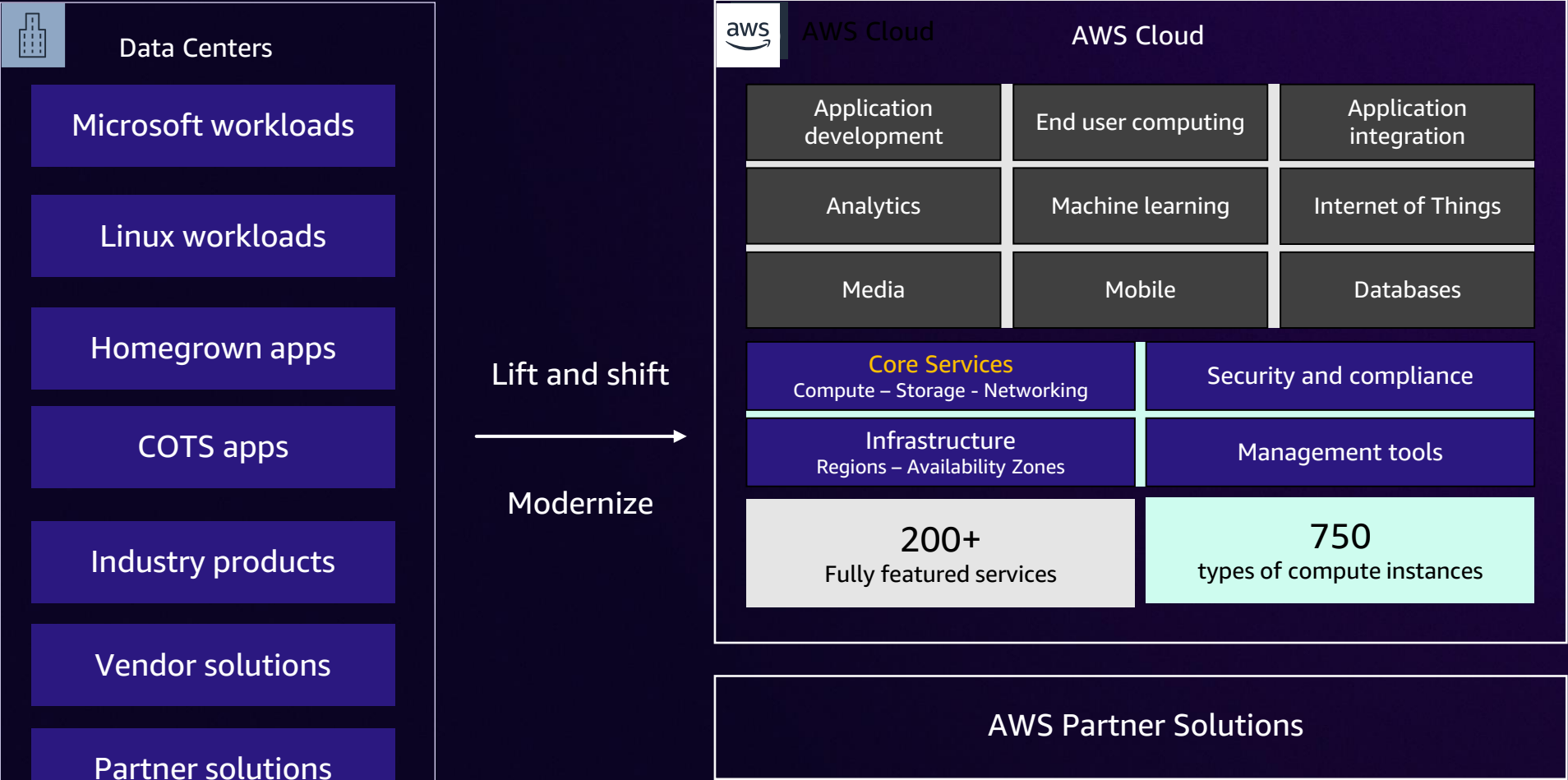
## BUSINESS DRIVERS

- Address increases in licensing costs, risks, disruption, complex contracts
- Innovate and modernize processes
- Become a more data-driven organization
- Consolidate systems
- Improve sustainability

## TECHNICAL DRIVERS

- Reduce technical debt
- Improve security, scalability, and reliability
- Consolidate and eliminate data centers
- Accelerate cloud adoption while retaining certain workloads on-premises
- Increase IT staff productivity and retention
- Accelerate application delivery

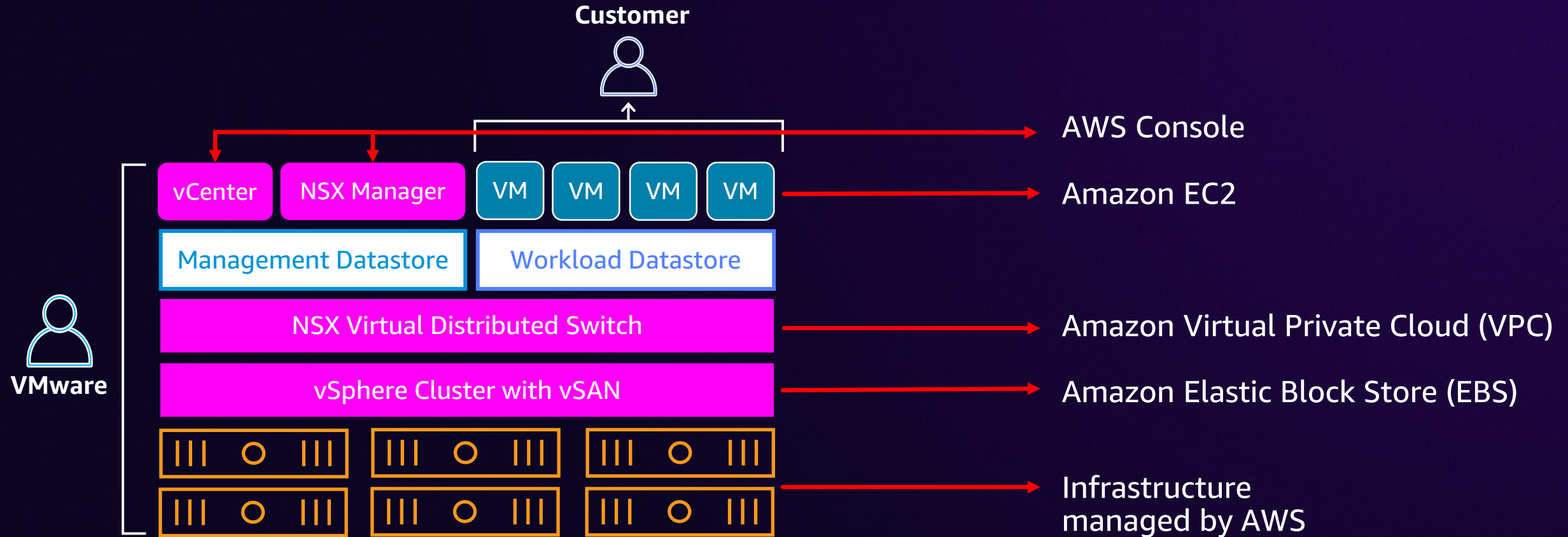
# Migration options



## Considerations

- Timelines
- Cost savings
- Agility
- Security
- Elasticity
- Cloud maturity
- DevSecOps maturity
- Regulatory
- Containerization
- DR and HA
- Software vendor licensing

# VMware to AWS technology mapping





# VMware migration checklist

## Assess

### Assessment

- ✓ Infrastructure discovery
- ✓ Total cost of ownership report or a business case
- ✓ Optimization of Licensing Assessment (OLA)
- ✓ Application discovery
- ✓ Application dependency mapping
- ✓ Initial migration strategy (R-Patterns)
- ✓ Illustrative migration planning (complexity scores and resource estimates)
- ☐ Migration readiness assessment (MRA)

## Mobilize

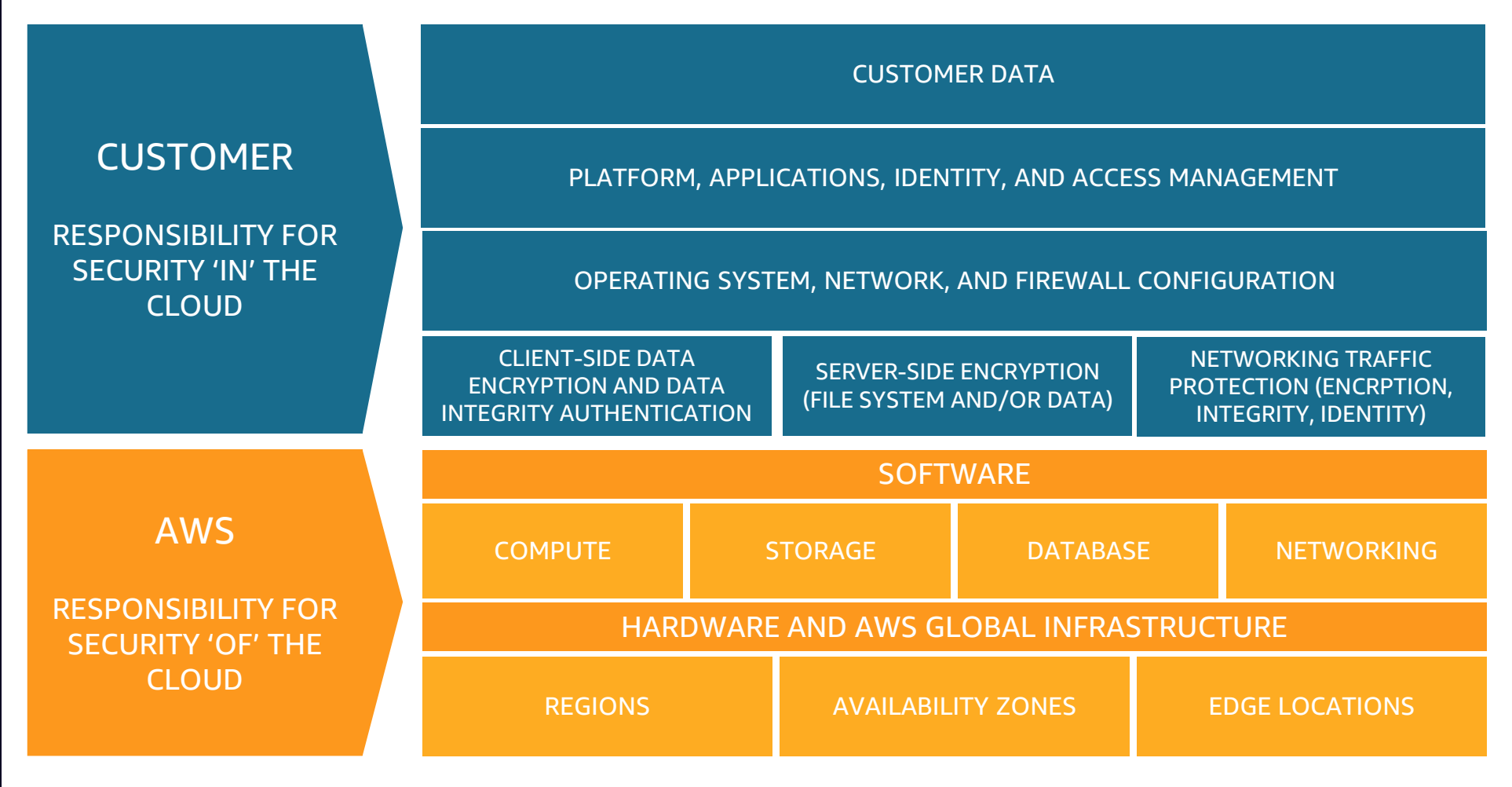
- ✓ Application discovery and dependency mapping
- ✓ Initial migration strategy (R-Patterns)
- ✓ Indicative migration plan (application complexity score, prescriptive initial migration recommendation)
- ✓ Data required for mobilize/migrate engagement
- ☐ Finalize migration strategy and AWS architecture
- ☐ Continuous wave planning
- ☐ Develop and launch landing zone
- ☐ Prepare cloud operating model/security profile
- ☐ Launch cloud center of excellence
- ☐ Install migration software
- ☐ Etc...

## Migrate & Modernize

- ☐ Replicate and cutover applications and servers

*Illustrative and not exhaustive*

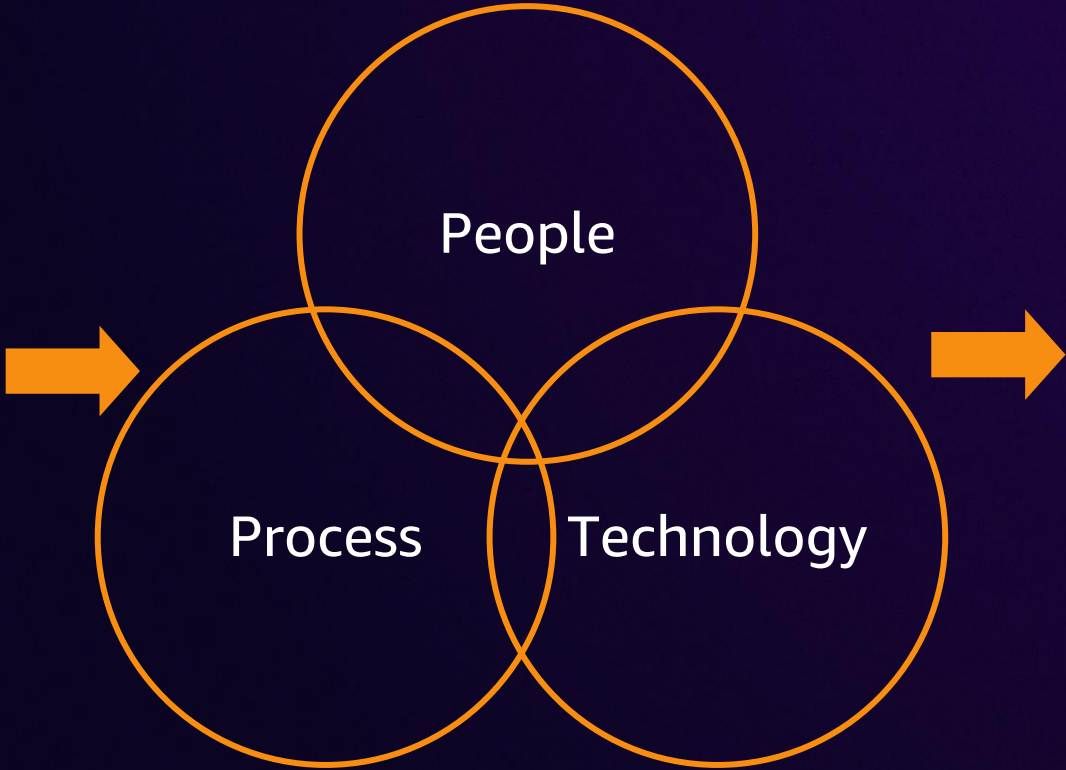
# Shared responsibility model – Security and compliance



# Security built into the foundation

## AWS CLOUD ADOPTION FRAMEWORK (AWS CAF)

Business capability focused	<b>Business</b> Value realization
	<b>People</b> Roles and readiness
	<b>Governance</b> Prioritization and control
Technical capability focused	<b>Security</b> Risk and compliance
	<b>Platform</b> Applications and infrastructure
	<b>Operations</b> Hybrid and dynamic



### Outcomes

- Defined requirements
- Access control
- Monitoring and detective capabilities
- Secure infrastructure
- Data protection
- Encryption
- Cloud incident response & investigative maturity
- Security automation
- Consistency & repeatability
- Governance
- Compliance & policies
- Risk management

\*not an exhaustive list

Reference: “The Security Perspective of the AWS Cloud Adoption Framework” Whitepaper [https://d0.awsstatic.com/whitepapers/AWS\\_CAF\\_Security\\_Perspective.pdf](https://d0.awsstatic.com/whitepapers/AWS_CAF_Security_Perspective.pdf)





# VMware migration outcomes

**2,200**

Servers migrated from  
VMware to AWS

**340**

Applications  
migrated to  
AWS

**1.2 PB**

Migrated shared file  
storage to FSxN

**1,400**

VMware servers  
decommissioned





# Future state of our VMware workloads

OUR MODERNIZATION JOURNEY

All cloud-native  
benefits and high ROI



## AWS Regions

	Modern Apps	Refactor
	Managed DB	Replatform
	Containers	Replatform
	Amazon EC2	Lift and shift/rehost

## AWS on-premises

	AWS Outposts
	Managed DB
	Containers
	Amazon EC2

Rapid adoption,  
foundation of cloud  
benefits and fast ROI

# Gilead's AWS migration journey

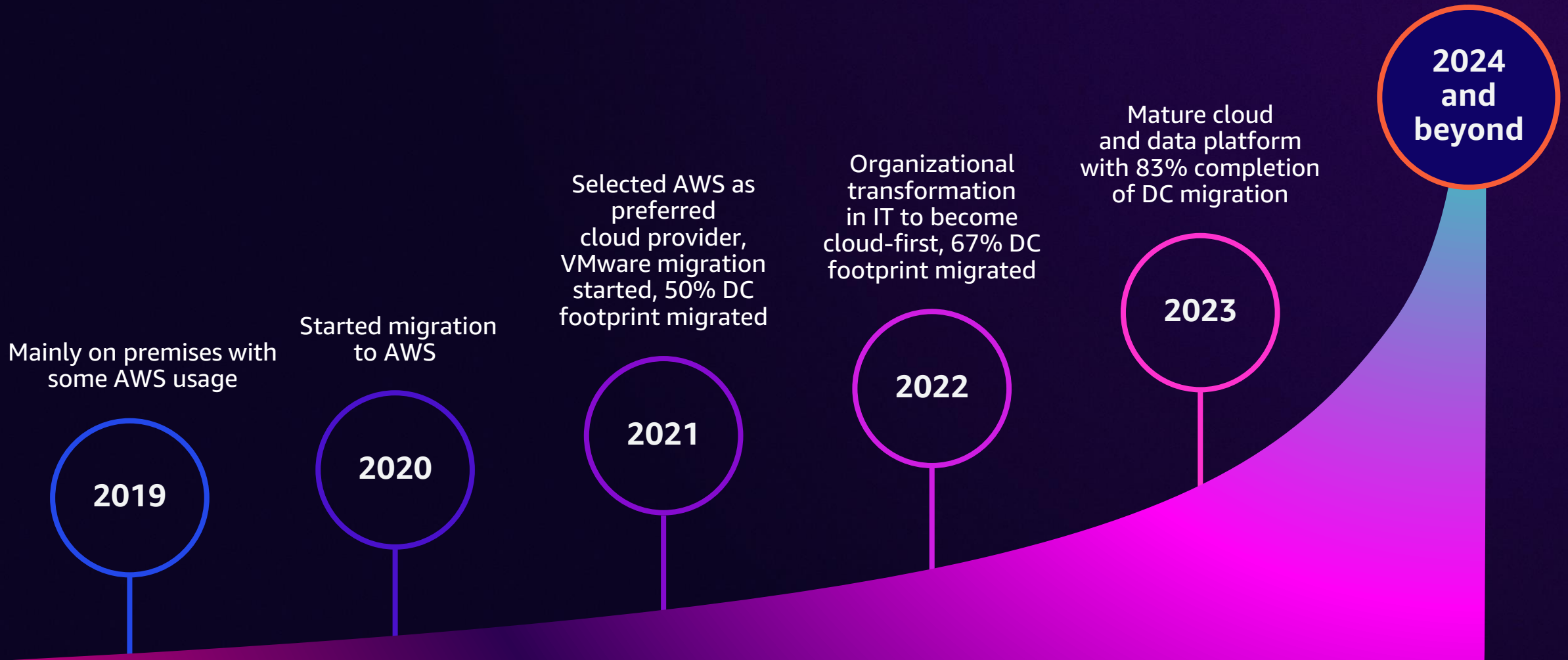


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# Gilead's migration journey with AWS

Migrated 87% of DC footprint including VMware, modernizing workloads using advanced AWS-native capabilities such as containers and serverless



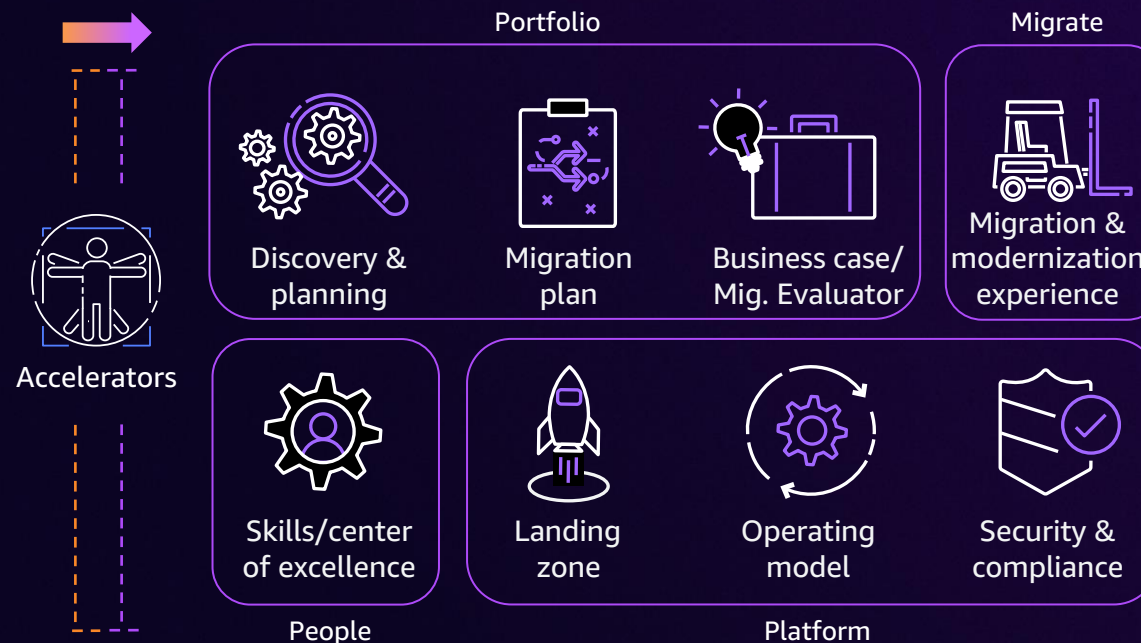
# Gilead's approach to AWS migration

## Assess



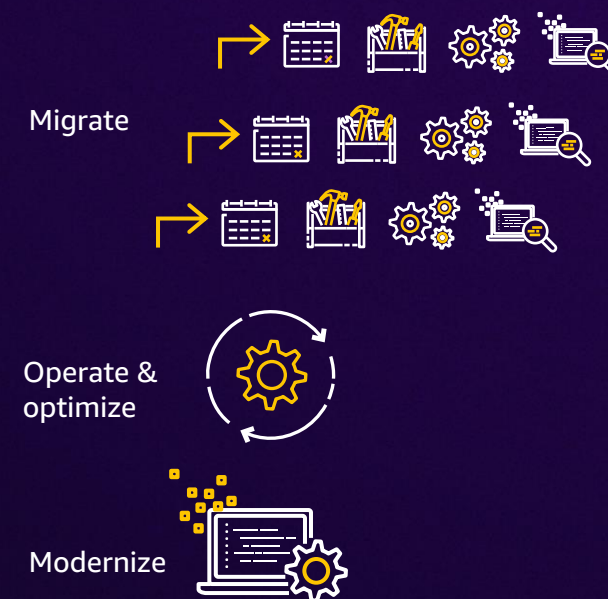
Create a case for change

## Mobilize



Build readiness through experiences

## Migrate & modernize



Accelerate transformation at scale

**AWS Professional Services**

# AWS Application Migration Service (MGN)

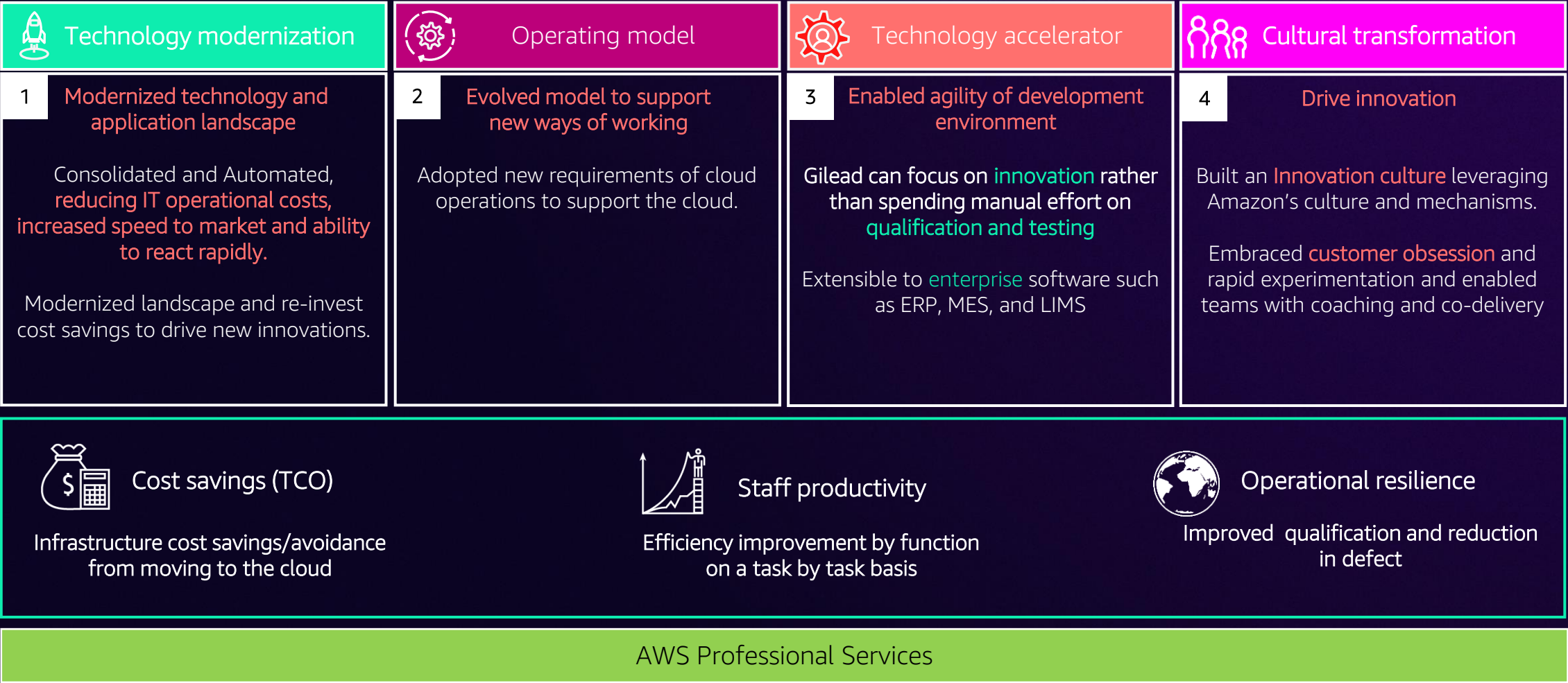
SIMPLIFY AND REDUCE THE COST OF MIGRATING YOUR APPLICATIONS TO AWS



Automate the conversion of your source servers to run natively on AWS with AWS MGN. Simplify application modernization with built-in and custom optimization options.

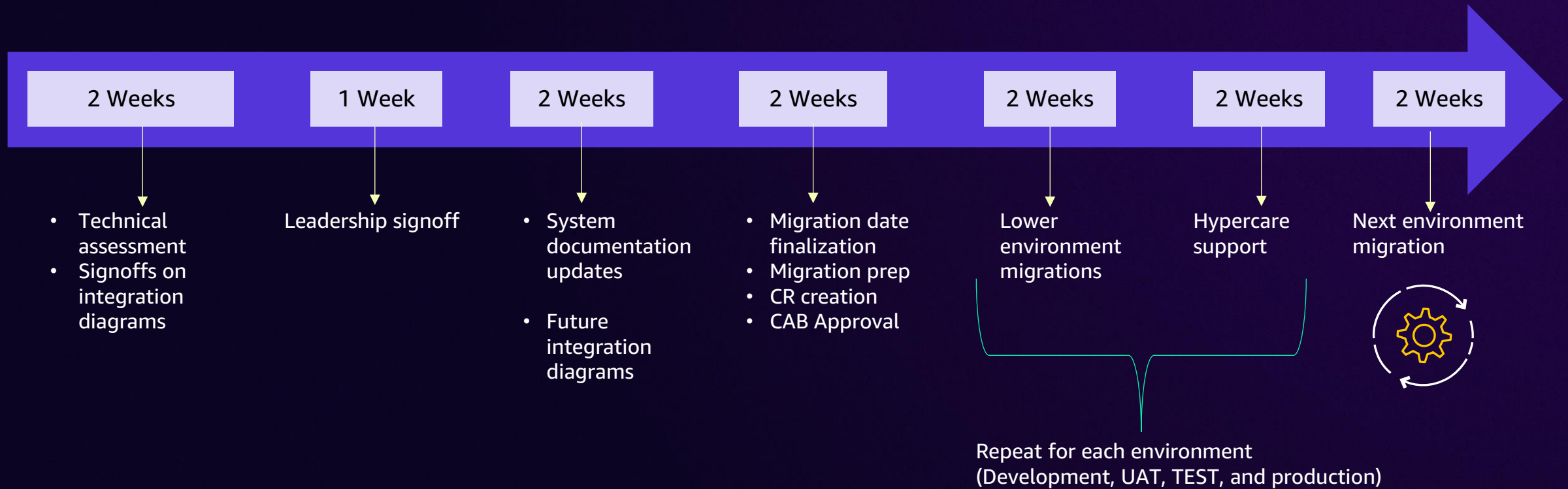
- Migrate applications to AWS with or without changes to applications or workflows
- AWS MGN automates migration of VMware-based VMs to AWS
- Modernize using AWS MGN preconfigured or custom actions during cutover
- Access the full range of AWS capabilities to modernize applications running on AWS

# Automated Continuous Compliance (ACC) for GXP workloads





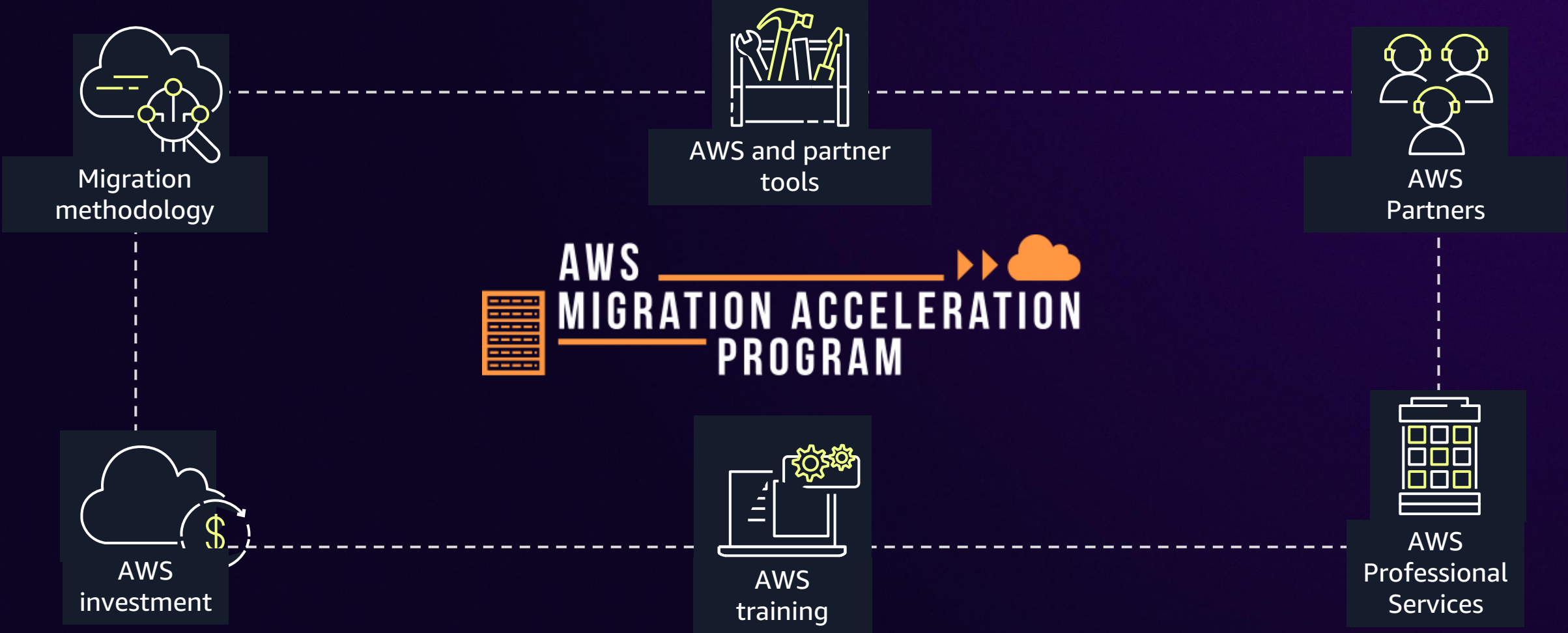
# High-level approach with timelines



- The development environment was migrated first
- After each environment migration, there was a two-week period for hyper care support and preparation for the next environment migration
- Upon completion of all lower environment migrations, the production environment was migrated

# Migration Acceleration Program (MAP)

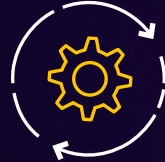
FLAGSHIP AWS PROGRAM TO HELP CUSTOMERS MIGRATE AND MODERNIZE TO AWS USING A PROVEN APPROACH



# AWS Migration: Process and methodologies



**Leadership  
support**



**Agile  
model**



**AWS  
training**

- ✓ Official communication sent from CIO office to application owners & end-user community to support cloud migration
- ✓ Kickoff meeting with the application owners was hosted by the head of cloud infrastructure
- ✓ Aligned with business leads & application owners on overall migration strategy and timelines
- ✓ Bidirectional conversations between migration team and application owners to finalize migration roadmap
- ✓ Coordinated IT and the applications changes via weekly forums and office hours
- ✓ Divided applications into migration waves as per the business need and technical feasibility
- ✓ Collaborated closely with application owners & third-party vendors for architectural decisions
- ✓ Conducted AWS Training program concurrently to upskill application teams

# Business value: Cloud value framework



**Cost  
savings**



**Staff  
productivity**



**Operational  
resilience**



**Business  
agility**



**Sustainability**

← Traditional  
TCO focus →

← Basis for holistic economic  
impact measurement →

← The climate  
pledge →

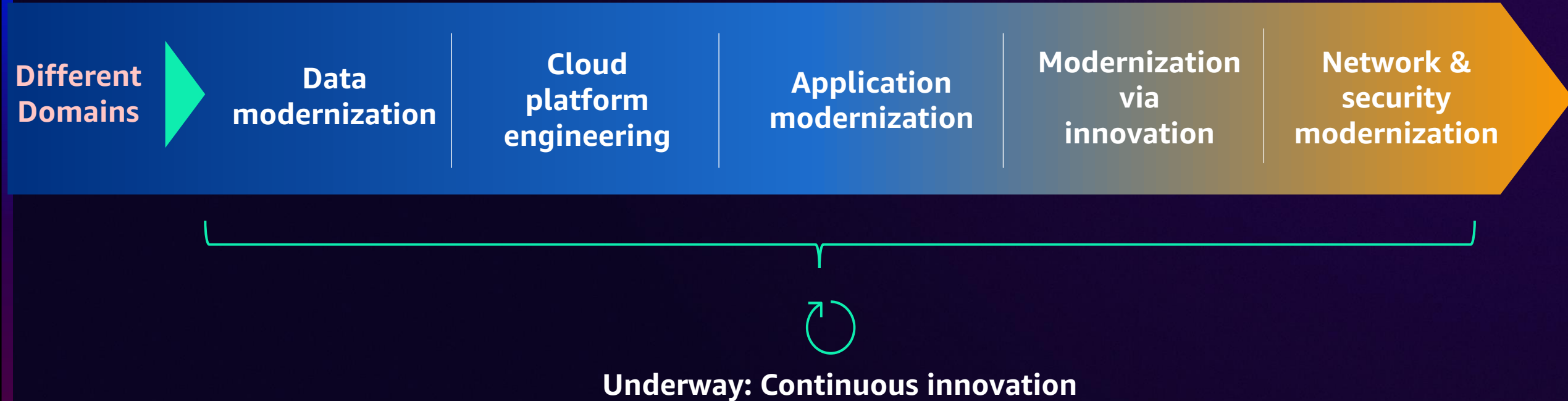


# AWS Migration: Lessons learned

- ✓ Reduced cost and increased application control and autonomy by creating dedicated accounts
- ✓ AWS Professional Services leading the overall migration program ensured continuous progress with experienced professionals
- ✓ Migration Acceleration Program (MAP) credits helped save on migration cost effective
- ✓ Define roadmap for decommissioning and potential hardware consolidation during the lift and shift process (compute and storage)
- ✓ Improved forecasting and hygiene on shared migration cost by creating a chargeback model to application teams
- ✓ Develop standard operating procedure for customized configuration settings in AWS, especially in re-platform scenarios
- ✓ Cloud fluency model, training, and upskilling the application community

# Modernization and innovation at Gilead

**Modernization** is a **culture** of relentless pursuit of **IT Transformation** for adding more value and advancing Gilead further towards our goal to discover, develop, and deliver innovative therapeutics





# AWS migration best practices and getting started





# Create a case for change

## Assess



Rapid discovery



TCO Report



Migration Readiness  
Assessment



Briefings &  
workshops



Immersion day

- Establishing data requirements and collecting data
- Evaluating potential third-party license cost savings
- Aligning on an understanding of the capabilities required
- Establishing a roadmap for the activities to come
- Agreeing to a prioritized list of actions
- Gaining organizational commitment to the journey ahead
- Develop a business case

## AWS tools and mechanisms:

- **AWS Optimization and License Assessment**
- **AWS Migration Evaluator**
- **AWS Migration Readiness Assessment**

# AWS Optimization and License Assessment (OLA)

- Assess your environment and get recommendations to optimize compute, storage, licensing
- Build a migration and licensing strategy to unlock cost savings as you transition to AWS



**36% average compute  
cost savings versus  
on premises<sup>1</sup>**



**33.83% faster  
migrations<sup>1</sup>**



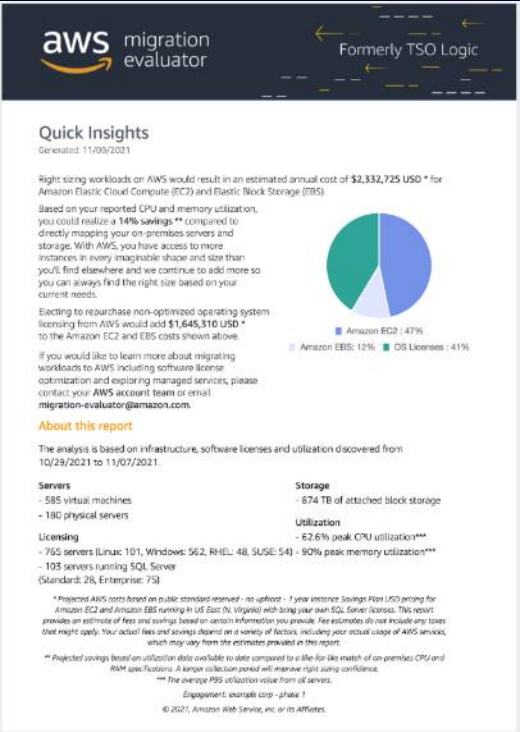
**58% more  
migrations<sup>1</sup>**

<sup>1</sup> AWS Finance, AWS benchmark data of customers who have run an optimization and licensing assessment compared to customers who have not

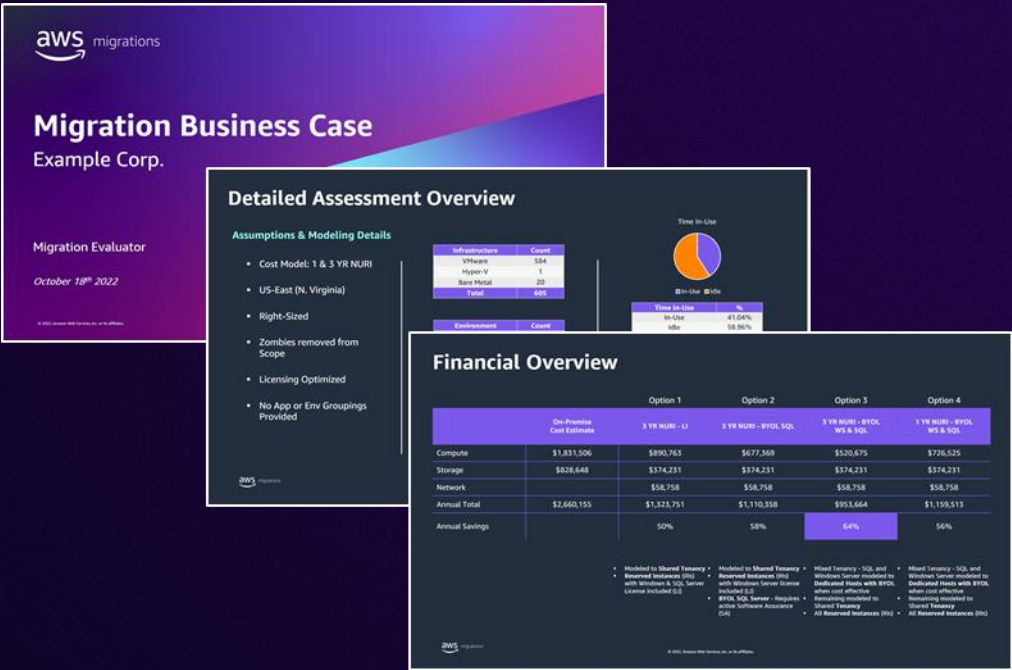
<sup>2</sup> Minimal customer requirements

# Business case with Migration Evaluator

## Quick Insights report



## Directional business case



Automated PDF and Excel  
export available within **48 hours**  
of data collection

Available **5 days** after data  
collection ends (upon request)





# The AWS Cloud Economics team can help

Remove financial blockers by building a comprehensive business cases that highlight the value of migrating to, and building on, AWS, and assists customers with managing, optimizing, and predicting their AWS cost and usage

[CUSTOMER] DIRECTIONAL BUSINESS CASE

Business Case Executive Summary

Background

Approach

Outcome

Next Steps

• Directional business cases which estimate value differences between capacity-driven on-premises environments and consumption-driven AWS environments have historically been difficult to complete due to differences in cost-drivers, fixed and variable and, among other factors.

• AWS Cloud Economics has developed an established methodology for evaluating migration value. [Stakeholder] at [Company] requested assistance with creating a directional business case to demonstrate the potential value created by migrating core services from on-premises to AWS.

• Leverage the AWS Cloud Value Framework to develop an applet to applet comparison of the total cost of ownership on-premises and AWS

• Data used in generating these estimates was sourced from [Migration Evaluator]

• The AWS and on-premises estimated spend is based industry averages and assumptions

• This business case includes right-sizing CPU/RAM utilization and time-in-use, based on industry standards

• The preliminary analysis indicates TCO savings of 34% over a period of 5 years. This does not include an EDP discount or MAP credits

Total Business Value Created

\$26,479,025

Cost Savings %

34%

Annual Savings

\$1,295,805

5-Year Savings

\$6,479,025

• Discuss assumptions with the customer to identify additional optimization areas

• Conduct a business case deep dive, as needed

• Refine business case with AWS Investments

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Note: The AWS costs is estimated as of the timing of the analysis; costs routinely change as AWS releases newer instances and services.

Executive summary

[CUSTOMER] DIRECTIONAL BUSINESS CASE

Business Value Savings Summary

Below is a 5-year summary of business value savings estimated based on data provided by the customer and industry benchmarks

Cost Savings (TCO)

Infrastructure cost savings / avoidance from moving to the cloud

IT Staff Productivity

Efficiency improvement by function on a task-by-task basis

Operational Resilience

Benefits of improving SLAs and reducing unplanned outages

Business Agility

Deploying new features applications faster and reducing errors

Description

\$X.XM

+

\$X.XM

+

\$X.XM

+

\$X.XM

Savings

Annual Savings Opportunity is \$XX.XM

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Financial impact results

[CUSTOMER] DIRECTIONAL BUSINESS CASE

Customer Carbon Reduction Benefit

KPI

% Improvement

Annual Benefit

Value Driver / Details

Estimated Carbon Reduction (Metric tons of Carbon)

89%

216.6

Total Carbon Reduction Estimate

72%

175.2

Benefit from Higher Server Utilization

17%

41.4

Benefit from Higher Renewable Energy Mix

1082.92 Metric tons of Carbon

5 Year Benefit

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Carbon reduction benefit results

[CUSTOMER] DIRECTIONAL BUSINESS CASE

5 Year Infrastructure Savings Summary

Cost Savings %

34%

Annual Savings

\$1,295,805

5-Year Savings

\$6,479,025

Compute

Storage

Network

AWS Support

Cost

Cost

Cost

Cost

Cost

Cost

Cost

Cost

• Compute and Storage data has been obtained from Migration Evaluator while Networking is representative for comparison

• This view reflects a steady state comparison of on-premises to AWS migration, it does not capture, Migration Costs or Migration ramp

• The cost represent ~40% of the estimated spend. Customers spend an additional 10 - 20% of the total on services (Monitoring, Advanced security, Marketplace etc.) in both on-premises and AWS environment

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Infrastructure savings summary

[CUSTOMER] DIRECTIONAL BUSINESS CASE

5 Year Steady State Cash Flow Summary

On-Premises

AWS

Year 1

Year 2

Year 3

Year 4

Year 5

Total

Compute

Storage

Network

AWS Support

Cost

Cost

Cost

Cost

Cost

Cost

Cost

Cost

• Compute and Storage data has been obtained from Migration Evaluator while Networking is representative for comparison

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Cashflow summary

[CUSTOMER] DIRECTIONAL BUSINESS CASE

Scope and Assumptions for TCO

Item

Scope

Scope

AWS Region

Business case and Hardware refresh timeline

Pricing Instruments

Co-location estimated cost

Compute Utilization

Physical hosts

Licensing

Storage

Networking

Support

• Analysis based on customer provided VM list from April 4, 2022

• Compute and Storage are obtained from the VM inventory. Network estimates are based on customer provided system requirements documentation

• Primary - US West (Oregon)

• DR - Asia Pacific (Tokyo)

• 5 years business case with 5 years refresh timelines

• 3 year refresh savings plan with all upfront pricing

• Spot instances for non-CRITICAL servers

• 20% MAP discount on Year 1 server and storage spend

• 8% EDP discount on server and storage spend

• Estimated rates based on Industry + OEM + Analyst Data applied to Renewal Inventory data

• Obtained from 2021 Migration Evaluator team

• Average CPU utilization was 32%. Average RAM utilization was 32%

• Host type was assumed based on the Hs4000 ES5000 model

• Detailed in customer provided system requirements with the following specifications:

• Hitachi Linux Windows, and RHEL licenses

• Customer owns S3, IAM, IAM

• On premises data disk storage mapped to EBS volumes, system disk storage part of EC2 mapping

• Daily and monthly backups for data and system disks respectively for the primary environment

• Includes VMs based for correction and monthly data regime

• Data obtained from customer provided system requirements documents

• Business level support had been estimated

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All assumptions used

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Examples are not exclusive, all business cases contain custom content

# AWS Professional Services rapid migration for VMware

END-TO-END SOLUTION TO AUTOMATE, DE-RISK, AND ACCELERATE YOUR MIGRATION

Assess

Mobilize and migrate



**Detailed AWS-led  
assessment**

Informs the  
migration scope,  
timeline, and cost



**Prescriptive  
framework and  
tools**

De-risk the  
migration with  
comprehensive  
delivery kit  
artifacts



**Fully automated  
AWS foundation**

Start migrations  
weeks sooner with  
a pre-designed  
landing zone



**Plan and  
automate  
migration tasks**

Maximize  
migration velocity  
with hyper-  
automation



**Cloud ops and  
specialist support**

De-risk with  
enhanced  
operating  
capabilities

**AWS Funded**



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# AWS migration incentives and support

MIGRATE WITH SPECIALIZED PROGRAMS, PEOPLE & TECHNOLOGY

For on-premises  
VMware customers



## TRAINING AND SUPPORT

- AWS-funded support with 460+ migration competency partners
- Upskill with migration and cloud skills courses
- Hands-on for rapid VMware migration from AWS Professional Services
- Guided VMware to AWS Immersion Days

## TECHNOLOGY

- Expedite lift and shift AWS Application Migration Service
- End-to-end planning with AWS Migration Hub Journey
- Automate processes with AWS Professional Services

## FUNDING AND INCENTIVES

- Increased AWS Migration Acceleration Program (MAP) Partner Funding to support VMware to AWS migration
- Lead with no-cost assessment



# Getting started



## Create a case for change

Assess your VMware estate by request an AWS assessment for cost savings on licensing, business case and migration planning



## Leverage AWS Professional Services or Partners

Engage with AWS migration experts or large network of AWS VMware and migration competency partners



## Decide on approach and strategy

Determine on your migration approach and timelines



## Begin migration by utilizing incentive programs

Take advantage of our incentive programs designed specifically for VMware migrations



Please complete the session survey in the mobile app

# Thank you!



Please complete the session survey in the mobile app