MI-01

Migrate and modernize your Windows workloads

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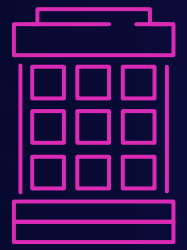
AWS

Agenda

- Our journey with Windows workloads
- Engineering innovations to power Windows workloads on AWS
    - Core infrastructure capabilities
    - Deployment & launch experience
    - Ease of managing licenses
- Modernizing Windows workloads
- Demo

Organizations are moving legacy applications and data to the cloud

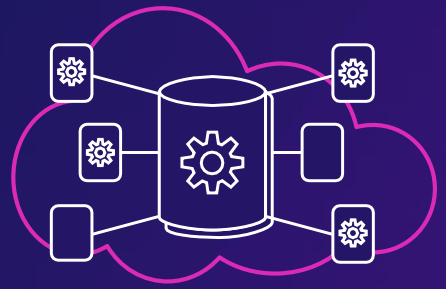
Windows
SAP
VMware
Databases
Mainframe



Legacy

GOALS

- Accelerate business transformation
- Increase agility and innovate quickly
- Reduce operating costs
- Access cloud scale, performance, and operations
- Improve security and compliance



Modern

>50% of enterprise workloads and data are expected to be in a public cloud within 12 months

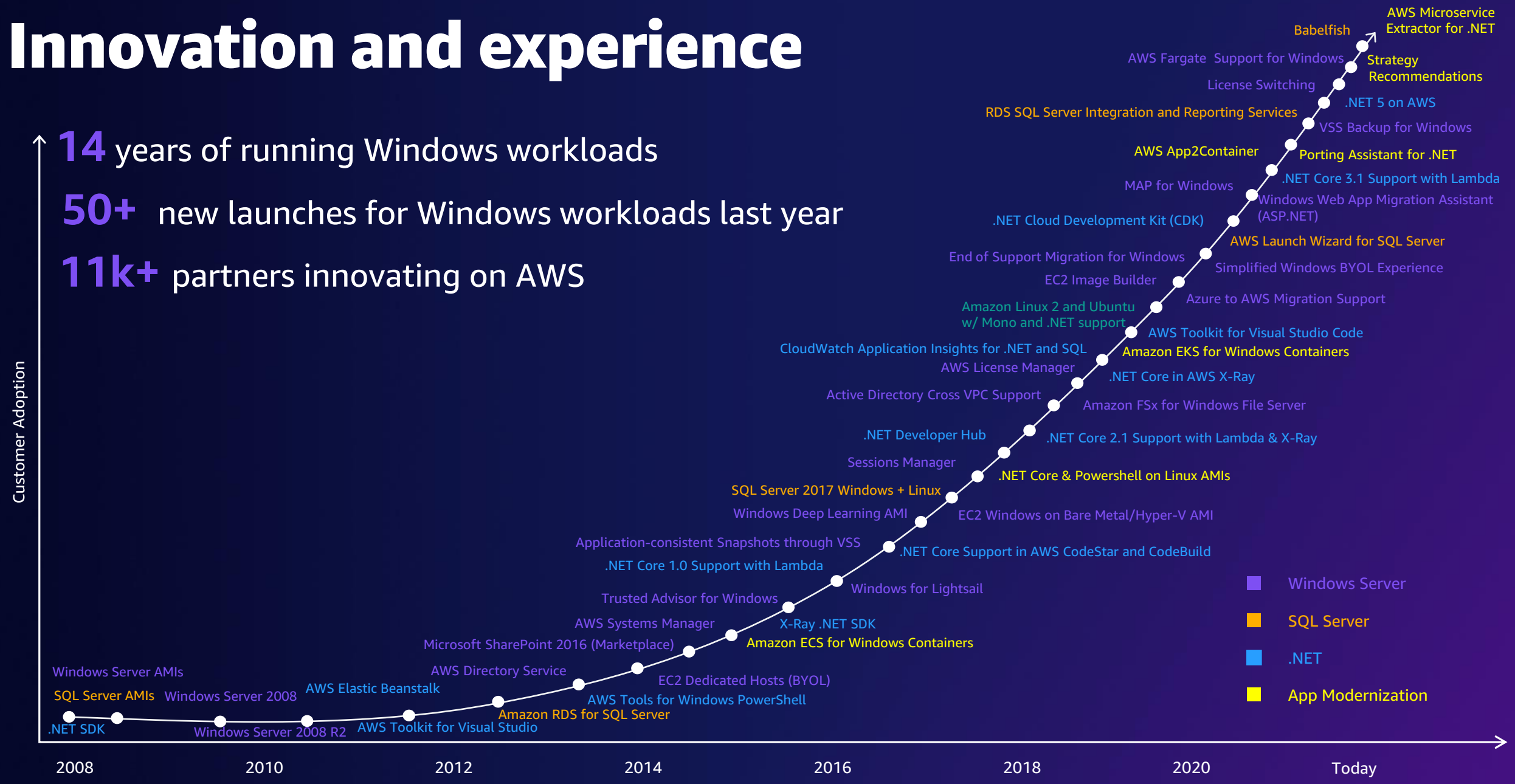
SOURCE: Flexera 2021 State of the Cloud Report

Innovation and experience

14 years of running Windows workloads

50+ new launches for Windows workloads last year

11k+ partners innovating on AWS



Innovation and experience

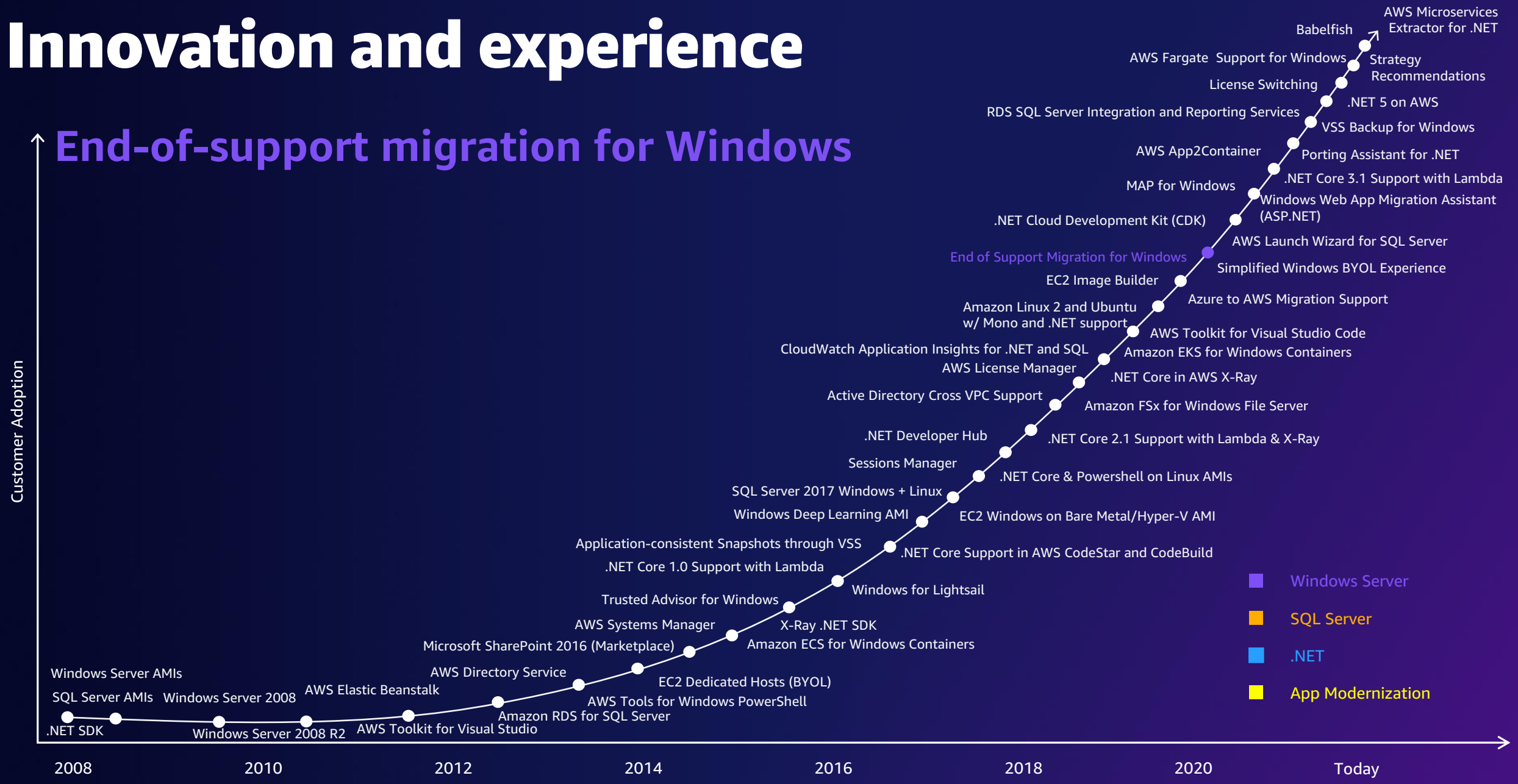
AWS Systems Manager

Innovation and experience

AWS License Manager

Innovation and experience

End-of-support migration for Windows



Innovation and experience

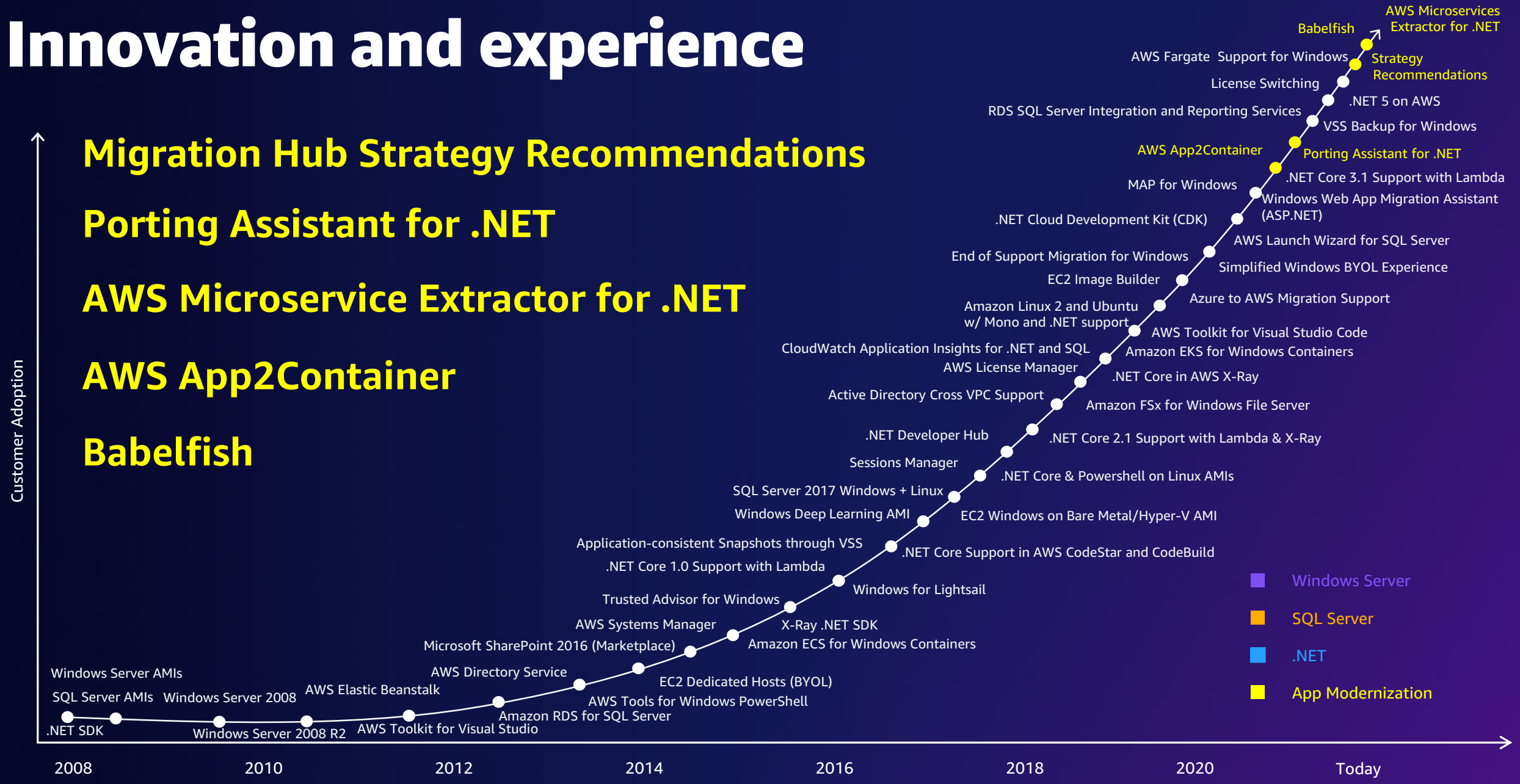
Migration Hub Strategy Recommendations

Porting Assistant for .NET

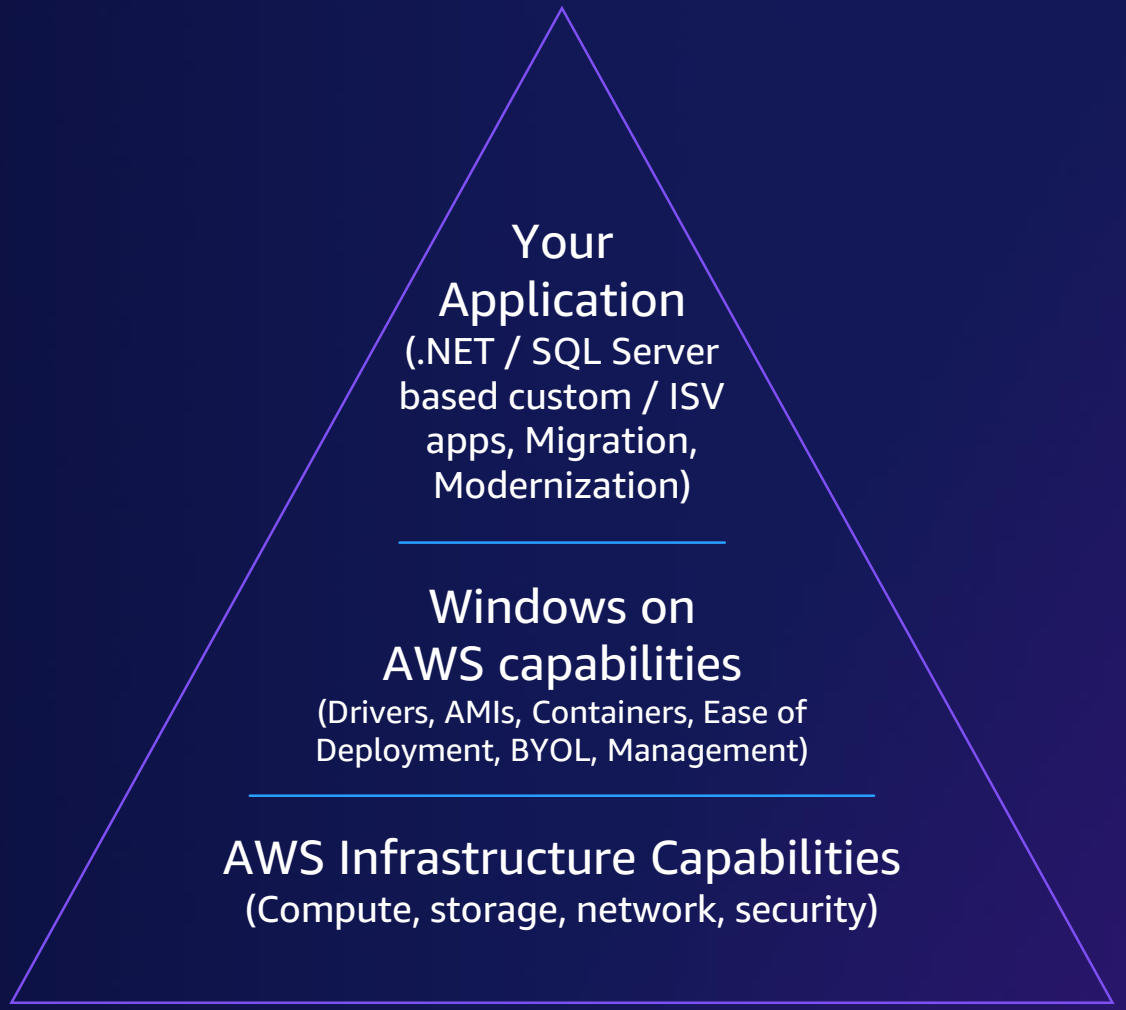
AWS Microservice Extractor for .NET

AWS App2Container

Babelfish



Building blocks



Infrastructure capabilities

Broadest and deepest platform choice

Categories

General purpose

Burstable

Compute intensive

Memory intensive

Storage
(high i/o, dense)

GPU compute

Graphics intensive

Capabilities

Choice of processor
(AWS, Intel, AMD)

Fast processors
(up to 4.5 GHz)

High memory footprint
(up to 24 TiB)

Instance storage
(HDD and SSD)

Accelerated computing
(GPU, FPGA, and ASIC)

Networking
(up to 400 Gbps)

Bare metal

Size
(Nano to 32xlarge)

Options

Windows, Linux, Unix, macOS

Amazon EBS

Amazon Elastic Inference

Elastic Fabric Adapter

475

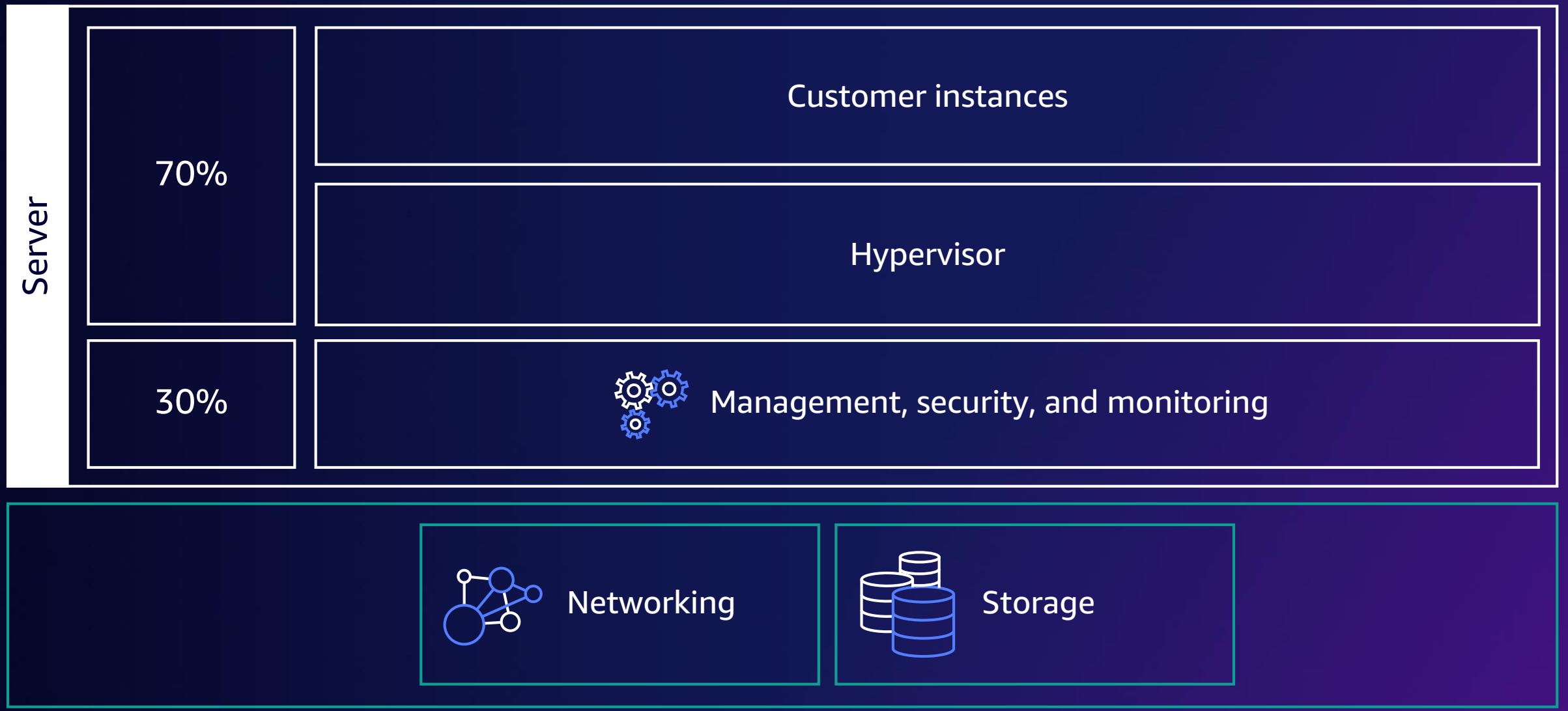
INSTANCE TYPES

for virtually every workload and business need

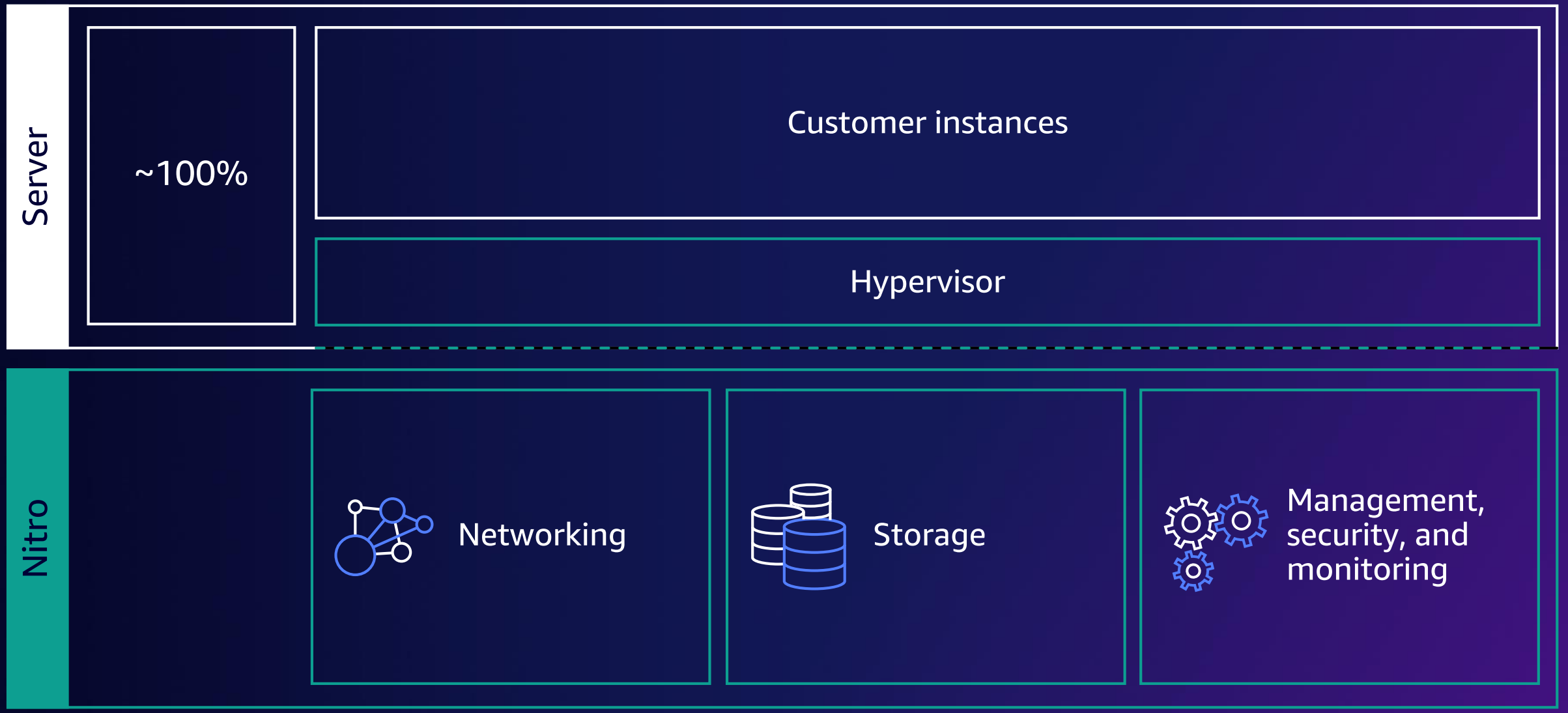
NITRO SYSTEM

Reimagined virtualization infrastructure

Pre-Nitro EC2 instance host architecture



The AWS Nitro architecture

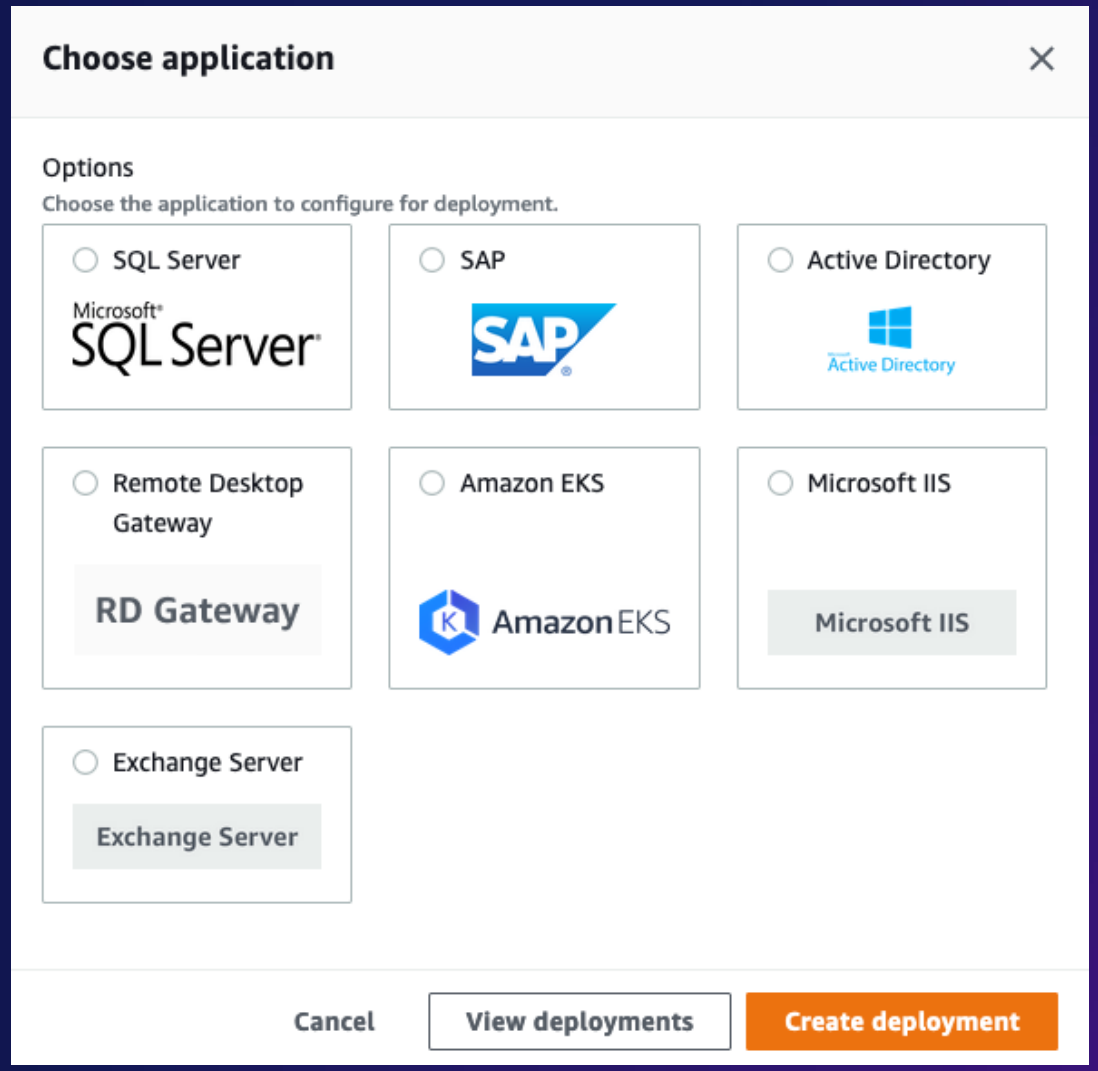


Deployment and launch experience

AWS Launch Wizard

EASILY SIZE, CONFIGURE, AND DEPLOY THIRD-PARTY APPLICATIONS ON AWS

- Simplify application deployment
- Automate AWS resource selection and cost estimation
- Save time with repeatable code templates
- Leverage proven deployment best practices from AWS



AWS Launch Wizard for SQL Server

Deployment

- Single node deployment
- Always on AG deployment
- FCI with FSx deployment
- Reusable code templates
- Dedicated Hosts support
- LI and BYOL support
- Windows Server support
- Linux support

Configuration

- Early input validation
- Connecting to existing on-premises and managed AD
- Auto-created SSM resource group
- One-click SNS notification
- One-click CloudWatch monitoring
- Managed IAM policy

Sizing and cost estimation

- Instance type recommendation
- Storage recommendation
- Cost estimation

Fleet Manager

CONSISTENT ADMINISTRATION ACROSS WINDOWS AND LINUX SERVERS

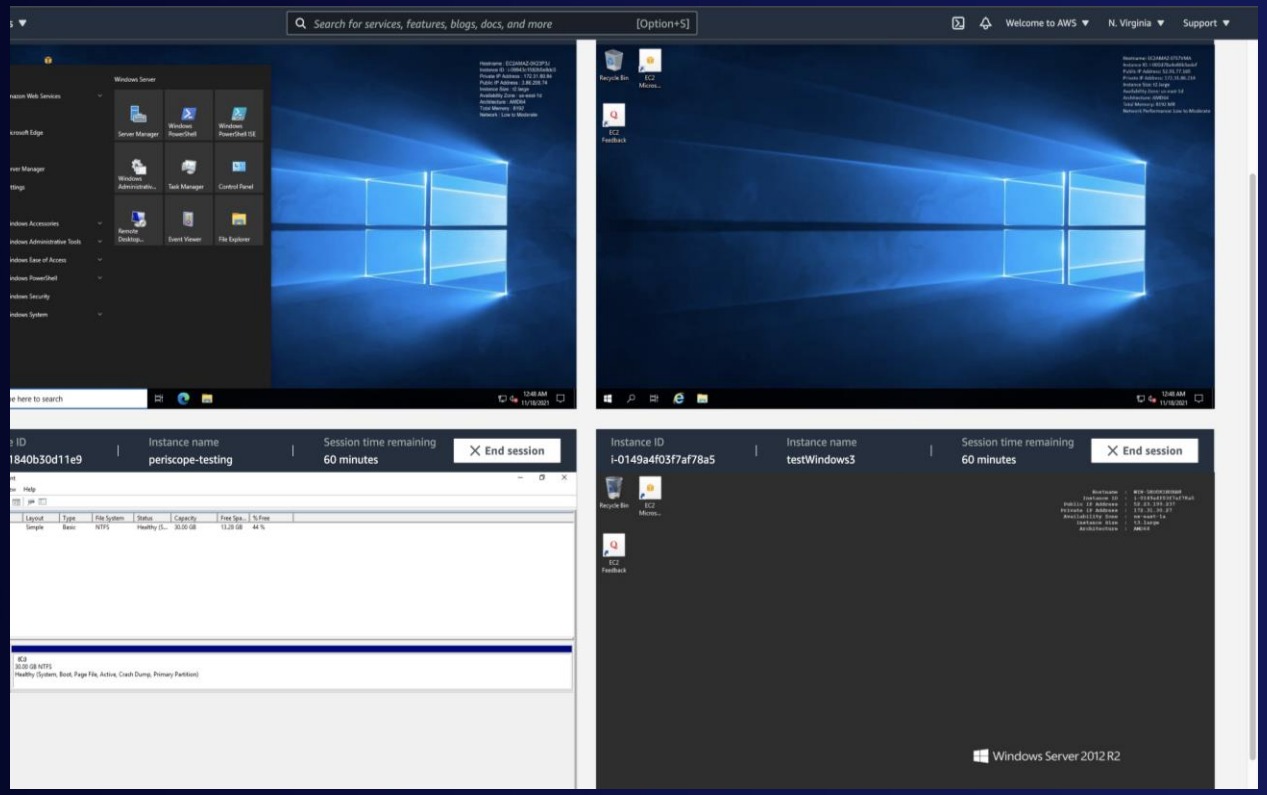
Manage and troubleshoot your Windows and Linux servers running on AWS and on premises

Administer VM fleet without needing to remotely connect with RDP or SSH

Perform common operations such as browsing file systems, monitoring CPU metrics, etc. from a single integrated console

Secure point-and-click Windows management

CONSOLE-BASED MANAGEMENT FOR WINDOWS IN AWS SYSTEMS MANAGER



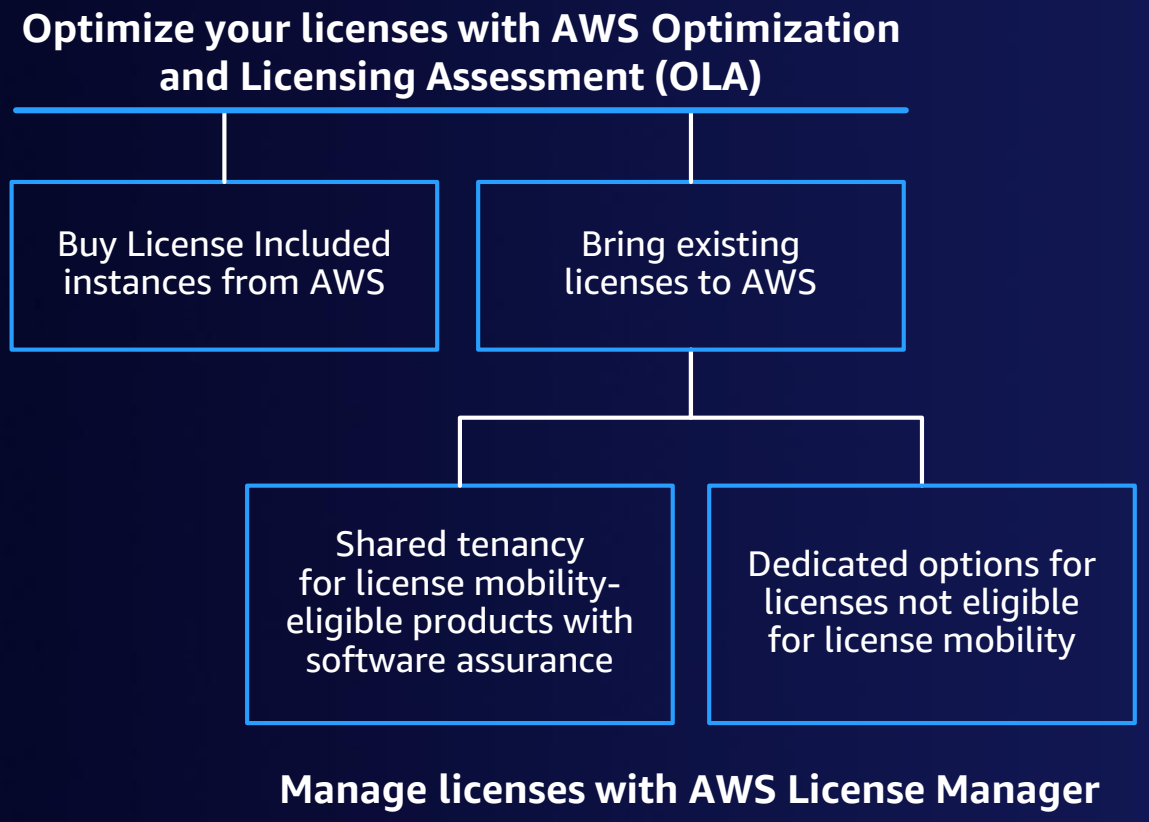
Graphical user interface built using high-performance NICE DCV protocol and Session Manager

Secure and operationally efficient

Single Sign-On using AWS SSO identities and third-party identity providers

License management & optimization

Flexible licensing options for Windows on AWS

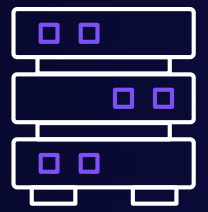


1. **Bring your licenses to AWS (BYOL)**
   Save costs with Dedicated Hosts

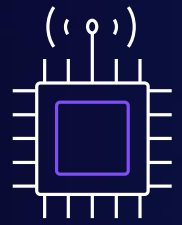
2. **Buy licenses included (LI) from AWS**
   Pay as you go with no upfront costs

3. **AWS License Manager**
   Manage, discover, and report software license usage

Evolution of products to simplify BYOL

2015	2018	2019	2020	2021
Windows BYOL	**Easier Tracking and Governance**	**“Cloud-like” Dedicated Hosts**	**Flexible Dedicated Hosts**	**License Flexibility**
				
Dedicated hosts	License Manager	Dedicated Hosts integration with AWS License Manager	License Included (LI) Windows Server on Dedicated Hosts	LI ←→ BYOL Shared ←→ Dedicated

Simplified Windows and SQL Server BYOL



Flexibility

Dedicated Hosts allow you to use your existing per-socket, per-core, or per-VM software licenses

Reduced management

Integrated with AWS License Manager, helping you manage your software licenses

Visibility

Improved visibility into core utilization of Dedicated Host, helping you manage per-socket or per-core software licensing

AWS Optimization and License Assessment (OLA)

Collect

Determine prospective workloads to optimize, and provide existing utilization data or collect utilization data for the underlying workloads using native AWS or third-party tooling

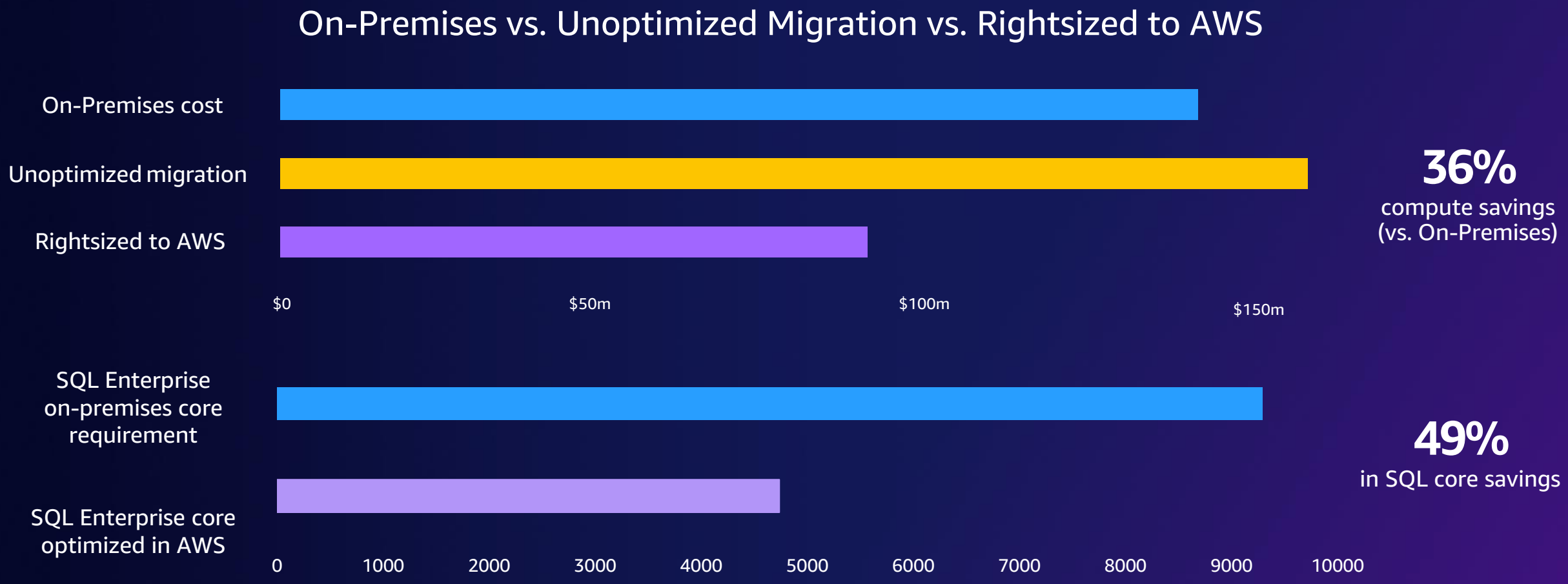
Analyze

Analyze the data to model cost and licensing optimization scenarios

Plan

Review the results and build your business case or start a migration proof of concept

Impact of Rightsizing

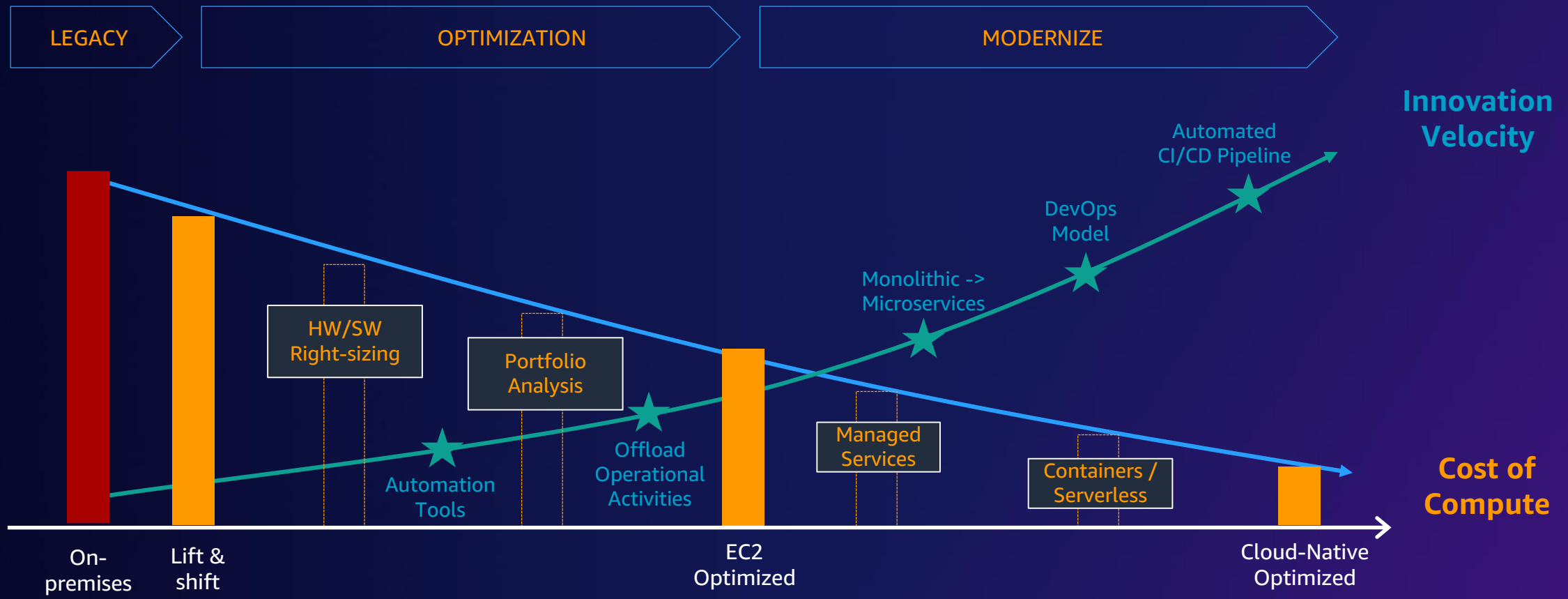


36%
compute savings
(vs. On-Premises)

49%
in SQL core savings

Modernization

Typical Modernization Journey



Why are customers modernizing applications on AWS?

Agility

- Decomposing monoliths to microservices brings freedom to adapt and experiment quickly
- Port and containerize .NET applications and deploy using cloud-native tooling

Lower costs

- No longer pay for expensive Windows and/or SQL Server licensing, saving more than 30% costs

Improve price/performance

- Amazon Aurora offers performance and availability of commercial-grade databases at 1/10th the cost
- .NET 6 with AWS Graviton2 offers 40% better price/performance

Common migration and modernization pathways

Relocate / Rehost

Windows Applications

SQL Databases

Move to Cloud Infrastructure

- Apps / DBs run on VMs
- No code changes
- Customer operates everything above the infrastructure

On-Prem ➤ Cloud

Common migration and modernization pathways

Windows Applications

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On-Prem ➤ Cloud

Re-platform

Containerize Applications

- Develop & deploy faster
- Application portability
- No code changes

VMs ➤ Containers

Managed Databases

- Managed provisioning, backups, patching, monitoring & scaling
- No code changes

Self-Serve ➤ Managed

Common migration and modernization pathways

	Relocate / Rehost	Re-platform	Refactor
Windows Applications	Move to Cloud Infrastructure  VMC on AWS WinEC2 SQL on EC2	Containerize Applications • Develop & deploy faster • Application portability • No code changes  ECS EKS VMs ➤ Containers	Move to Open Source • License freedom/savings • Performance improvement • Cross-platform support .NET .NET Framework ➤ .NET 6
SQL Databases	• Apps / DBs run on VMs • No code changes • Customer operates everything above the infrastructure On-Prem ➤ Cloud	Managed Databases • Managed provisioning, backups, patching, monitoring & scaling • No code changes  RDS SQL Self-Serve ➤ Managed	Move to Purpose-Built • High performance & scalability • Purpose-built database services • Licensing savings  Aurora DynamoDB Neptune Redshift SQL ➤ Aurora/DynamoDB/etc.

Windows modernization toolbox

Modernize within Windows

App2Container

End-of-support migration program for Windows

Modernize from Windows

Porting Assistant

Microservice Extractor for .NET

Move to purpose-built databases

Schema Conversion Tool

Database Migration Service

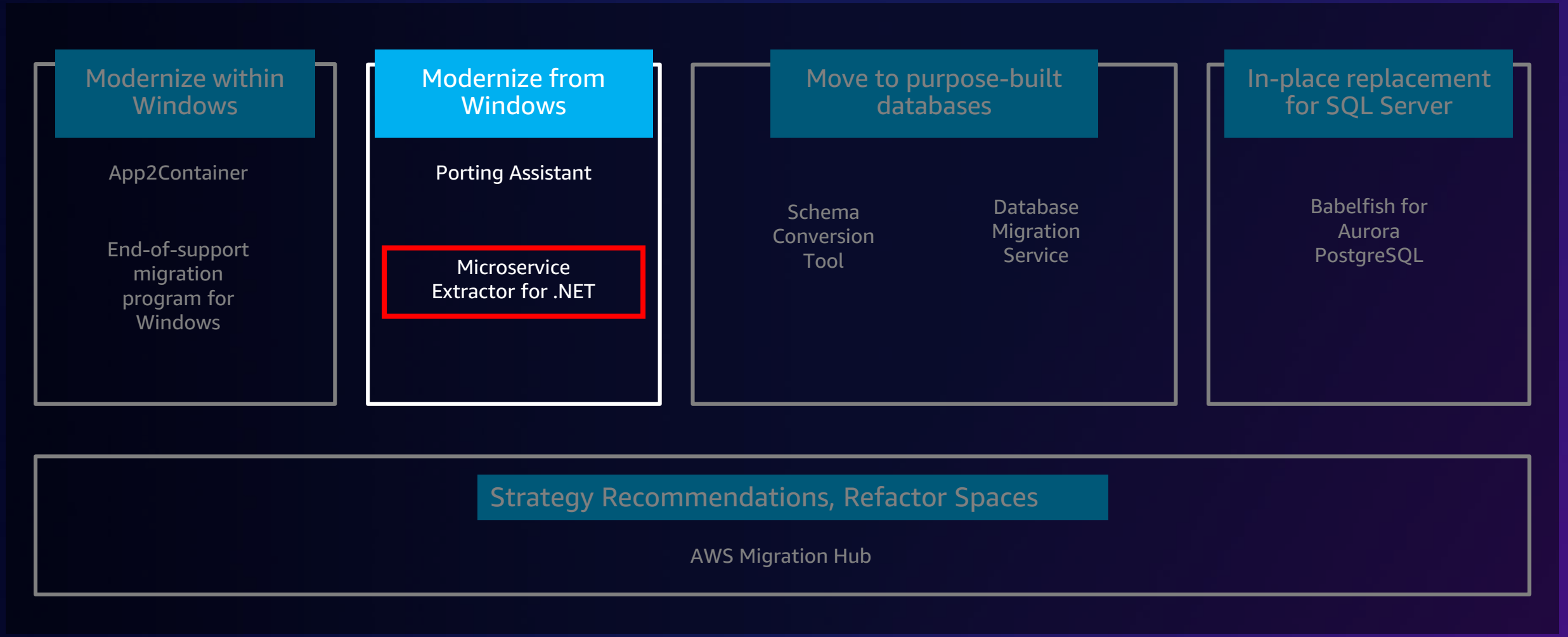
In-place replacement for SQL Server

Babelfish for Aurora PostgreSQL

Strategy Recommendations, Refactor Spaces

AWS Migration Hub

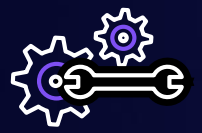
Windows modernization toolbox



Challenges of transforming .NET monolithic applications to microservices

Difficulty identifying parts of the application to be extracted as separate services

Challenges with grouping functionality based on business domains/process they relate to



Need to use multiple tools to co-relate source code and runtime metrics

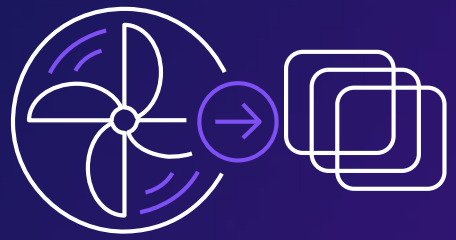
Manual work to carve out functionality and deploy it

AWS Microservice Extractor for .NET

Assistive tool that reduces effort to transform monolithic applications into microservices that teams can develop and operate independently

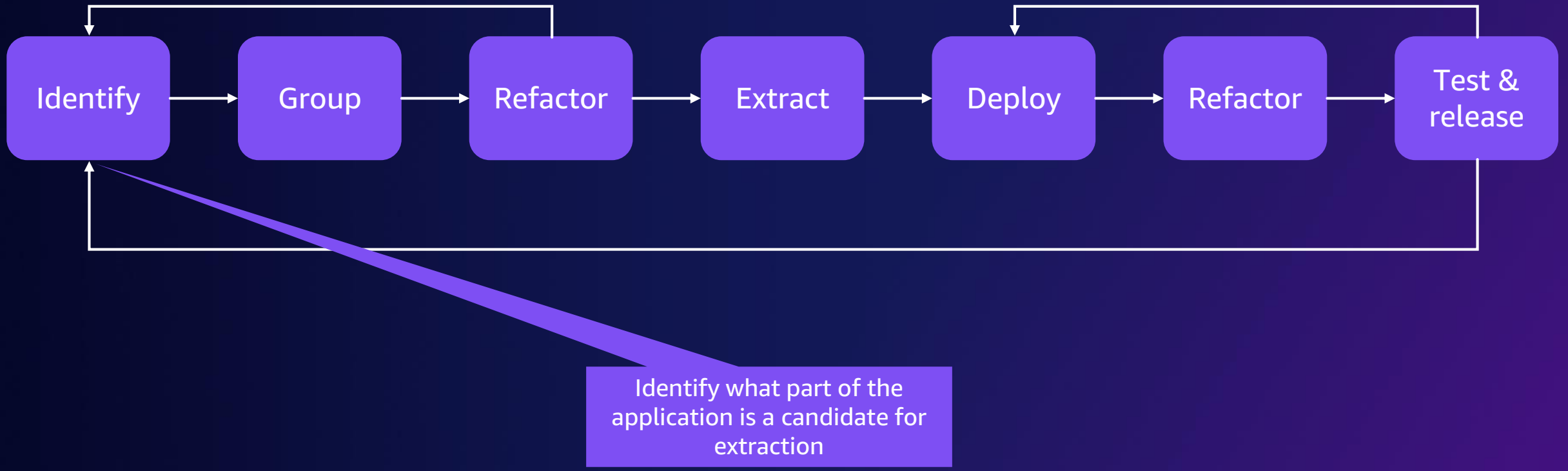
Faster identification of parts of the application to carve out as separate services

Facilitates planning of refactoring based on Domain-Driven Design



Assisted extraction of code into separate repositories

The manual refactoring process



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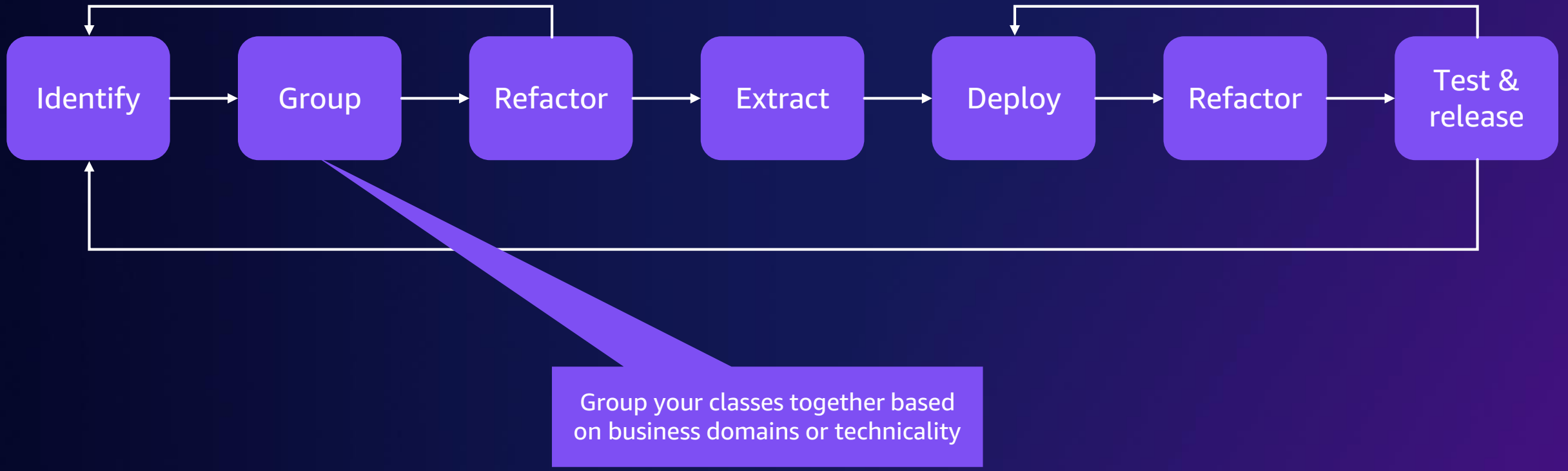

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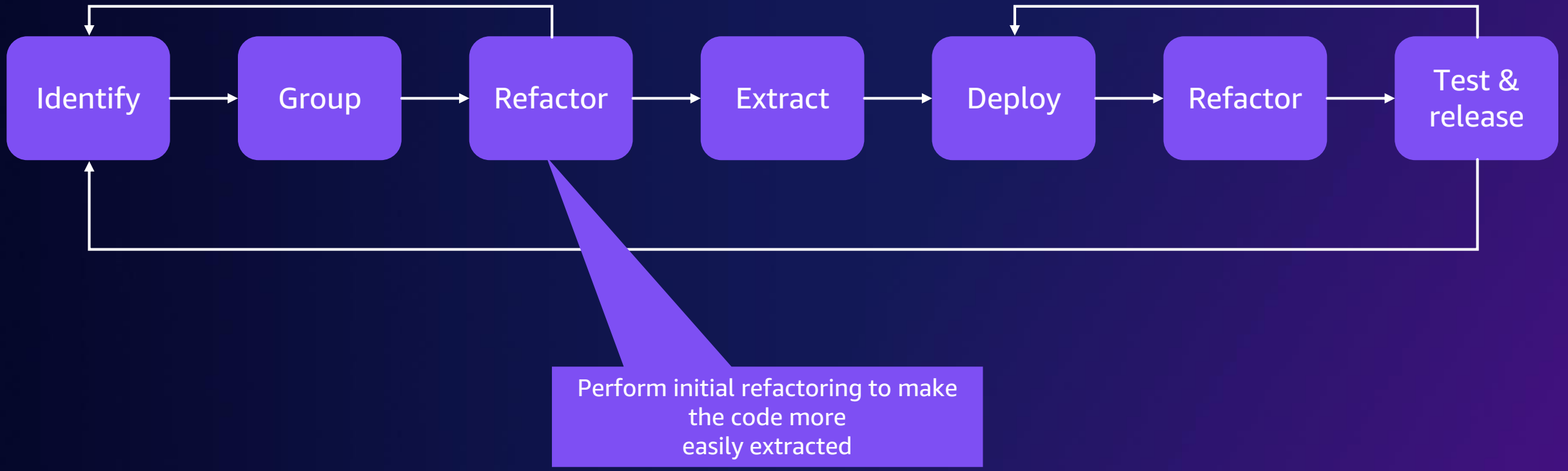

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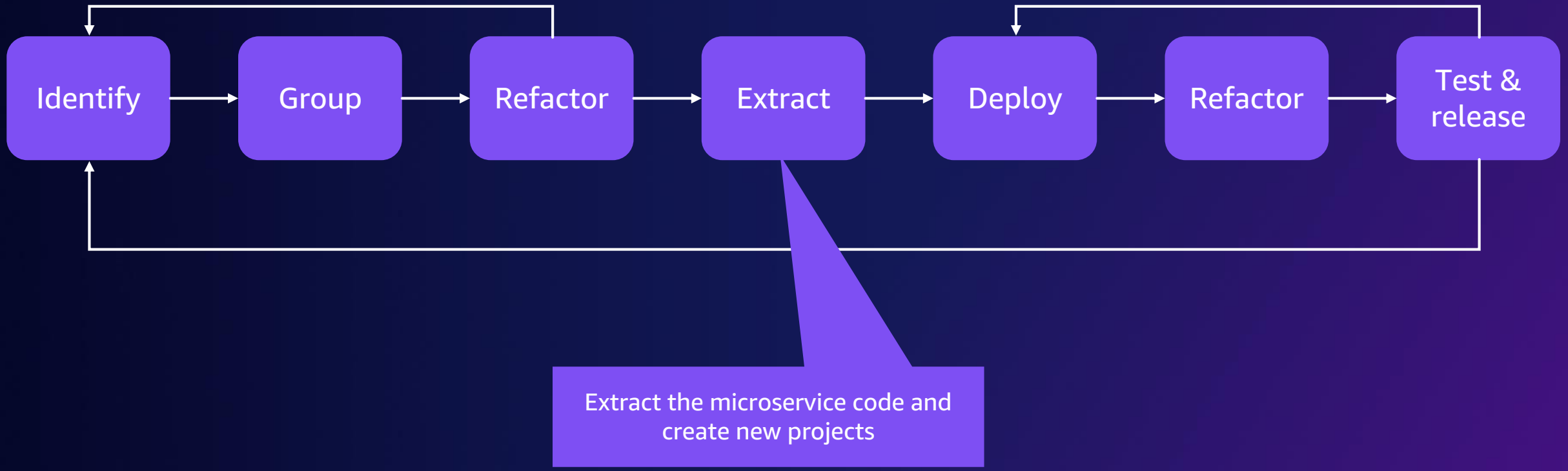

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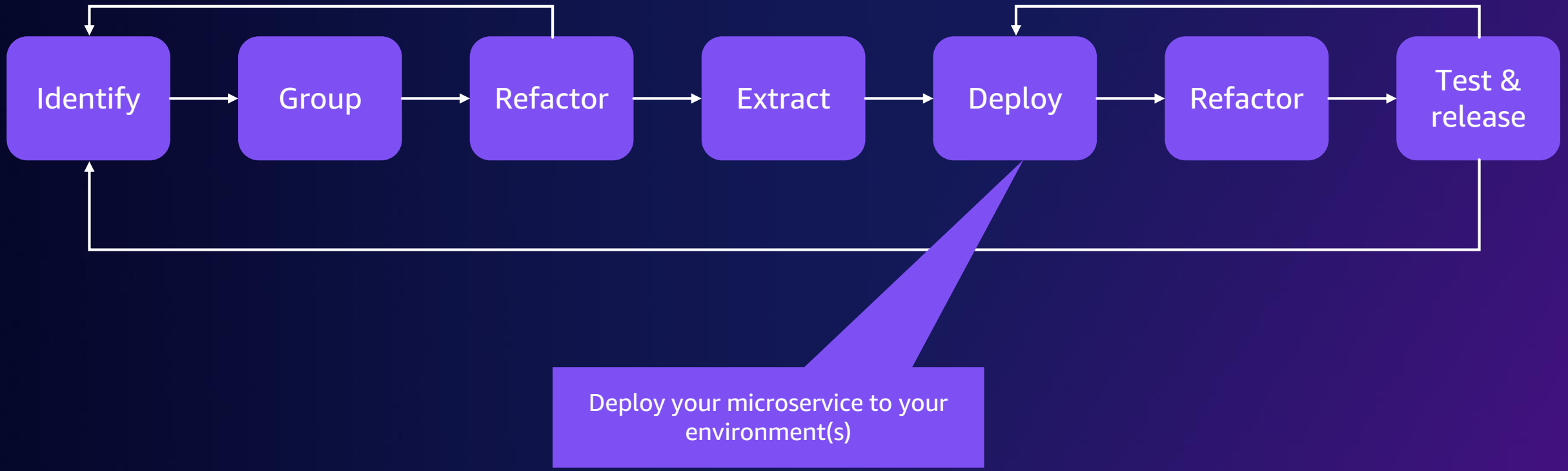

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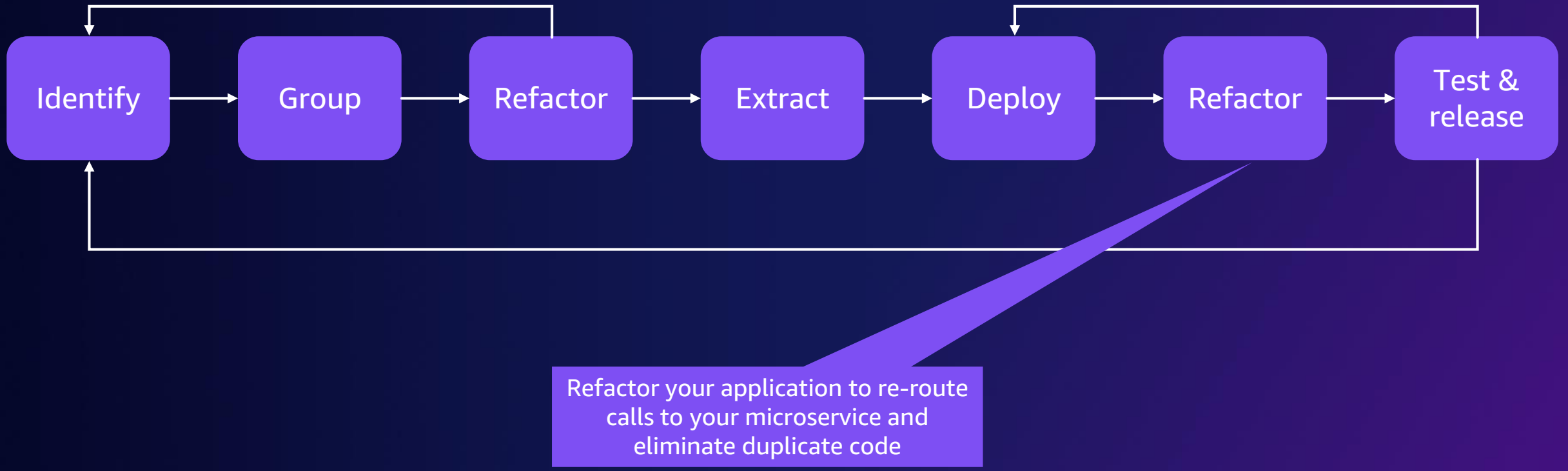

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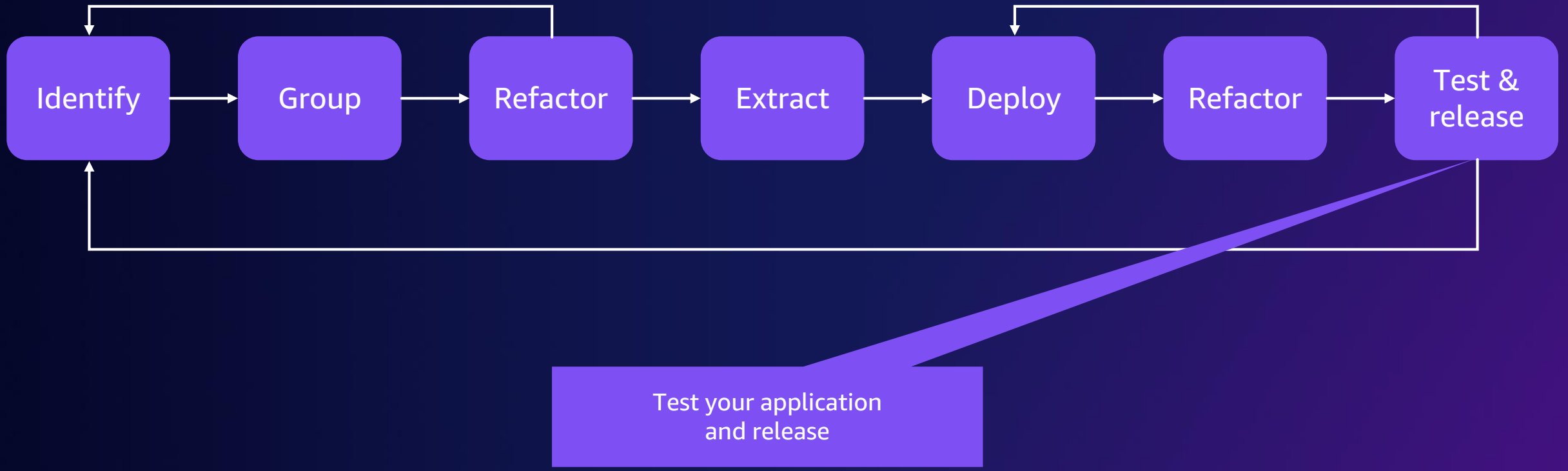


…with AWS Microservices Extractor for .NET

Reduced manual effort to transform the apps

How it works

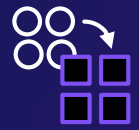
AWS Microservice Extractor for .NET

Download & install
Download and install on your server

Scan application
Scan your application by providing source code and runtime metrics

Group components
Identify components to be extracted from application map produced by the service

Prepare for extraction
Modify code to prepare application for extraction

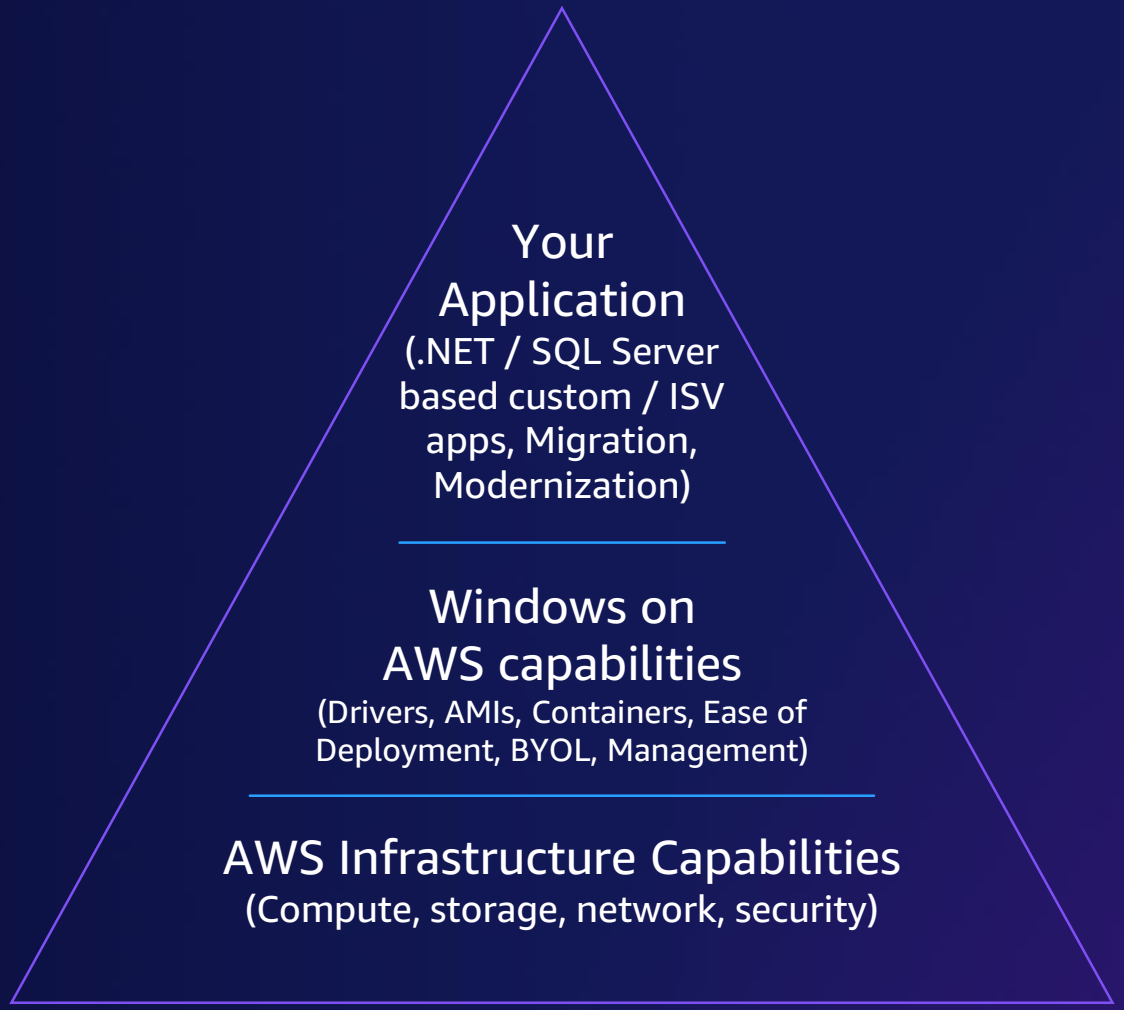


Extract
Use the tool to extract parts of the application's codebase as separate code repositories

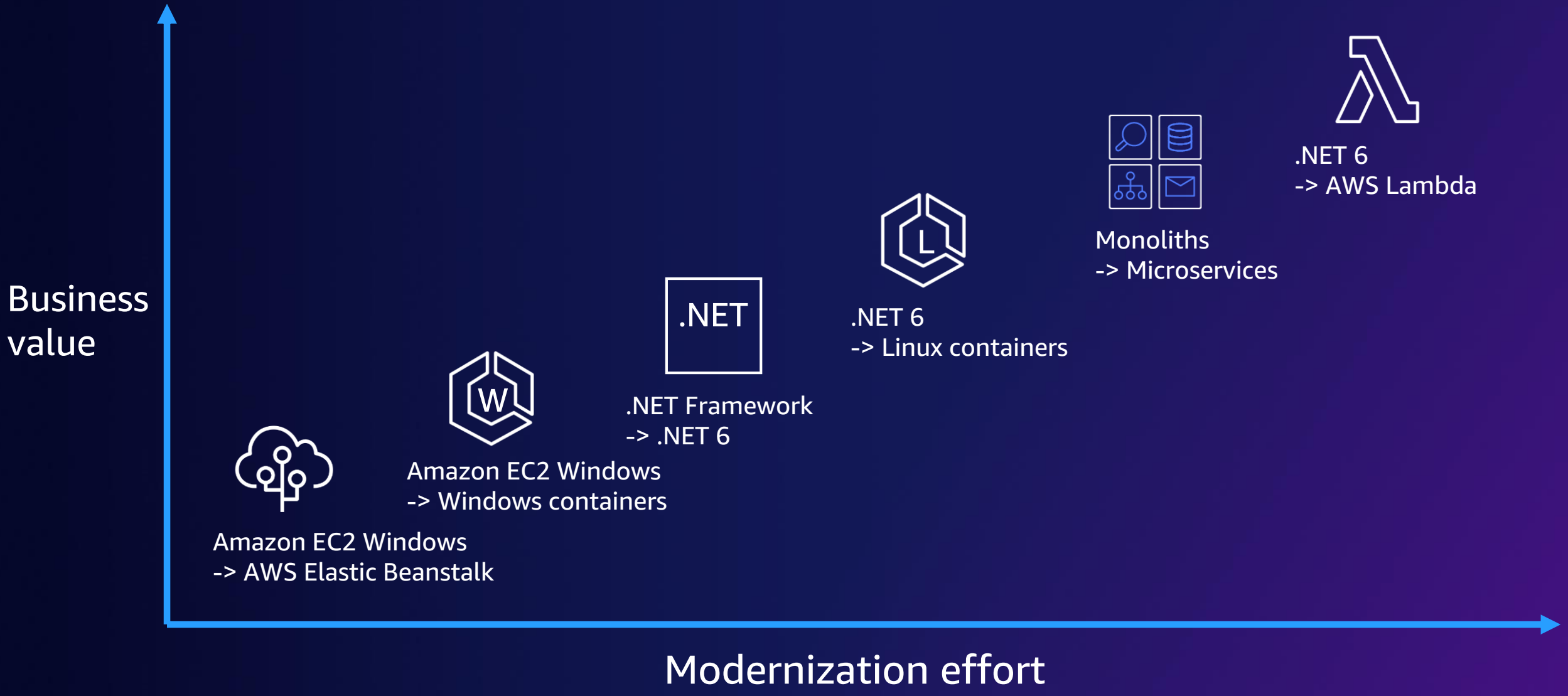
Build & Deploy
User may build and deploy the extracted code as independent services

Demo

Summary - Building blocks



Summary - .NET modernization journey



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