Evolution of Cloud Modernization
From Migration to Value

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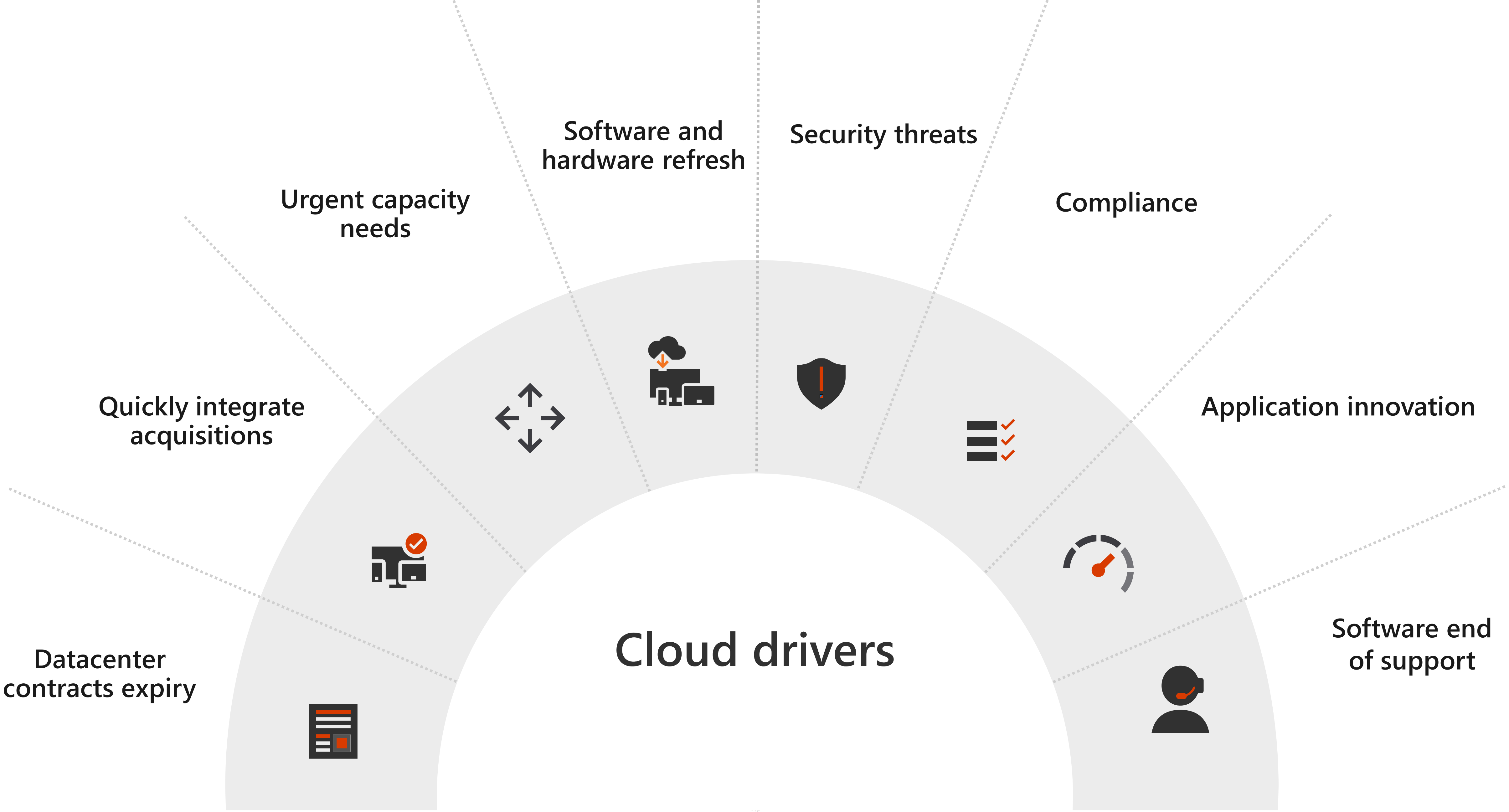
Chief Cloud Solutions Architect
Atea

Agenda

- Why and how migrate
- Size matters
- From VMs to...?
- The real cloud value



Cloud drivers

Datacenter contracts expiry

Quickly integrate acquisitions

Urgent capacity needs

Software and hardware refresh

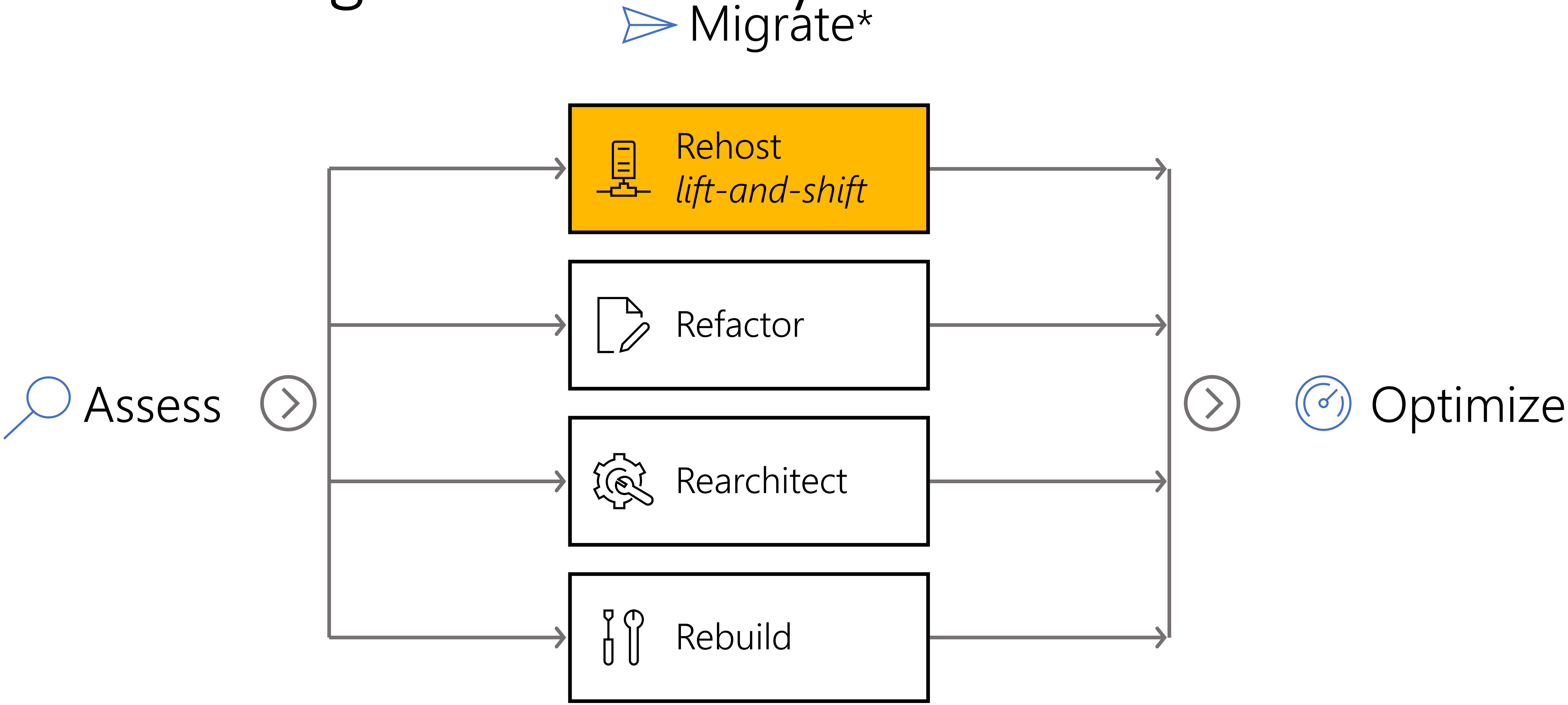
Security threats

Compliance

Application innovation

Software end of support

Azure Migration Journey



*These migration strategies are adopted from Gartner research. Gartner also calls out a 5th strategy called "Replace" with SaaS

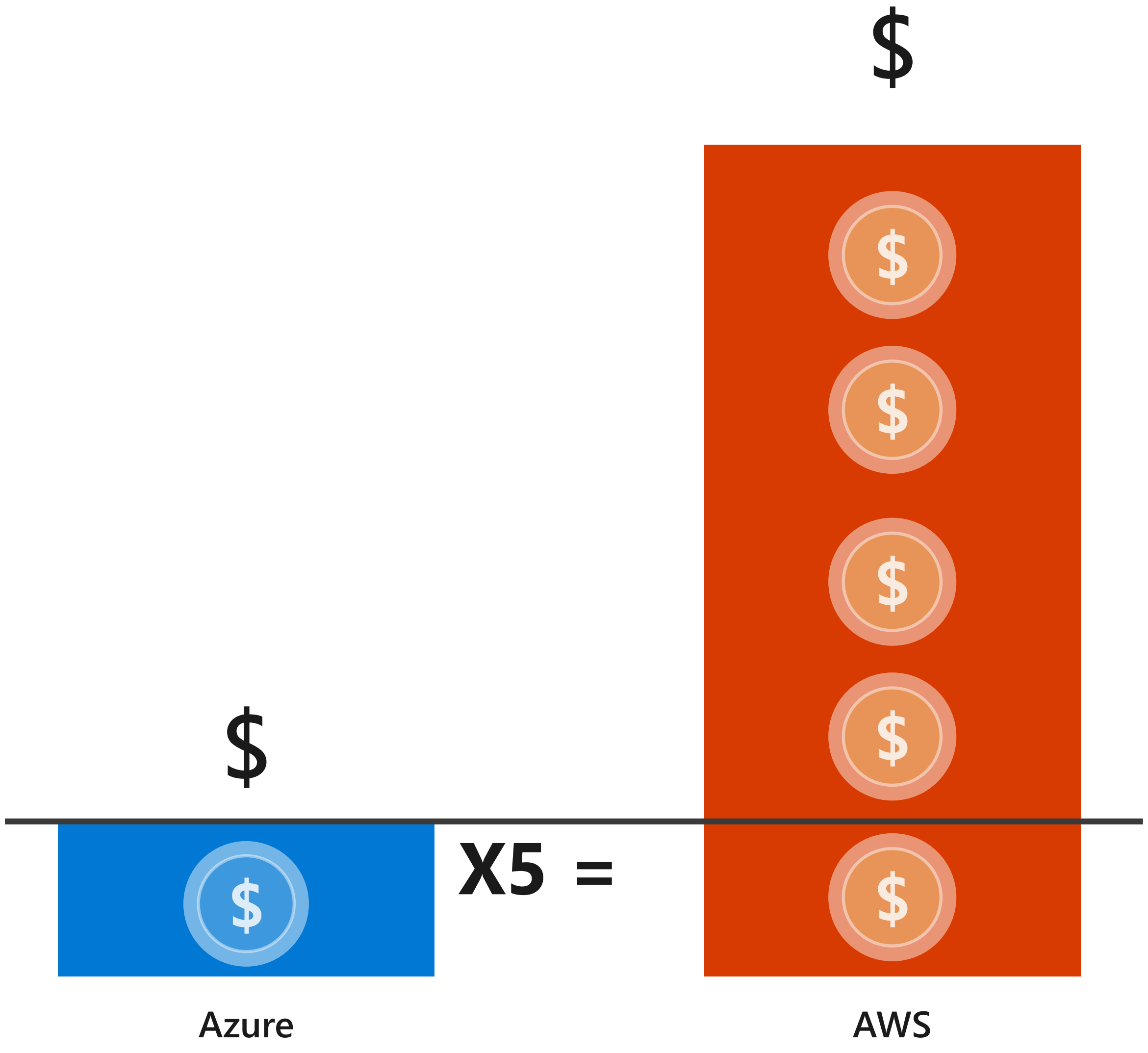
Windows Server and SQL Server on Azure

+ Azure Reserved Instances

+ Azure Hybrid Benefit

+ Dev/Test Checkbox

+ Free Extended Security Updates for 2008



1

Discover

- VMs
- Physical Servers
- VNETs
- Load Balancers
- Firewalls

- Roles
- Dependencies

- TCO
- ROI

2

Migrate

- Prepare pre-reqs.
  - Networking
  - Resource Groups
  - RBAC

- Replicate
- Deliver

- VMs
- VM Scale Sets
- Managed Instances

3

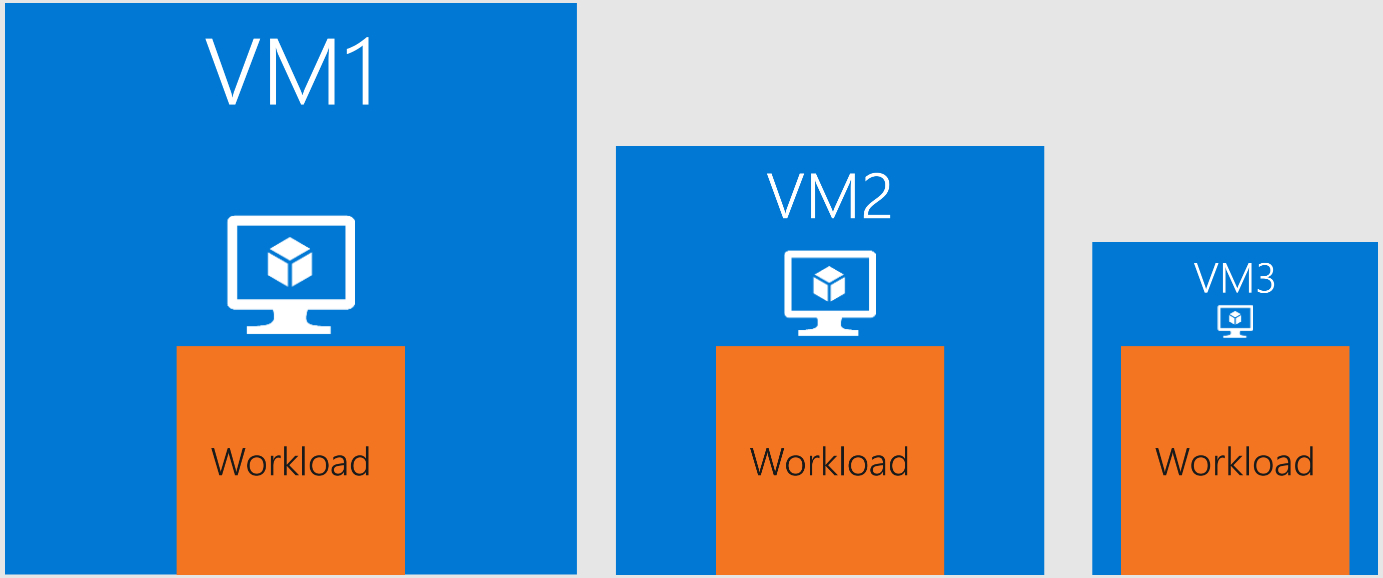
Optimize

- From VMs to Services
  - Containers
  - Microservices
  - App Services
  - DBs

Cost optimization is a key to cloud success

The workload will run fine in all three VM sizes

- Which will a developer naturally choose?
- Which will deliver more success to the business?
- Which one will make managers and finance want more things in the cloud?



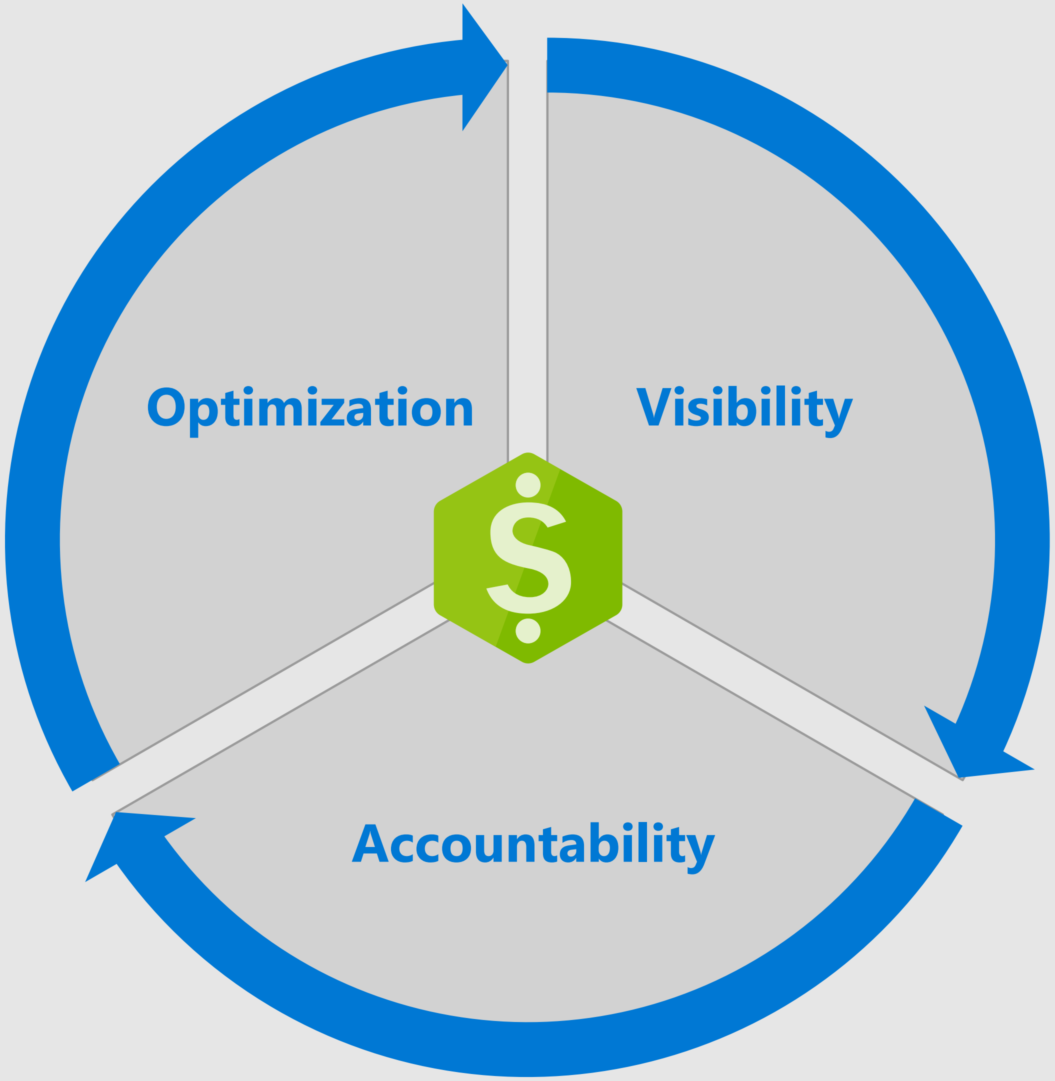
How do you know when there are opportunities to optimize?

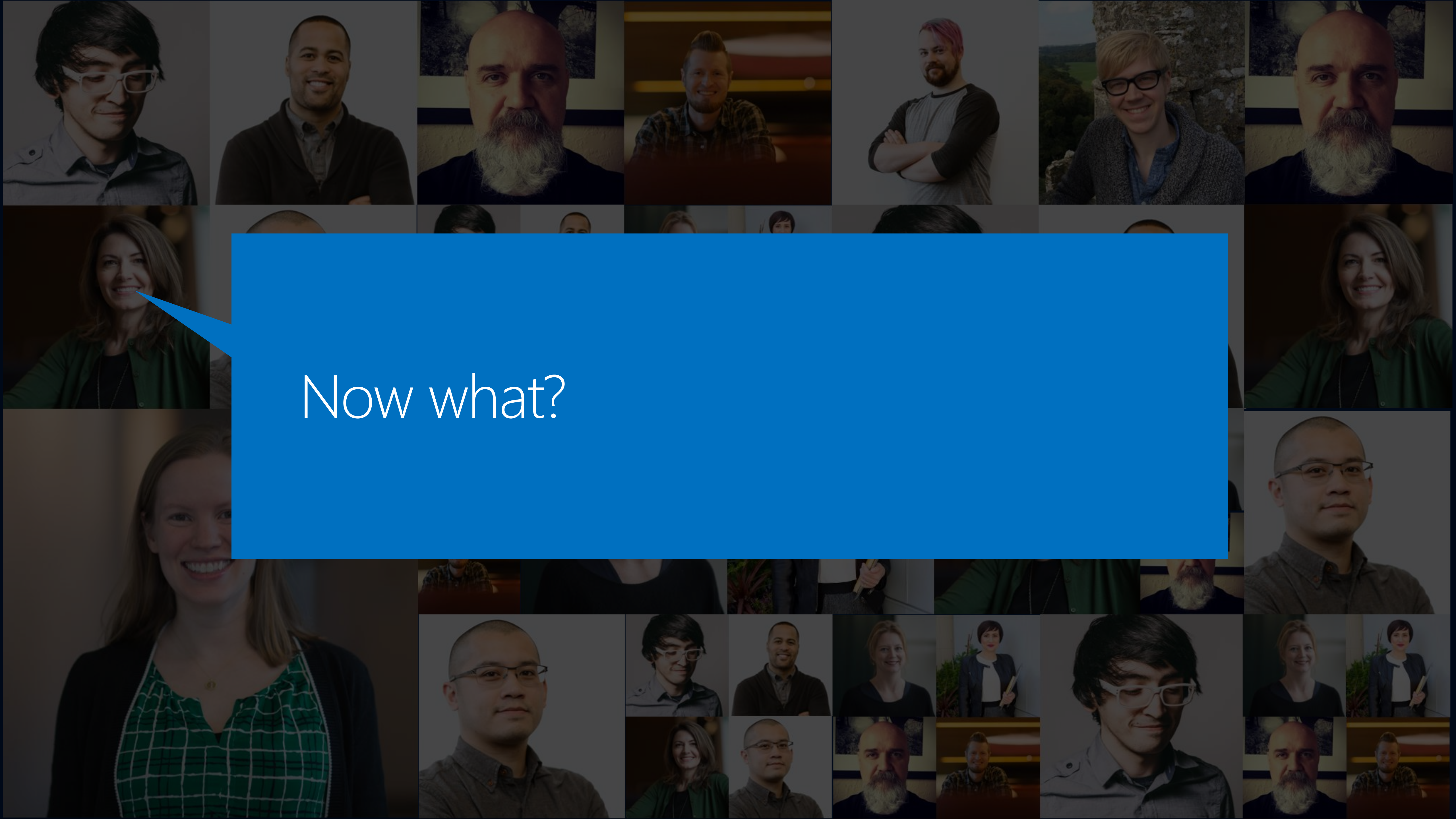
Continuous cost optimization process

Management

Finance

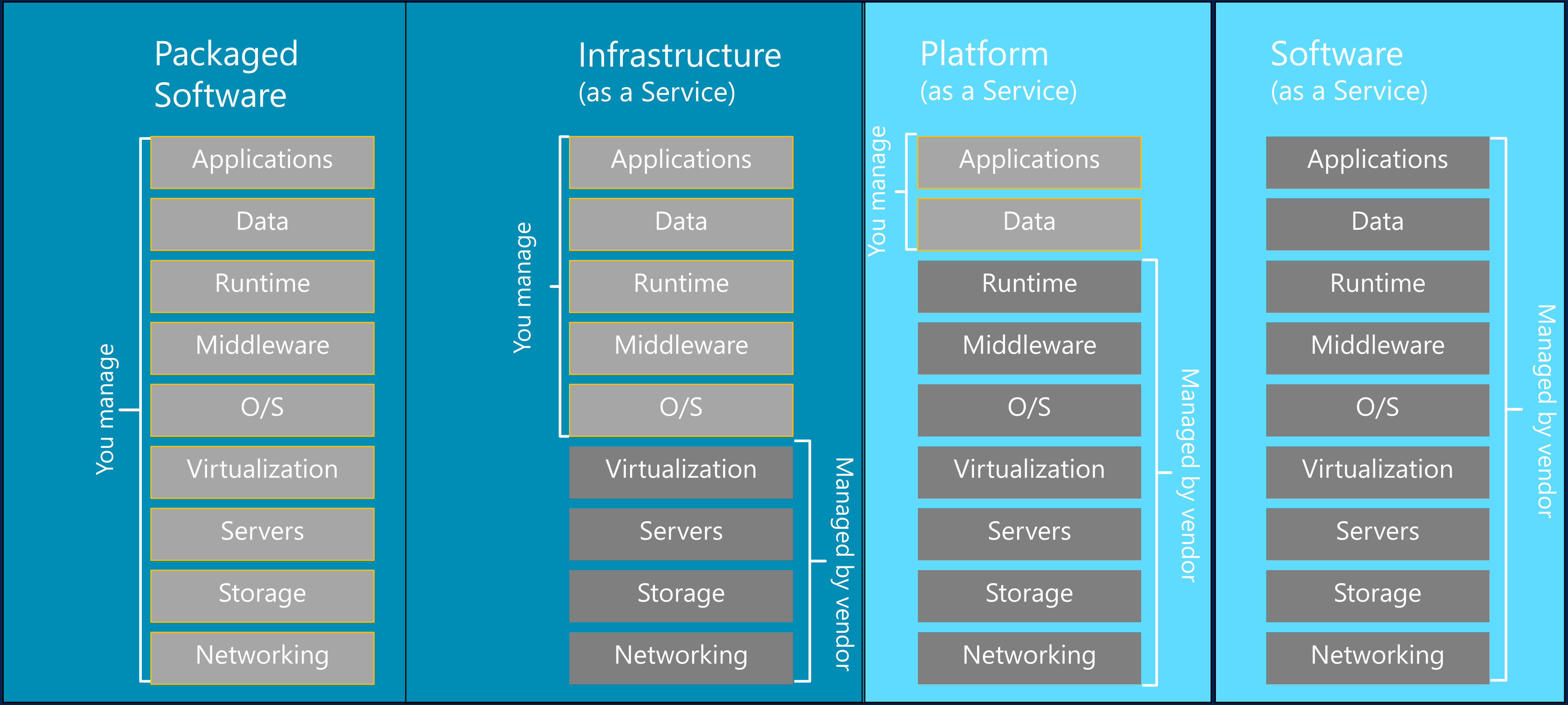
App teams





Now what?

Where do you see yourself?



Packaged Software

You manage

- Applications
- Data
- Runtime
- Middleware
- O/S
- Virtualization
- Servers
- Storage
- Networking

Infrastructure (as a Service)

You manage

- Applications
- Data
- Runtime
- Middleware
- O/S

Managed by vendor

- Virtualization
- Servers
- Storage
- Networking

Platform (as a Service)

You manage

- Applications
- Data

Managed by vendor

- Runtime
- Middleware
- O/S
- Virtualization
- Servers
- Storage
- Networking

Software (as a Service)

Managed by vendor

- Applications
- Data
- Runtime
- Middleware
- O/S
- Virtualization
- Servers
- Storage
- Networking

© AP

RENA
MONROVIA

Breaking up the monolith

Into Microservices

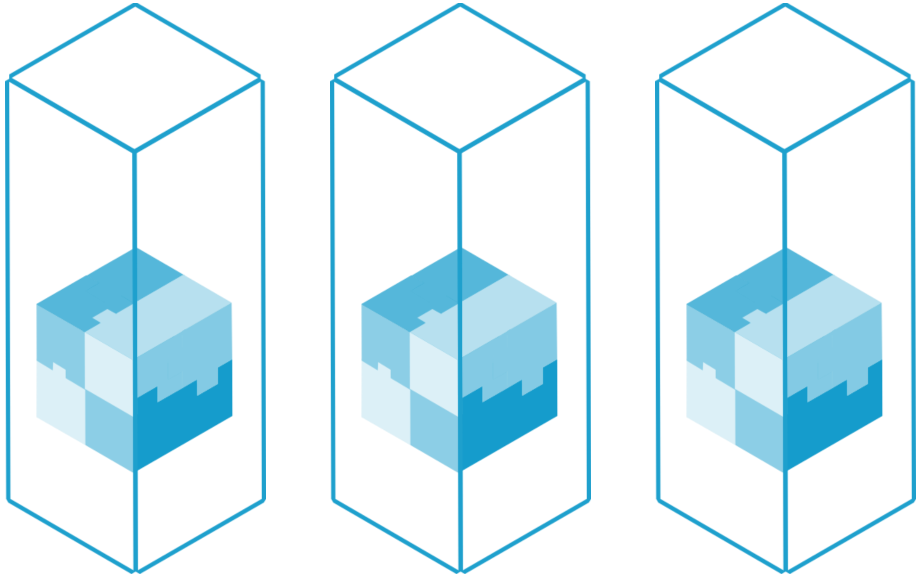
The Trouble With Monoliths

Tightly coupled components

- All components updated together
- Not agile, time to market suffers

Scale by cloning entire apps

- All components scaled similarly → expensive



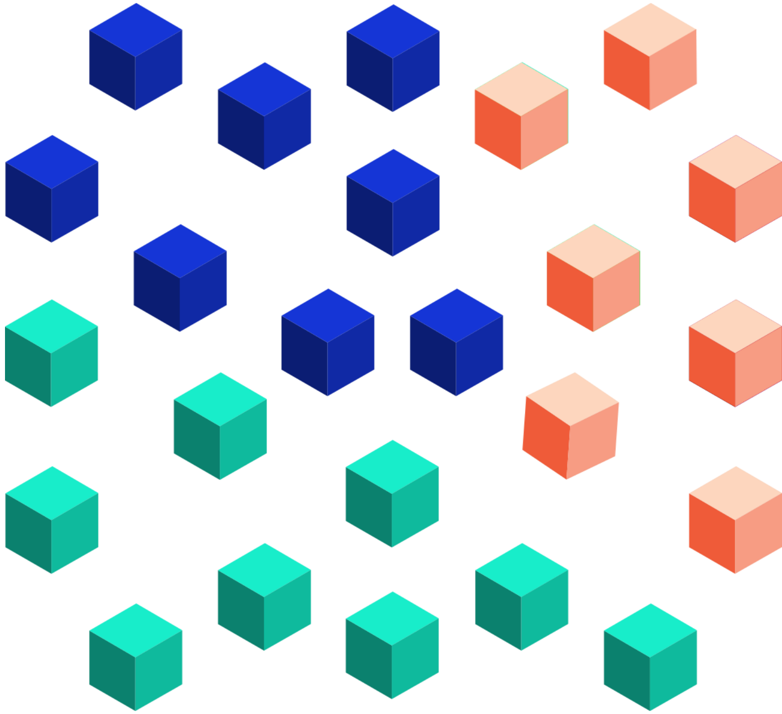
Microservices

Do one thing well

- Manage independent code and state
- Are generally developed by a small cross-functional team
- Are built with task-appropriate languages/frameworks

Are loosely coupled

- Communicate over well-defined interfaces/protocols
- Have unique names (URI) that can be resolved
- Are independently updated
- Are independently scaled



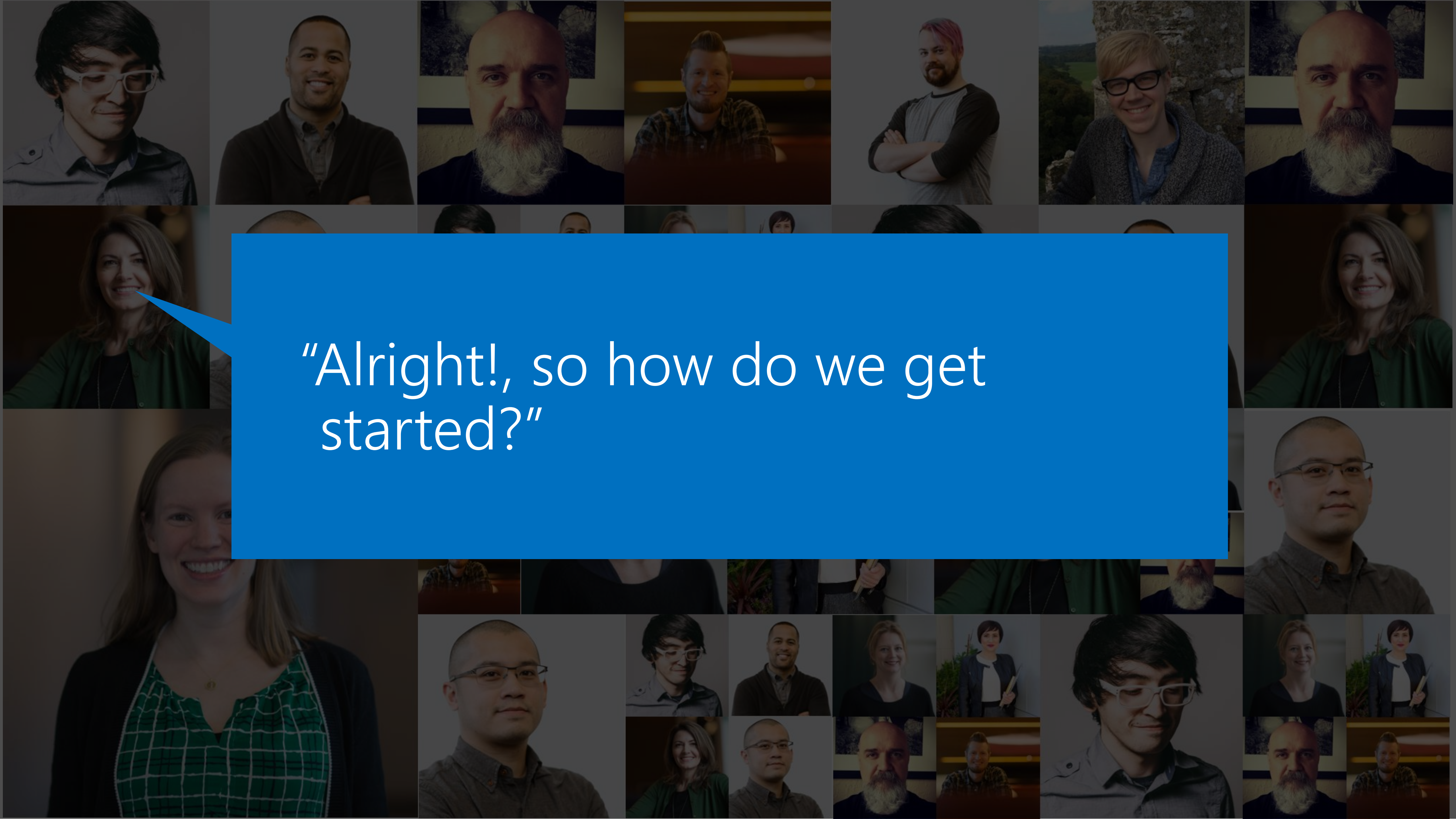
Why?

Higher density - reduce cost

Scale the things that needs scaling

Deliver more and faster

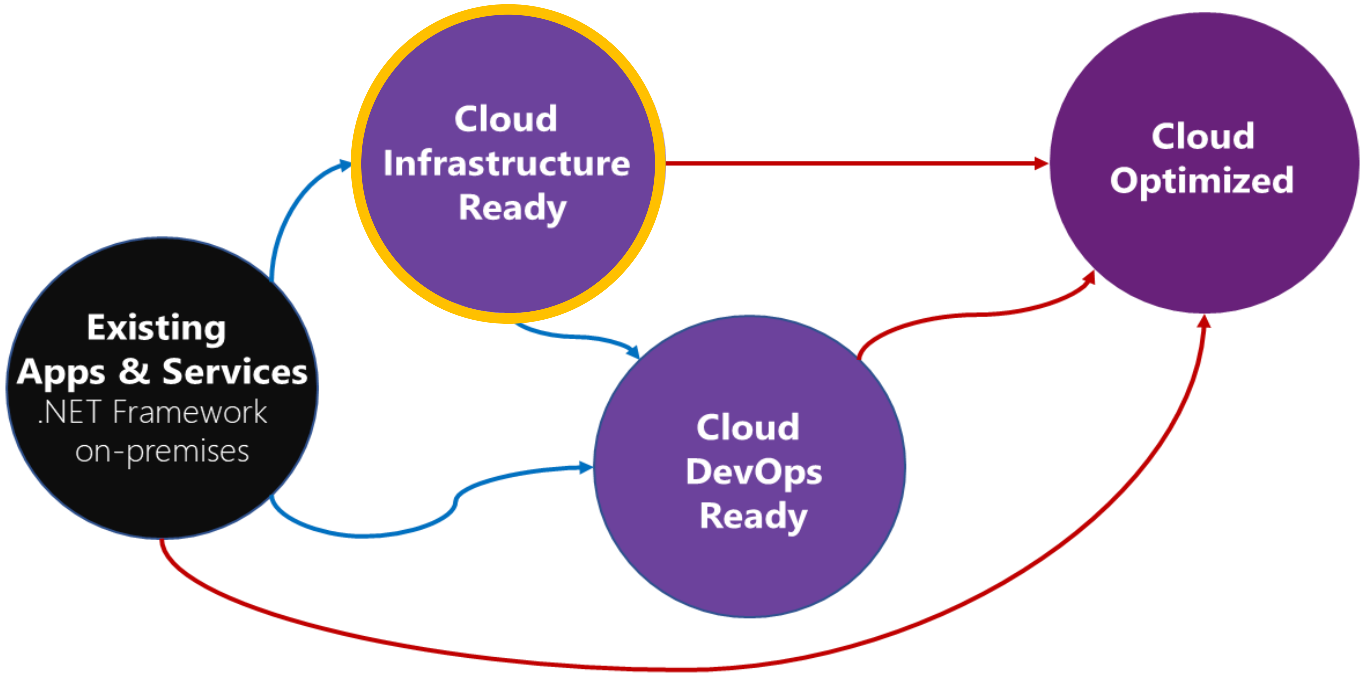
Deploy features independent from each other



“Alright!, so how do we get started?”

Cloud Maturity Model

Existing .NET Application Modernization approaches



- **Lift & Shift** approaches
- No code-changes

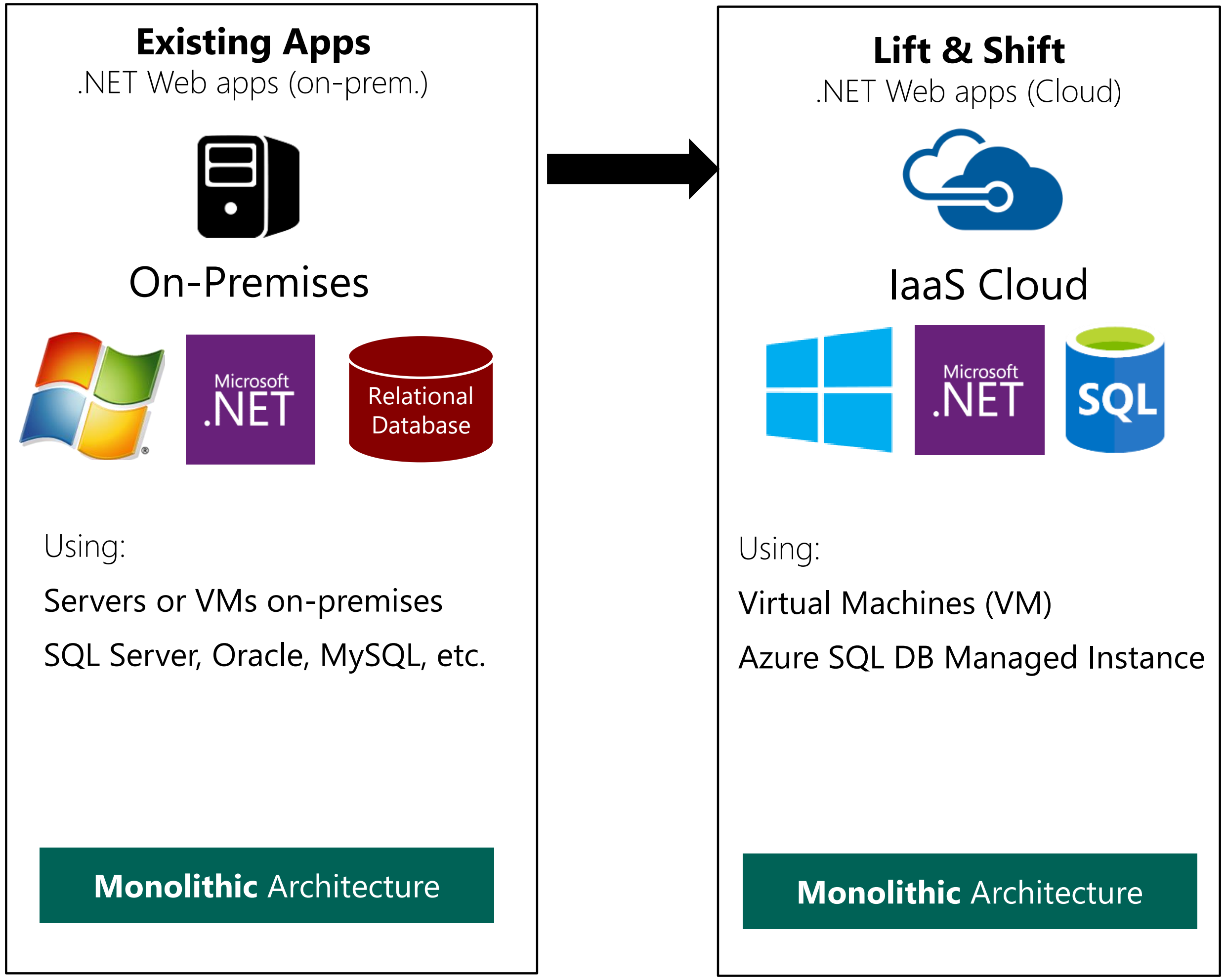
- **Architected for the cloud**
- Modernize/Refactor/Rewrite

1. Cloud Infrastructure ready

Simply **Rehost** your **on-premise application to IaaS on Azure**

PROS

- ✓ No re-architect or new code
- ✓ Least effort for quick migration
- ✓ Supported on the least common denominator on Azure
- ✓ Legacy & End of Life



Existing Apps
.NET Web apps (on-prem.)

On-Premises

Using:

Servers or VMs on-premises

SQL Server, Oracle, MySQL, etc.

Monolithic Architecture

Lift & Shift
.NET Web apps (Cloud)

IaaS Cloud

Using:

Virtual Machines (VM)

Azure SQL DB Managed Instance

Monolithic Architecture

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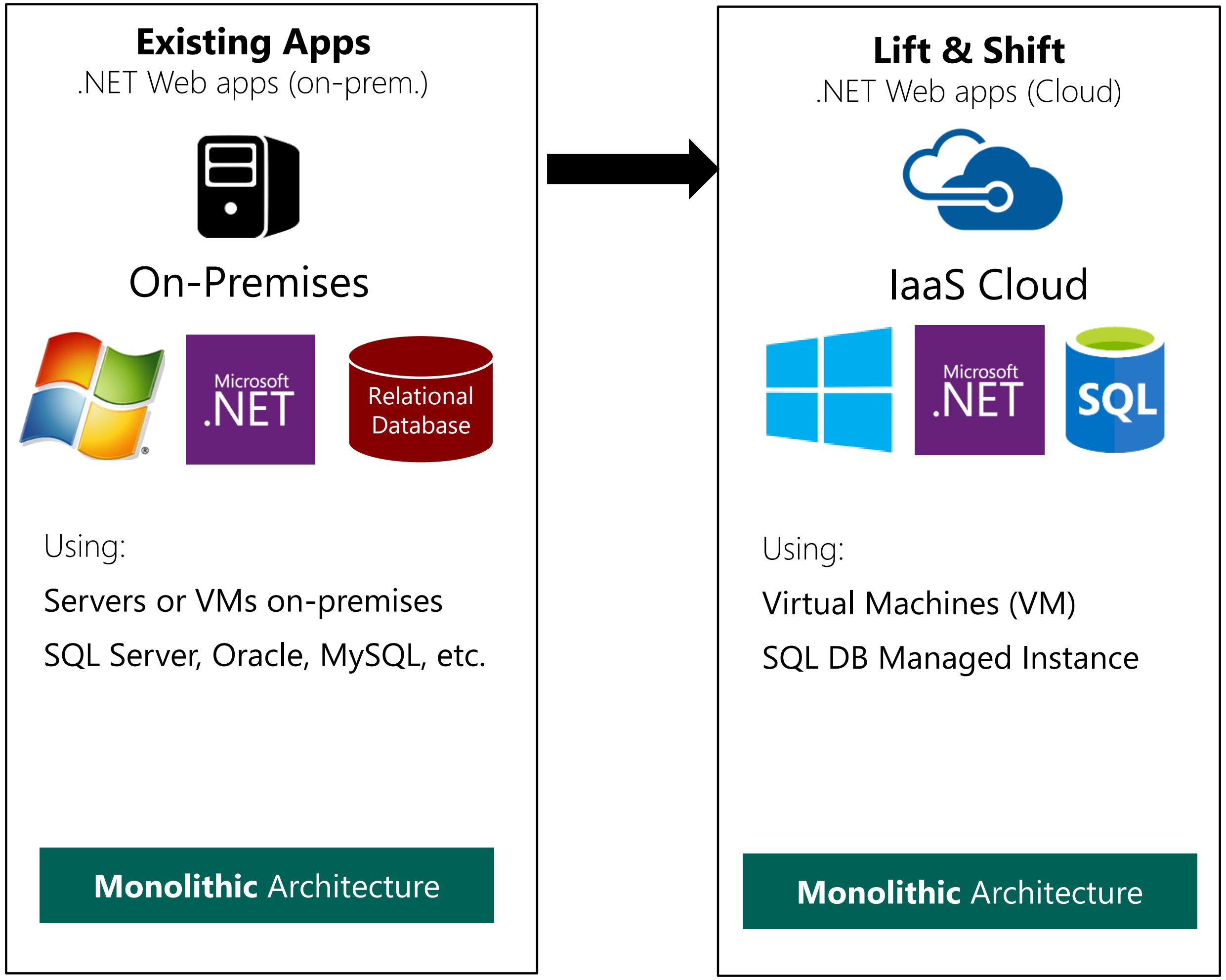
CONS

- × Smaller Cloud Value
- × Manual Patching, Upgrades
- × No Automated App Scaling and High Availability



Existing Apps

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On-Premises

Microsoft .NET

Relational Database

Using:

Servers or VMs on-premises

SQL Server, Oracle, MySQL, etc.

Monolithic Architecture

Lift & Shift

.NET Web apps (Cloud)

IaaS Cloud

Microsoft .NET

SQL

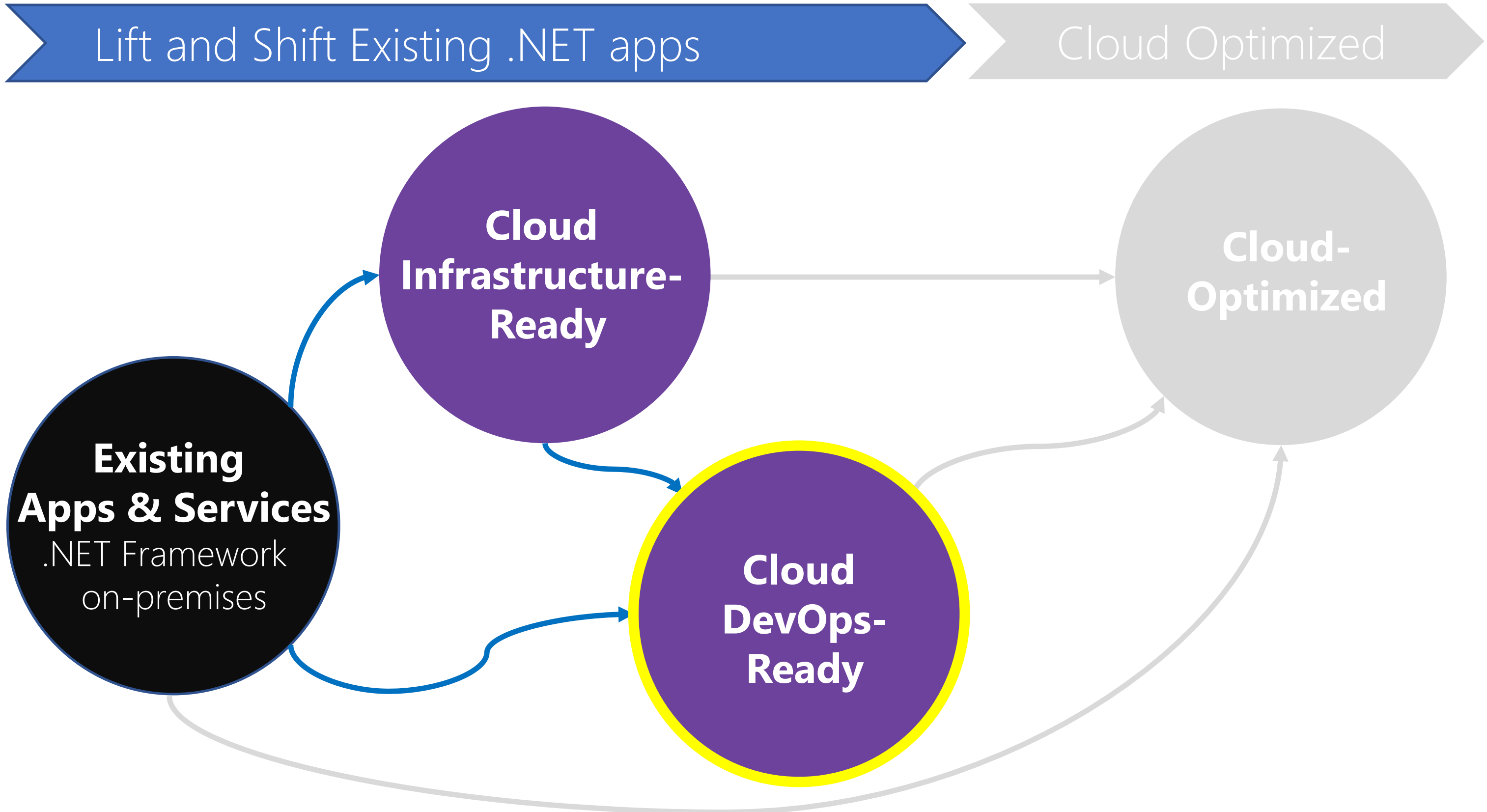
Using:

Virtual Machines (VM)

SQL DB Managed Instance

Monolithic Architecture

Modernization Maturity Model


Lift and Shift Existing .NET apps
Cloud Optimized
Cloud Infrastructure-Ready
Existing Apps & Services
.NET Framework on-premises
Cloud DevOps-Ready
Cloud-Optimized

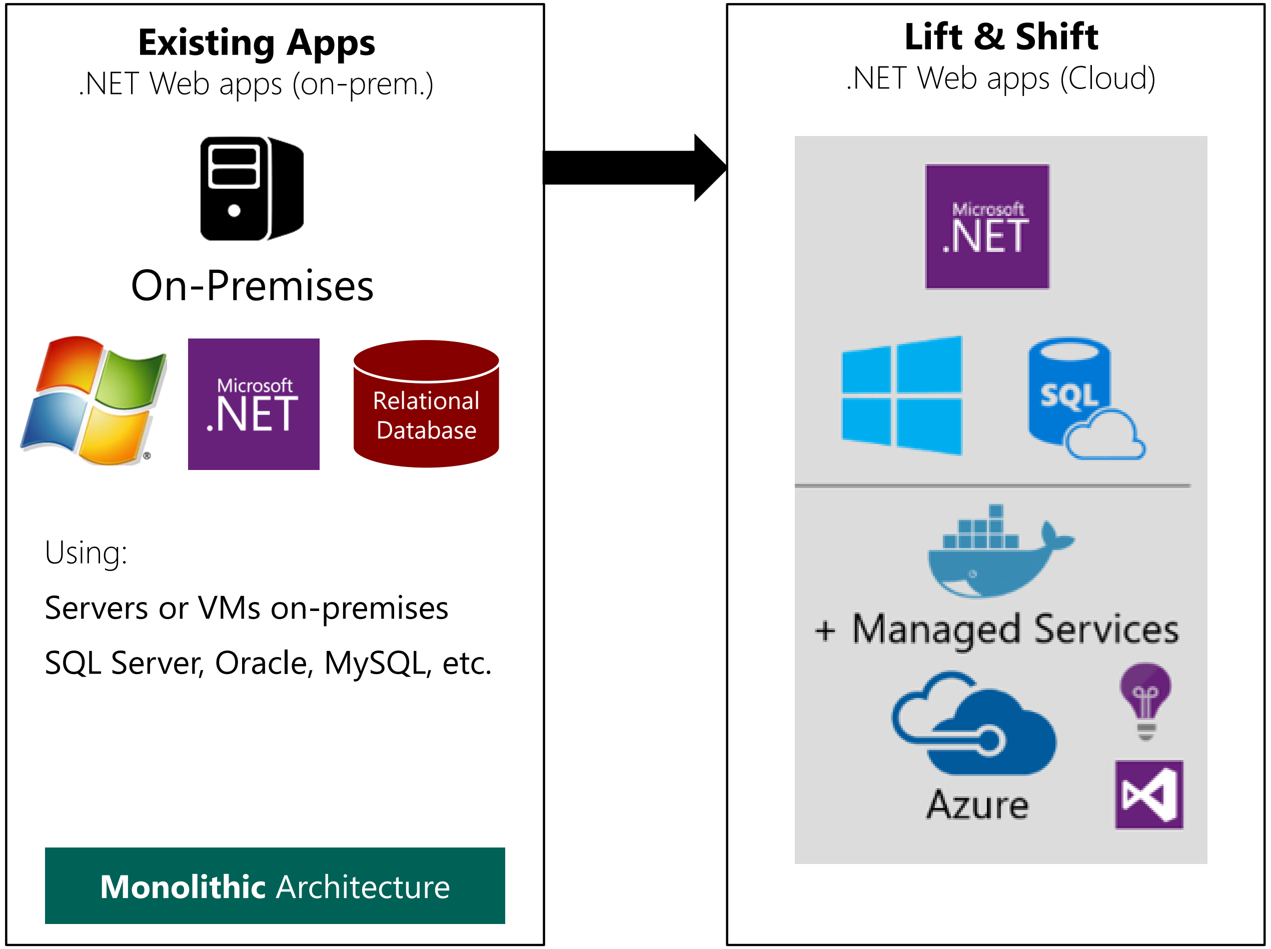
- **Lift and shift** approaches
- No code changes

2. Cloud DevOps ready

Get more Cloud benefit by **Containerizing** your app with **Windows Server Docker Containers** and deploying them to Azure cloud or on-premises.

PROS

- ✓ No re-architect or new code
- ✓ Increased density & lower deployment cost
- ✓ Improved productivity and DevOps agility
- ✓ Portability of apps and dependencies
- ✓ High availability and Orchestration with ACS/K8 and Service Fabric



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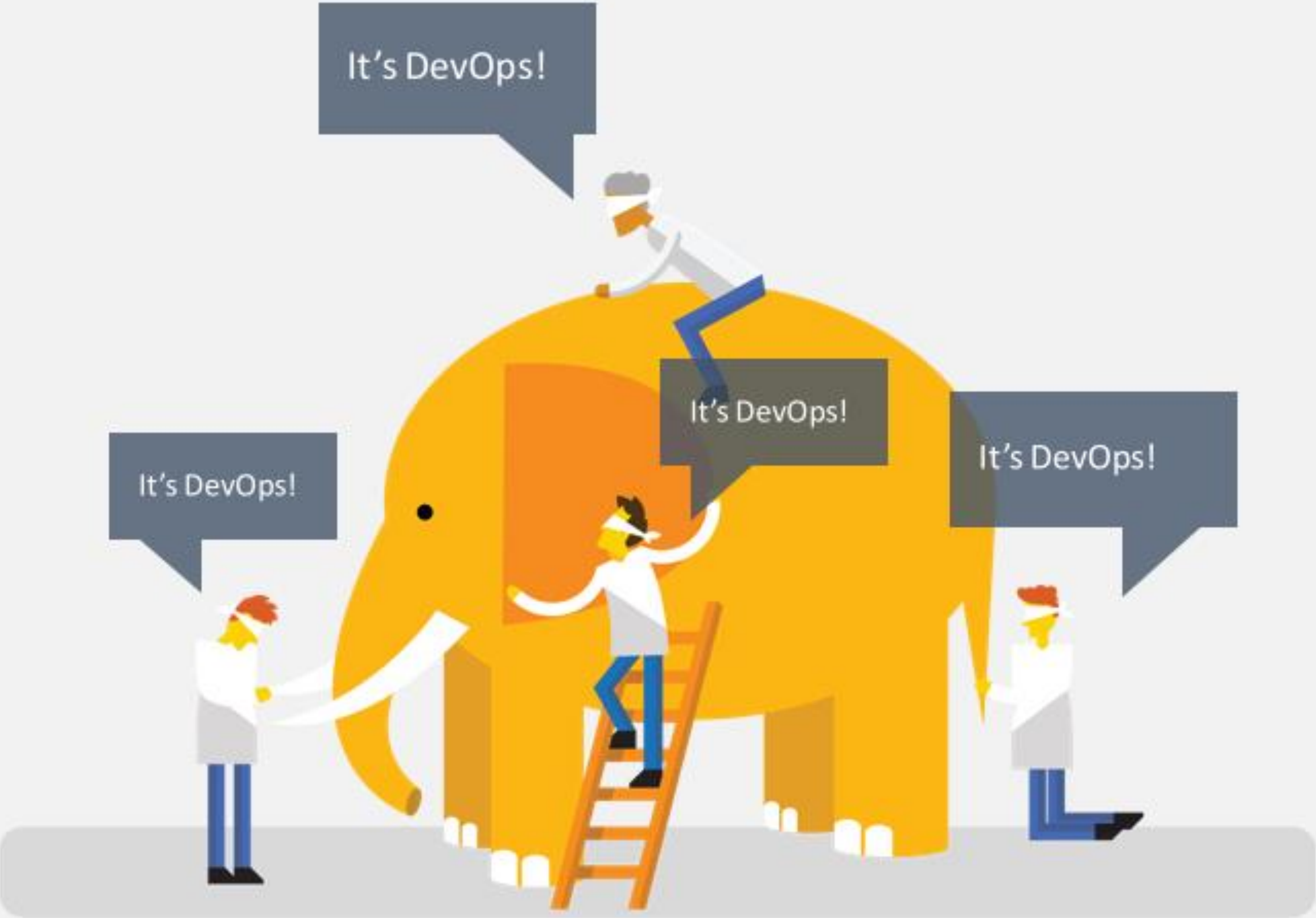
+ Managed Services


It’s DevOps!
It’s DevOps!
It’s DevOps!
It’s DevOps!

WORKED FINE IN DEV
OPS PROBLEM NOW
memegenerator.net

Docker Containers

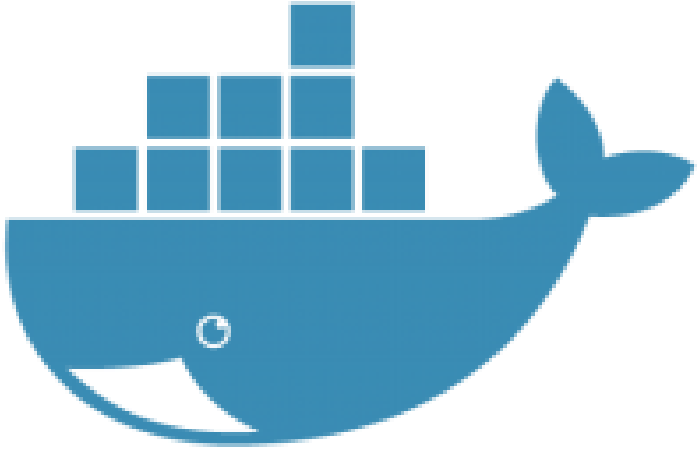
- Docker helps automating the deployment of applications as portable, self-sufficient containers that can run on any cloud or on-premises.

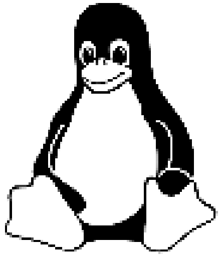
No more:
"It works in my dev machine!...
Why not in production?"

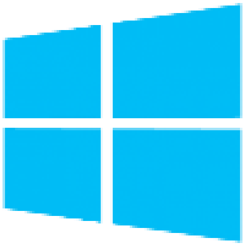
Now it is:
"If it works in Docker, it works in production"

Keywords about WHY Docker?

- ***Dependencies (self-sufficient)***
- ***Deployment***







Virtual Machines compared to **Docker Containers**

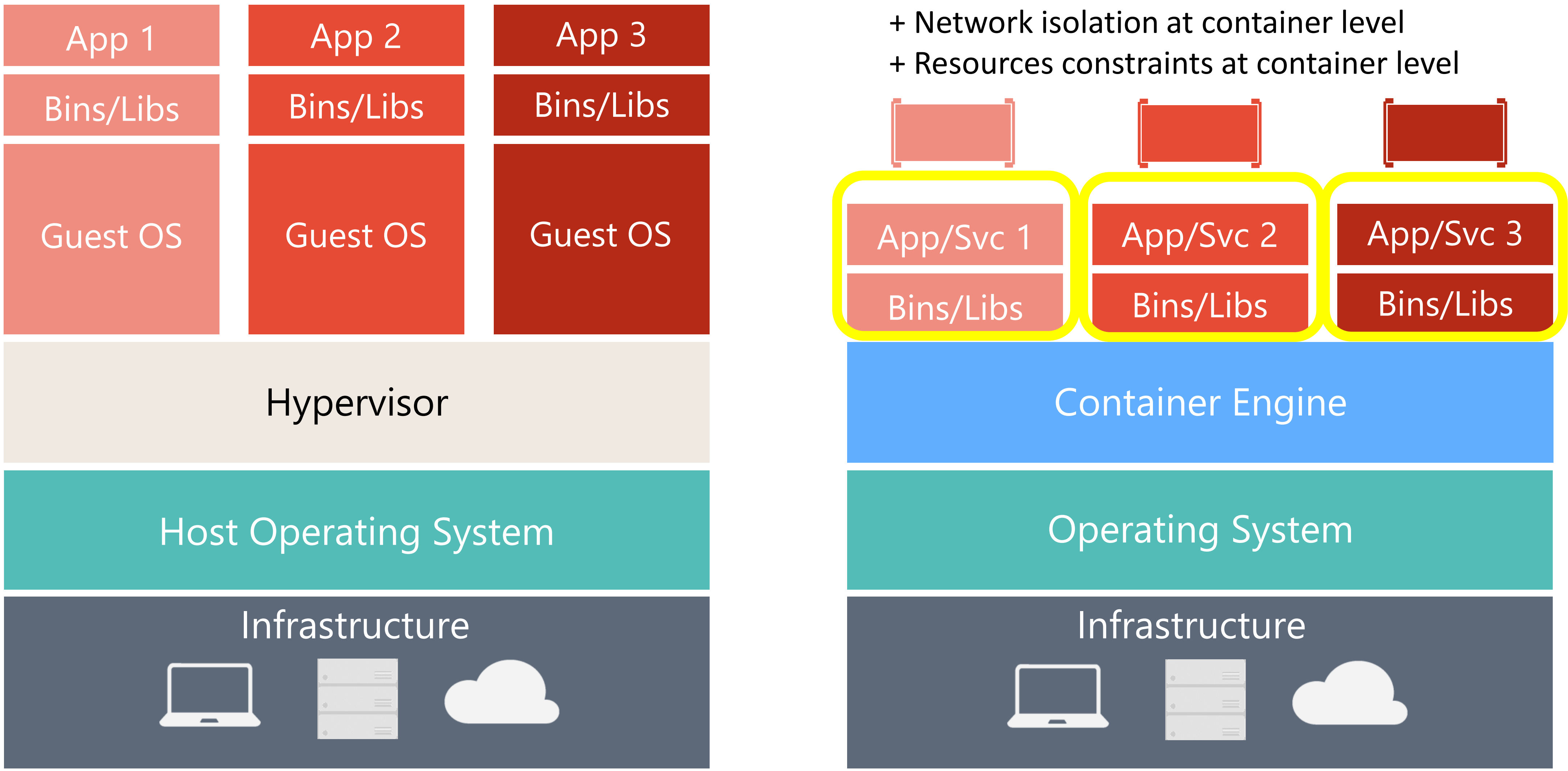
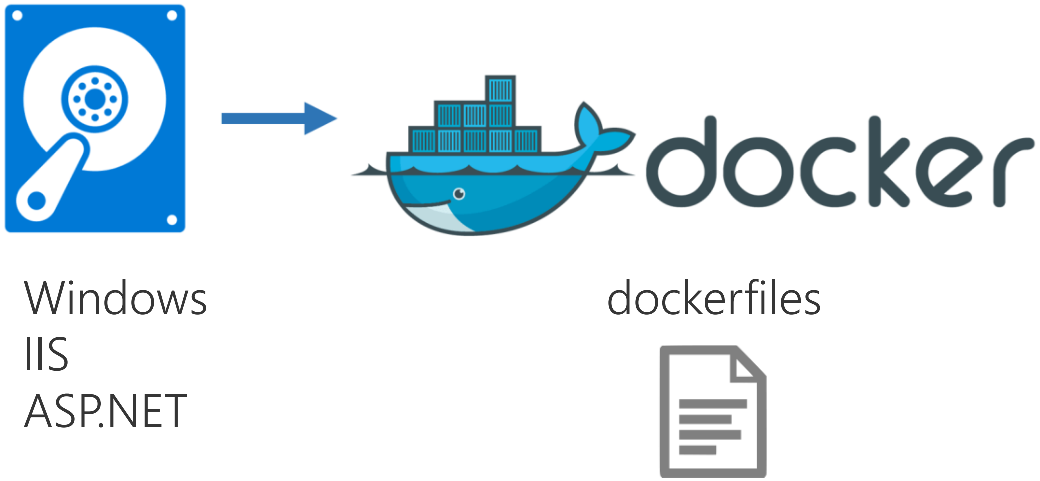
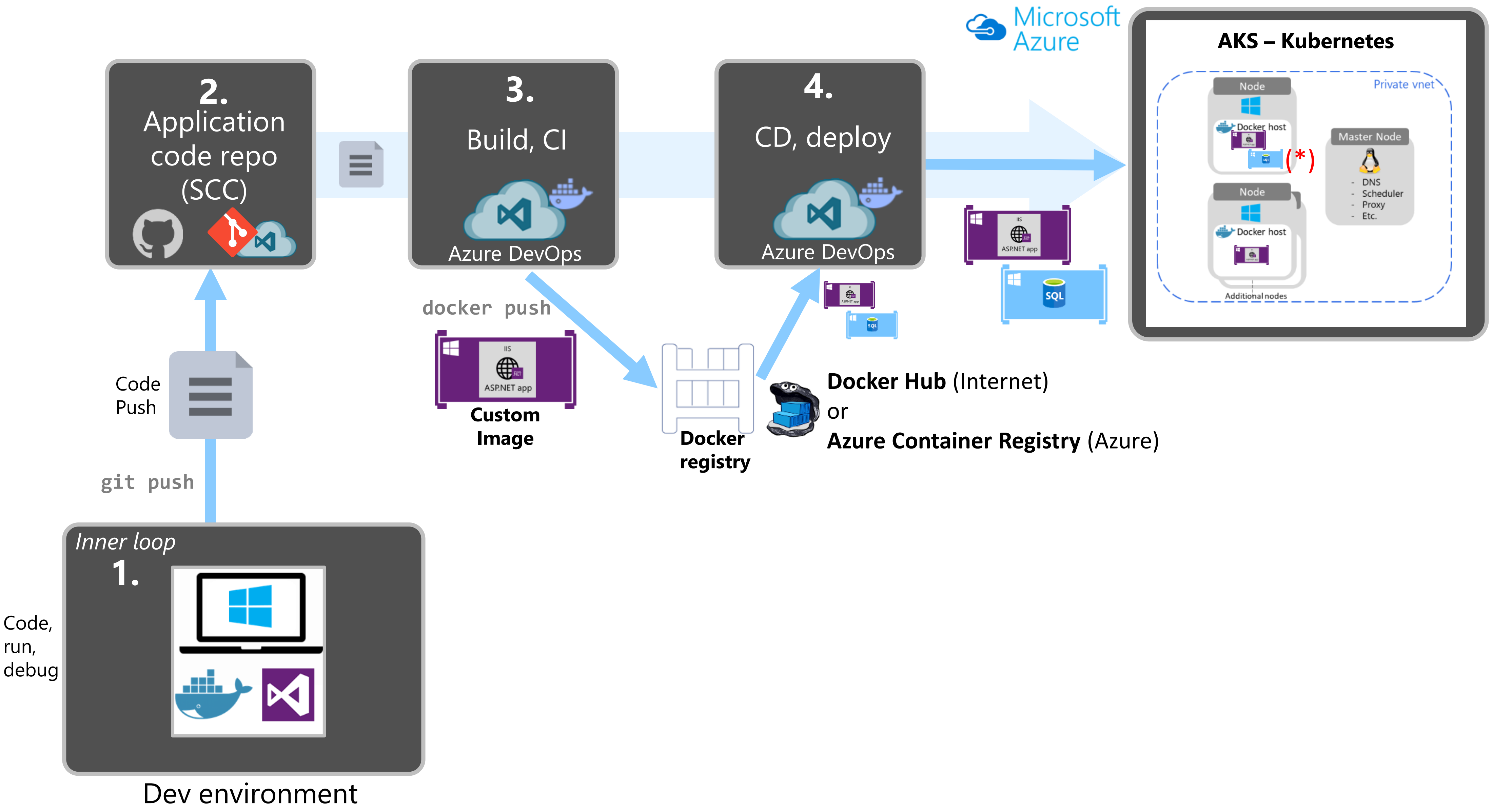


Image2Docker tool

- Ports existing Windows application workloads to Docker
- **IIS and ASP.NET apps**
    - Extract ASP.NET websites config/dependencies from a VM or server
- Generates **dockerfiles** for Windows Docker images, based on analysis of existing Windows machines.
- Open Source community tool, powered by Docker (the company)



Scenario: Deploy to Kubernetes through CI/CD pipelines



Inner loop

1\.

Code, run, debug

Dev environment

git push

Code Push

2. Application code repo (SCC)

3. Build, CI

Azure DevOps

docker push

Custom Image

Docker registry

4. CD, deploy

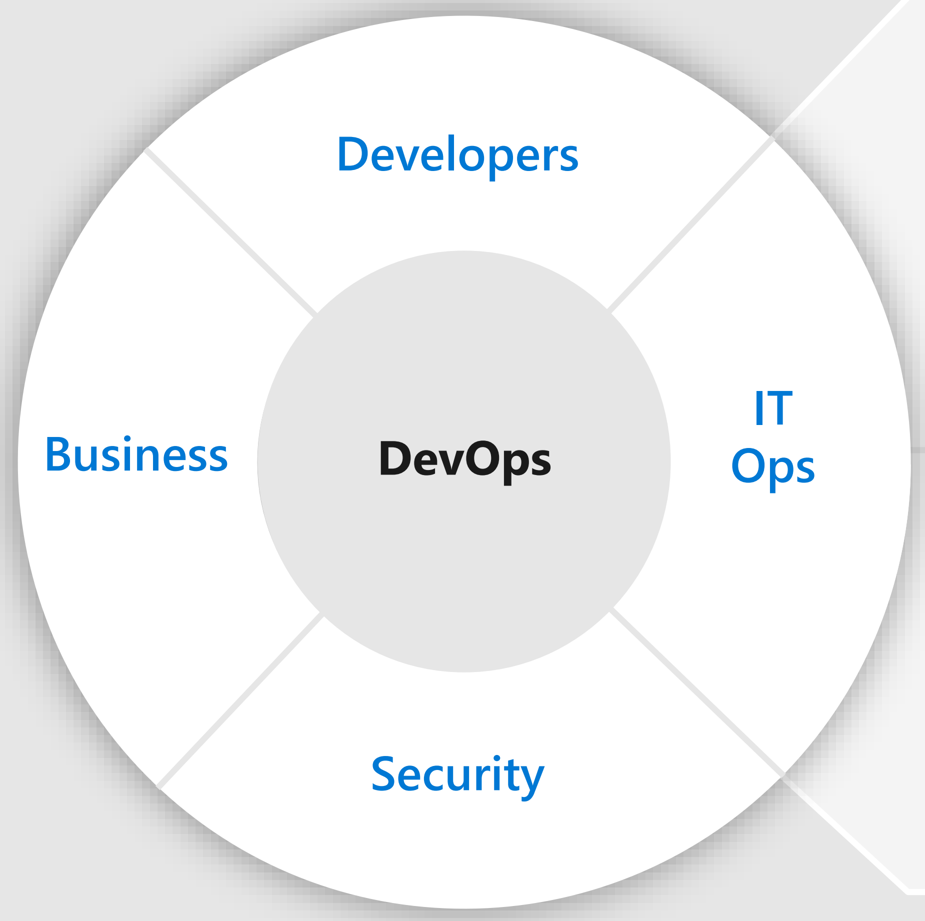
Azure DevOps

Docker Hub (Internet)
or
Azure Container Registry (Azure)

Microsoft Azure

AKS – Kubernetes

IT is transforming



Adopting new cloud technologies

- ARM
- Templates
- Scripting
- Functions
- Event Grid

Changing operating model

- Developer Collaboration
- Business value
- Time to market

2. CONS in Cloud DevOps ready

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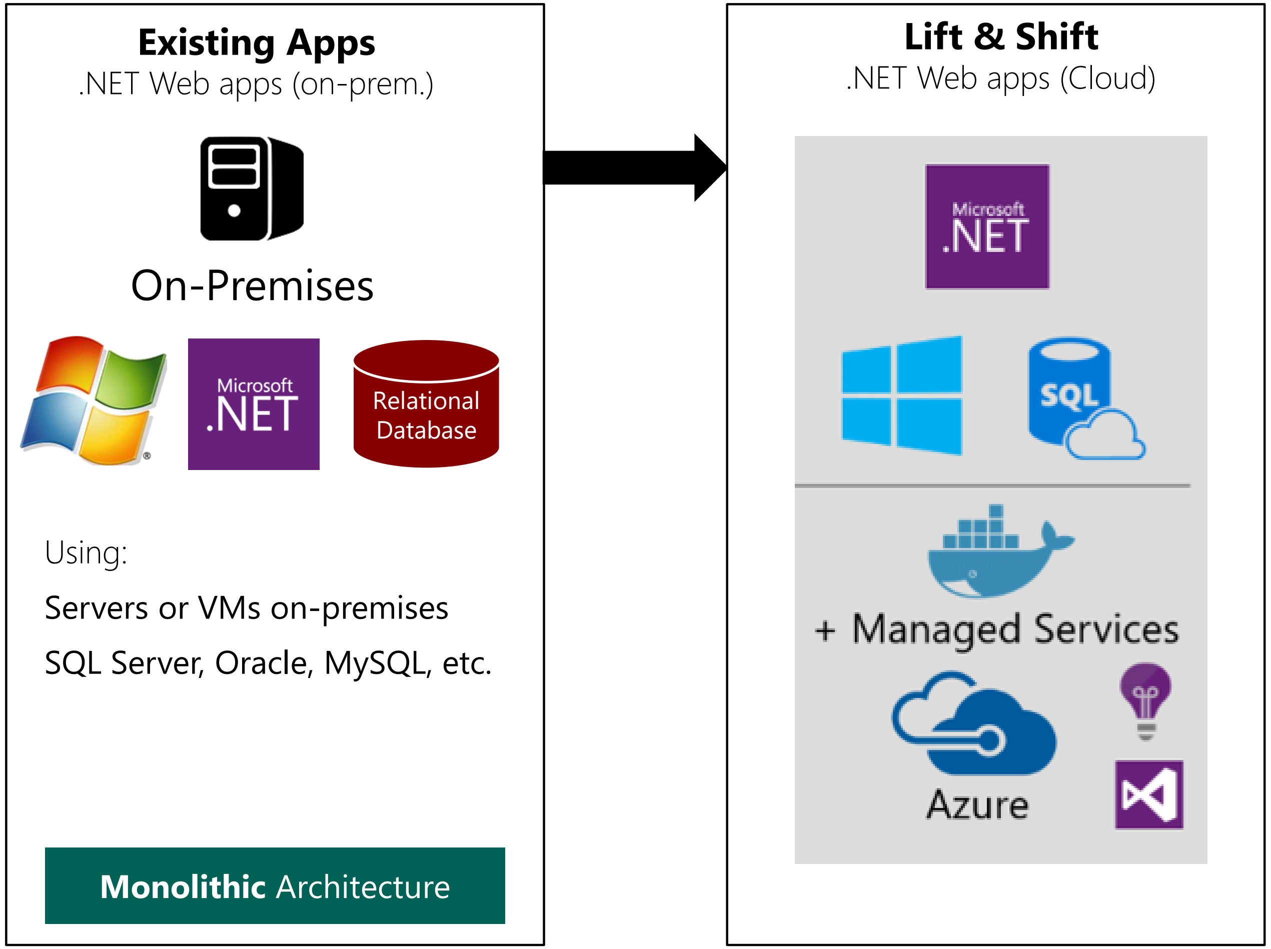
CONS

- × Containerization is an additional step in the learning curve



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Azure

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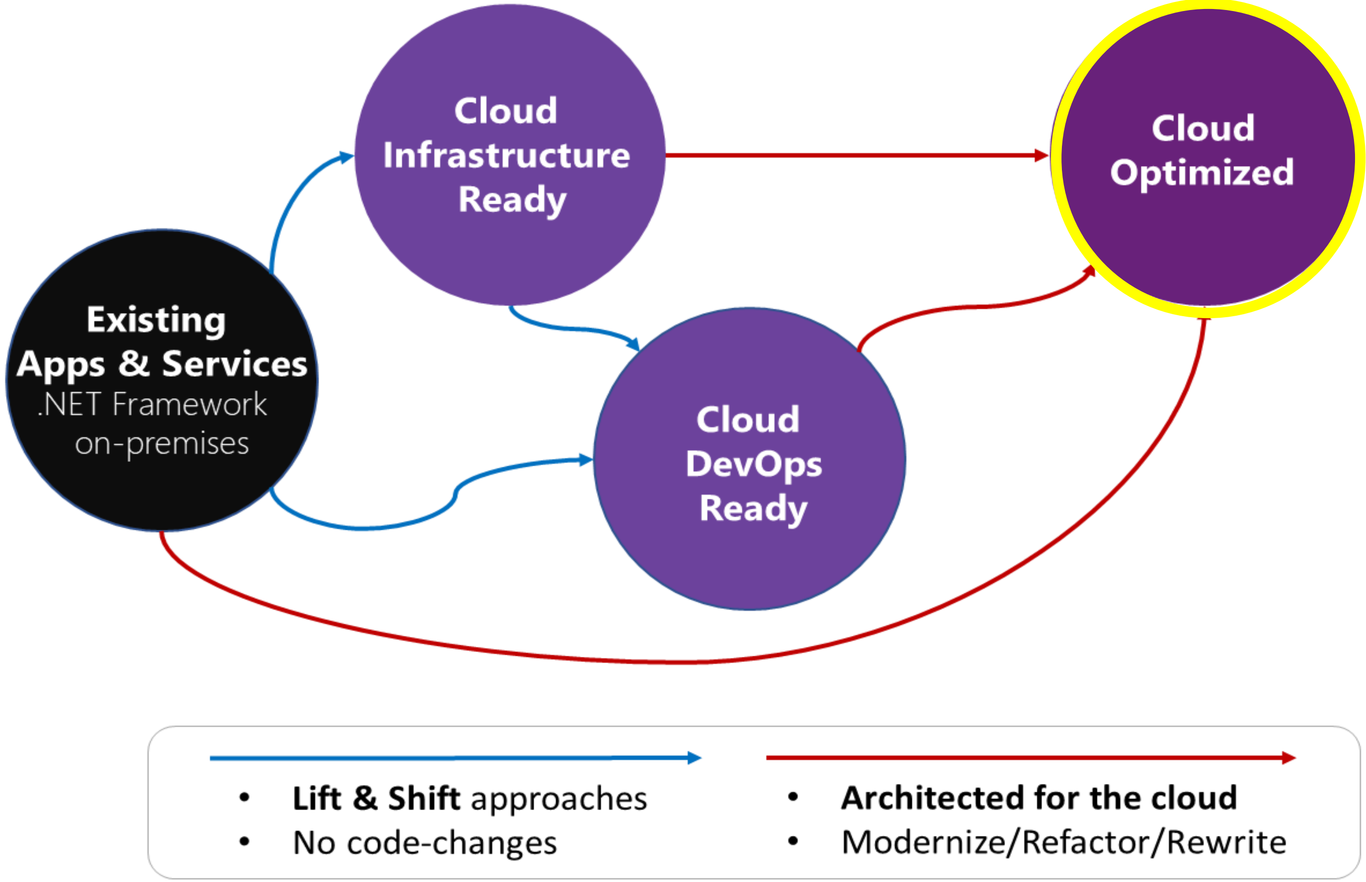

- **Lift & Shift** approaches
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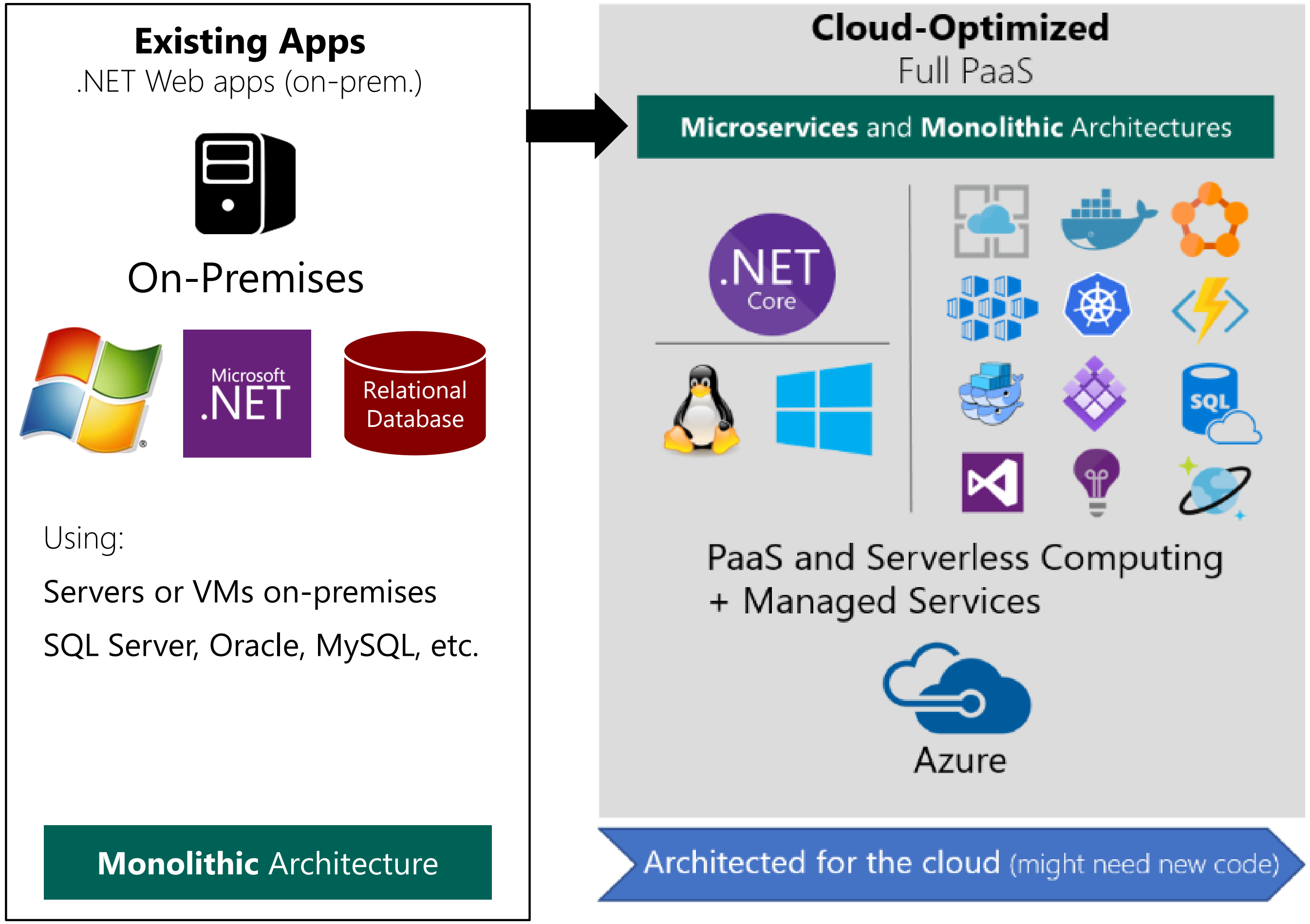
- **Architected for the cloud**
- Modernize/Refactor/Rewrite

3. Going to Cloud-Optimized (Full PaaS)

Extend your apps with new services based upon Server less computing, Microservices architecture and PaaS services (AppService) to fully exploit the advantages of the cloud.

PROS

- ✓ Optimized for long term agility



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Cloud-Optimized
Full PaaS

Microservices and **Monolithic** Architectures

PaaS and Serverless Computing
+ Managed Services

Azure

Architected for the cloud (might need new code)

Wrap-up

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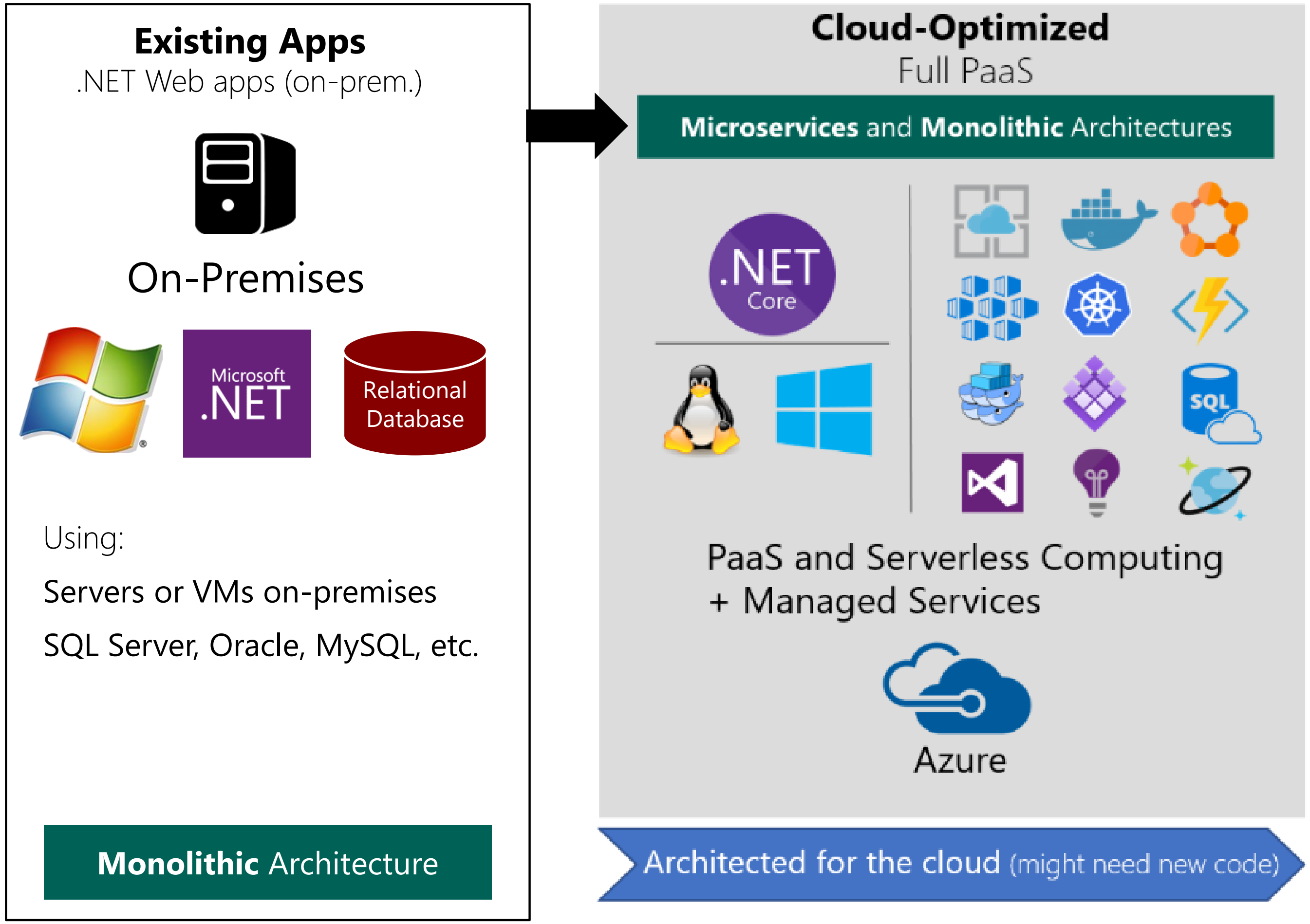
PROS

- ✓ Optimized for long term agility
- ✓ Optimized for scale and high availability
- ✓ Modern Architecture with Microservices and Cloud Native technologies



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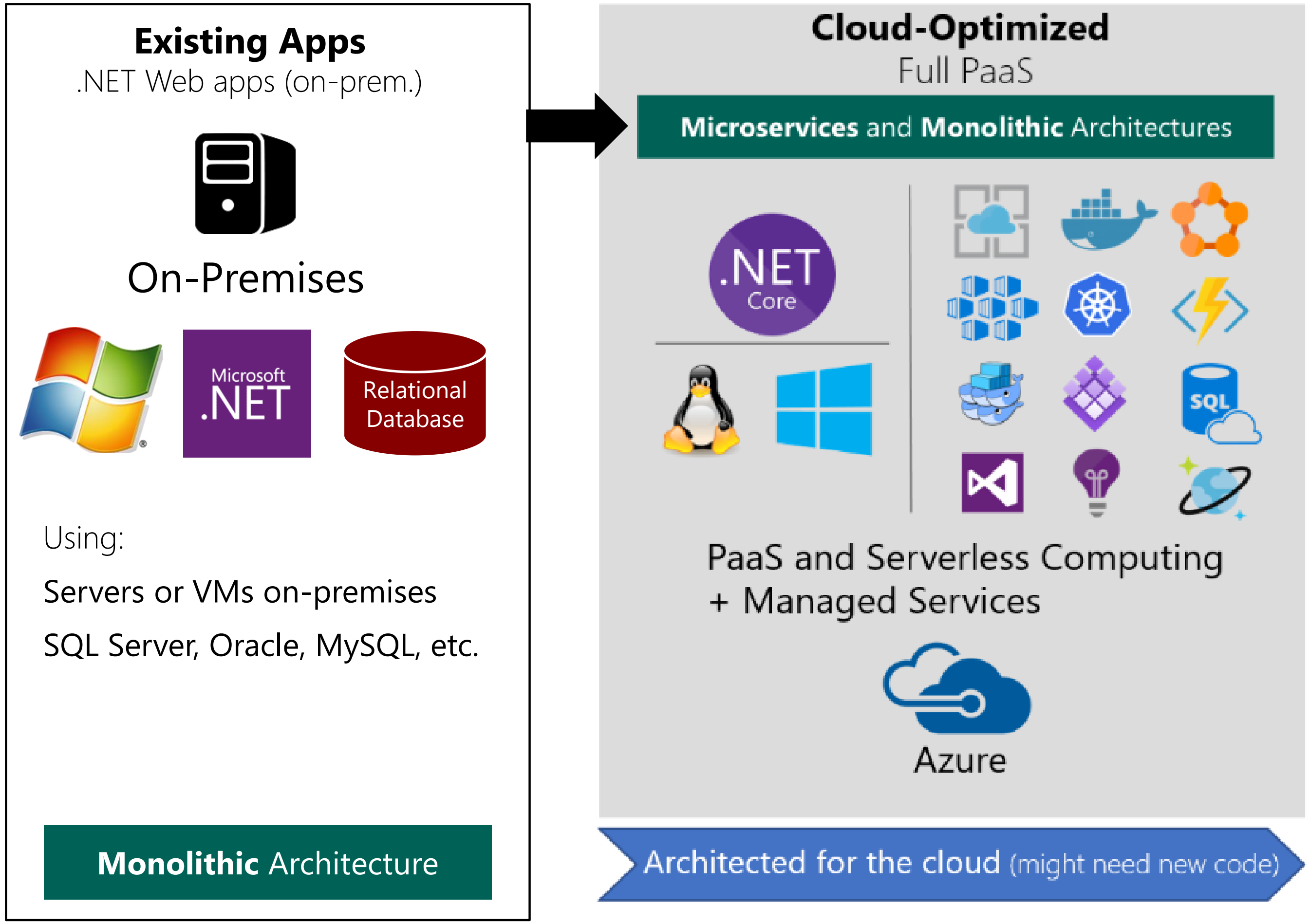
CONS

- × Requires significant code refactoring or rewriting (increased time and budget)



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Full PaaS

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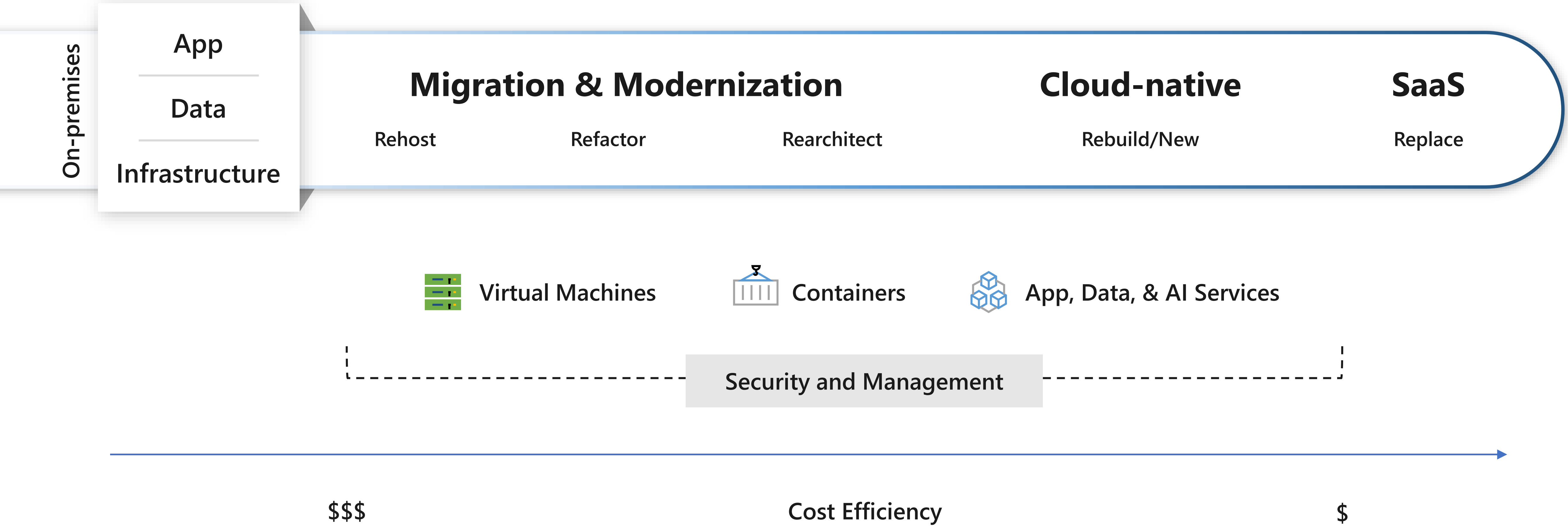
Architected for the cloud (might need new code)

Wrap-up

Customer cloud journey



On-premises

App

Data

Infrastructure

Migration & Modernization

Rehost

Refactor

Rearchitect

Cloud-native

Rebuild/New

SaaS

Replace

Virtual Machines

Containers

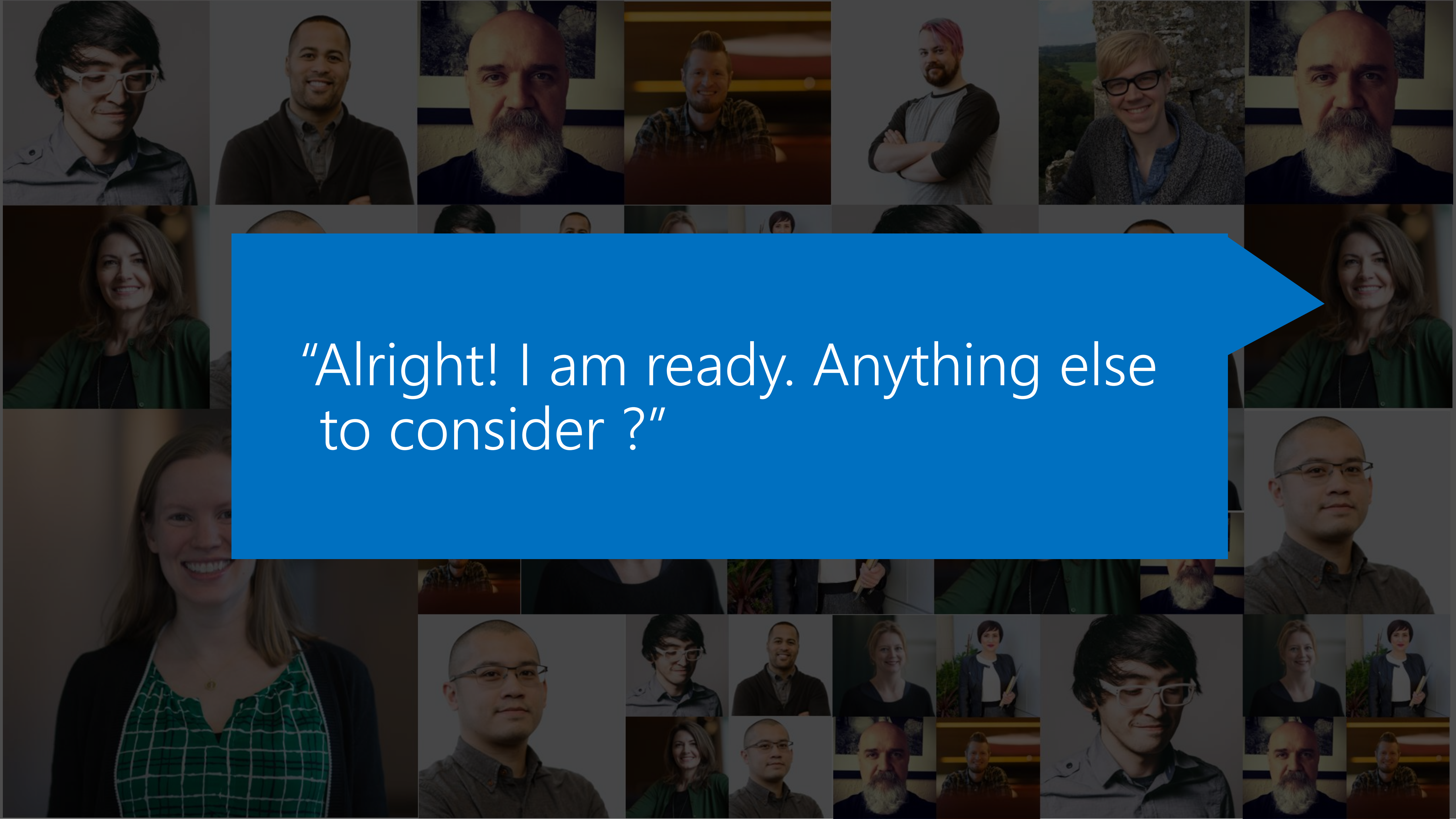
App, Data, & AI Services

Security and Management

$$$

Cost Efficiency

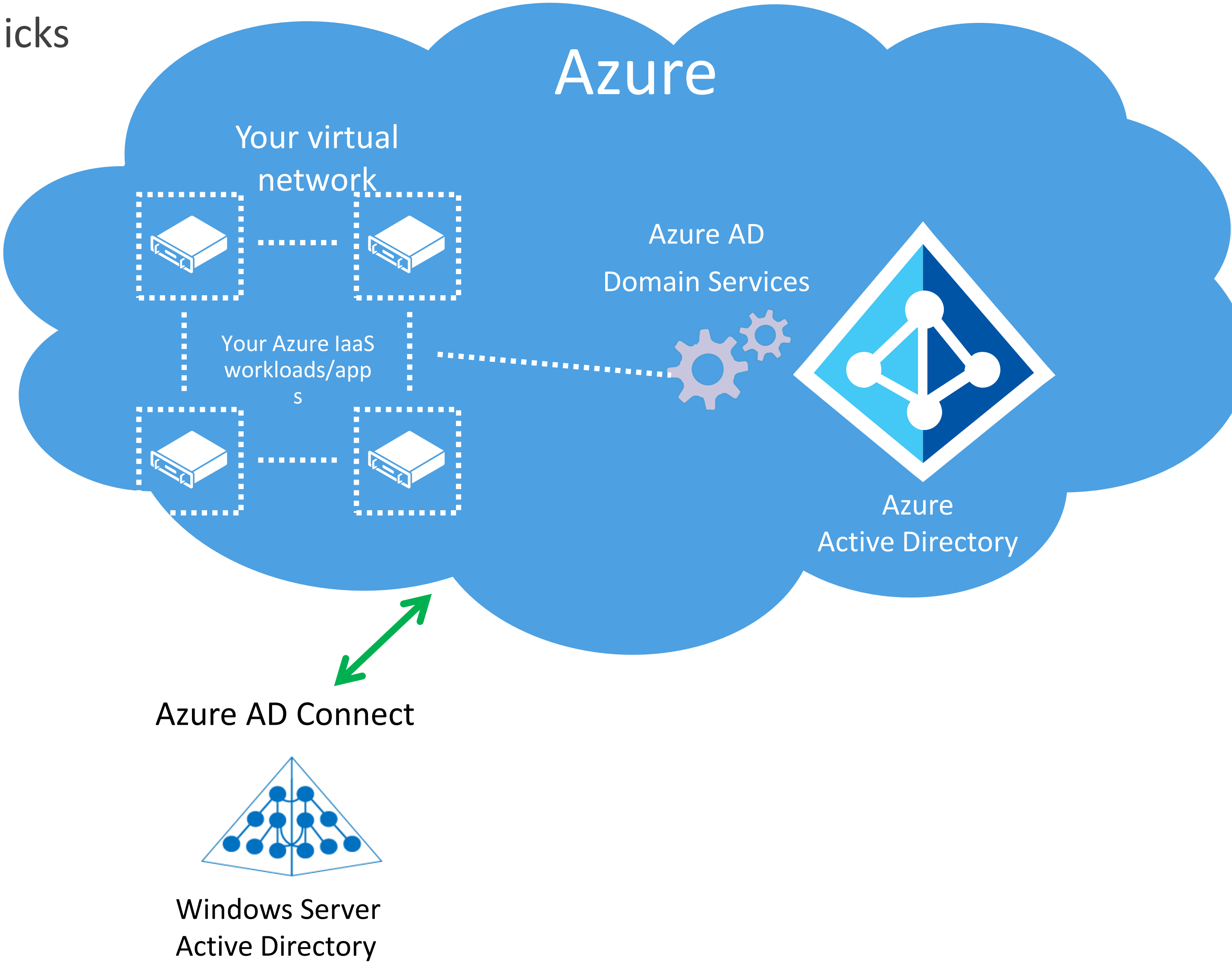
$



“Alright! I am ready. Anything else to consider ?”

Managing Identity

- Enable Azure AD Domain services in a few clicks
- Users, passwords and groups sync'd from Azure AD tenant
- Reflection of Azure AD



Don’t Build Everything - Networking

Load Balancer

Deliver high availability and network performance to your applications

Application Gateway/WAF

Build scalable and highly-available web front ends in Azure

DDoS Protection

Protect your Azure resources from DDoS attacks

VPN Gateway

Establish secure, cross-premise connectivity

Azure DNS

Host your DNS domain in Azure

Content Delivery Network

Ensure secure, reliable content delivery with broad global reach

Traffic Manager

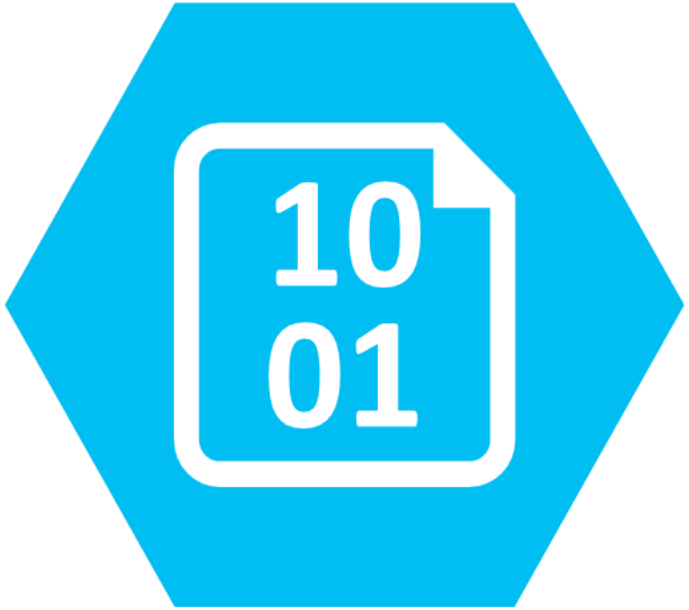
Route incoming traffic for high performance and availability

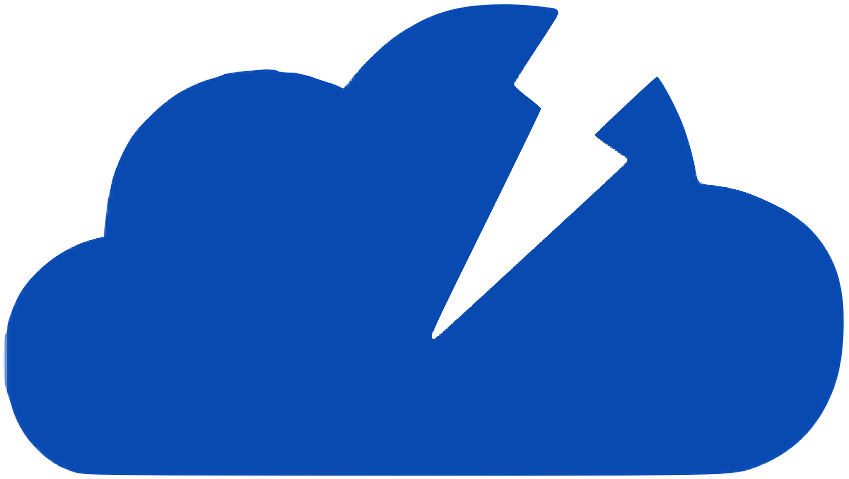
Network Watcher

Network performance monitoring and diagnostics solution

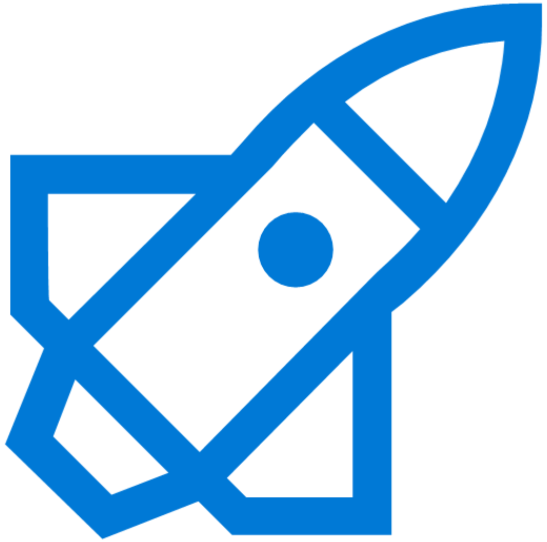
Label & Report

Do you need a web server?



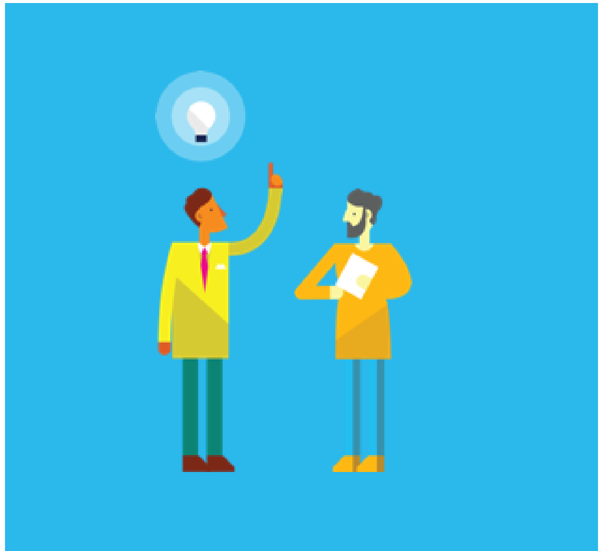


Do you need to build everything?



Add Business Value

DevOps



People

Process

Tools

Thanks!

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