Azure Compute Platform Overview

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Microsoft

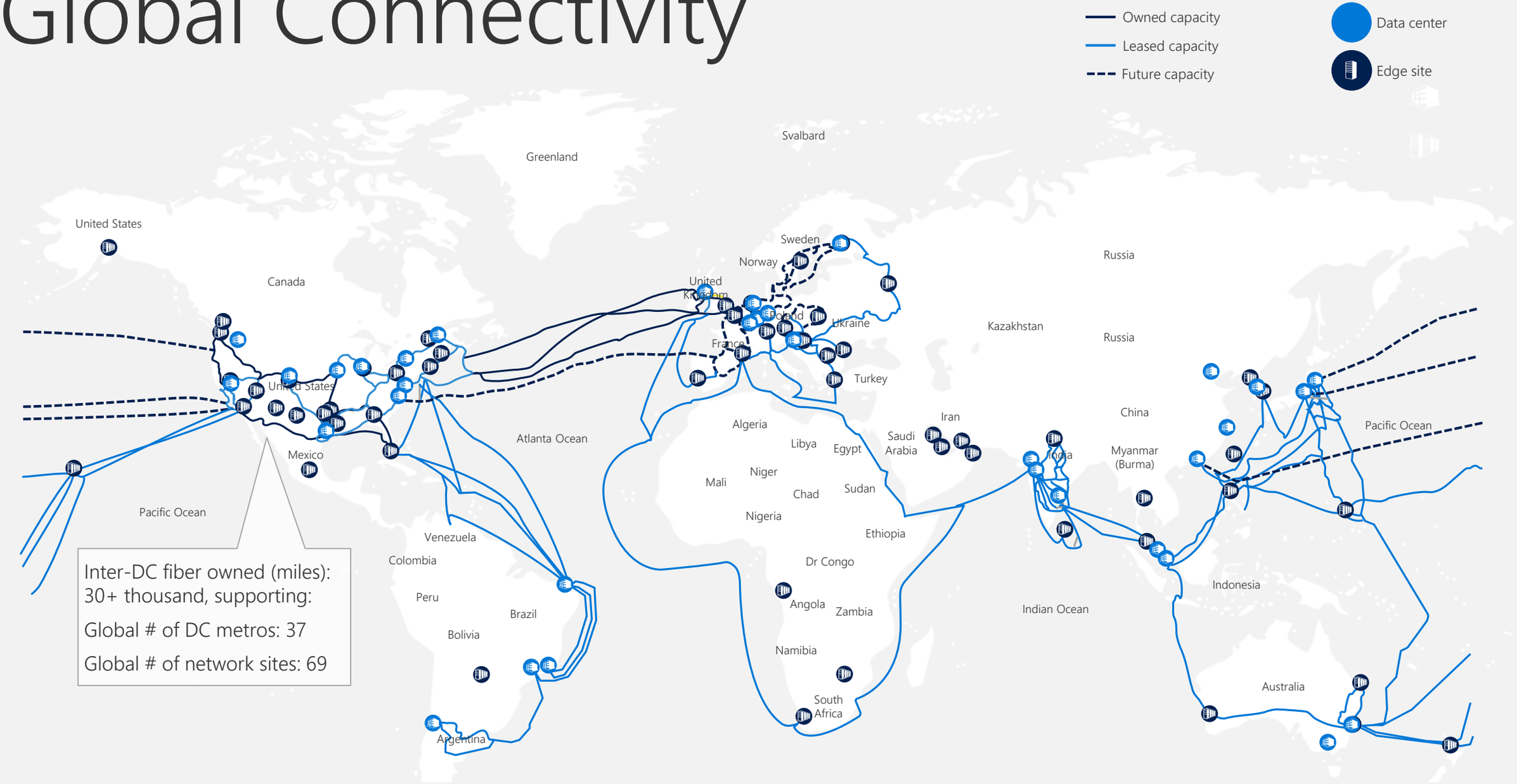
It's a great time to be software engineer

Never has so much computing been so accessible

50 Azure regions

Global Compute

Global Connectivity



*Datacenters and network sites not up to date

The changing world of app development

Mainframe
Monolithic
Client/Server
3 Tier
Component
RAD
Distributed
SOAP
SOA
Web
REST
Mobile
Microservices
Containers
Serverless

Physical Machines

Virtual Machines

Cloud Infrastructure

Born in the Cloud

1990 2000 2010 2016

Control vs Responsibility

On-Prem - Physical Machines

You own (and maintain) everything

IaaS - VMs

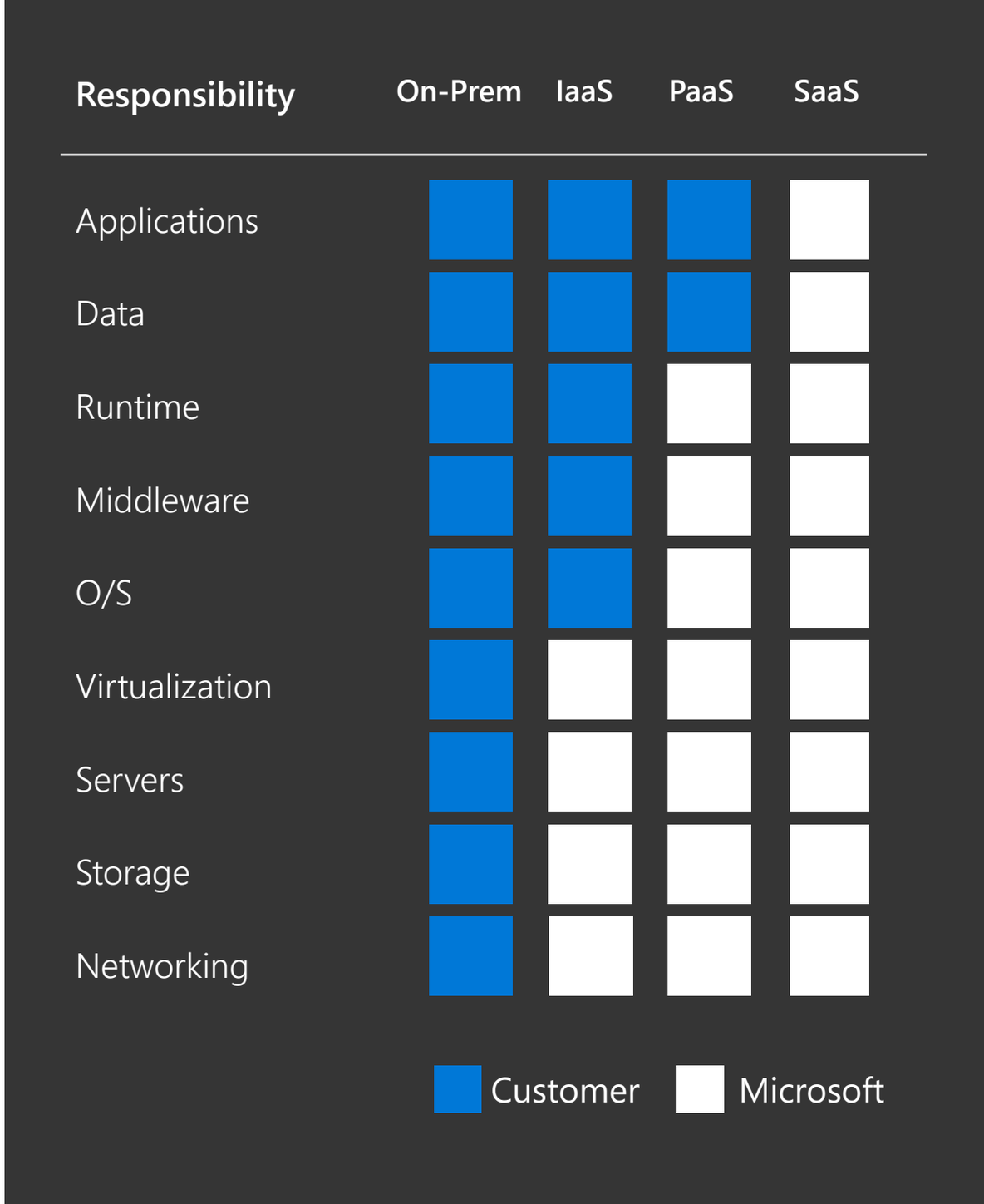
Basic building blocks to simulate physical machines

PaaS – App Service, Azure SQL, etc.

Supporting services provided, can focus on core business problem

SaaS – Office365

Use immediately (if it fits your needs)



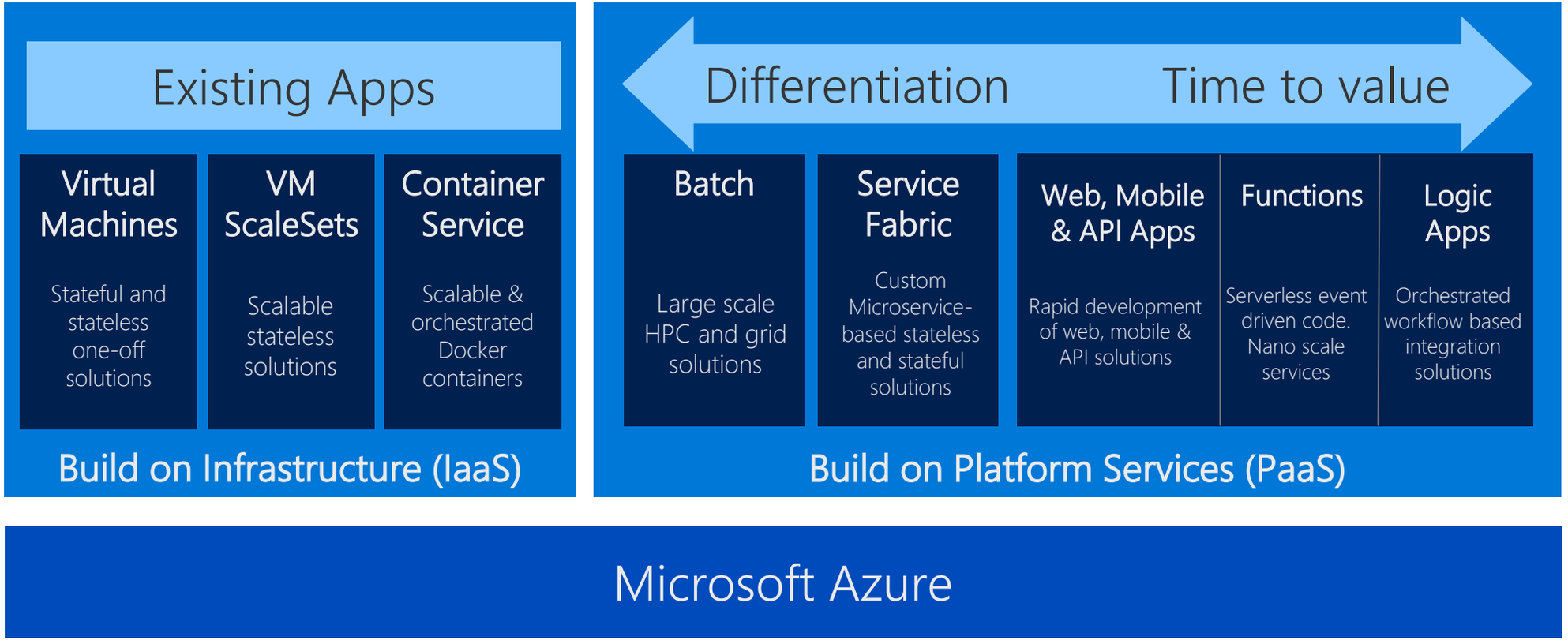
“Get Me The Laziest People Money Can Buy”

Jeff Atwood, Coding Horror

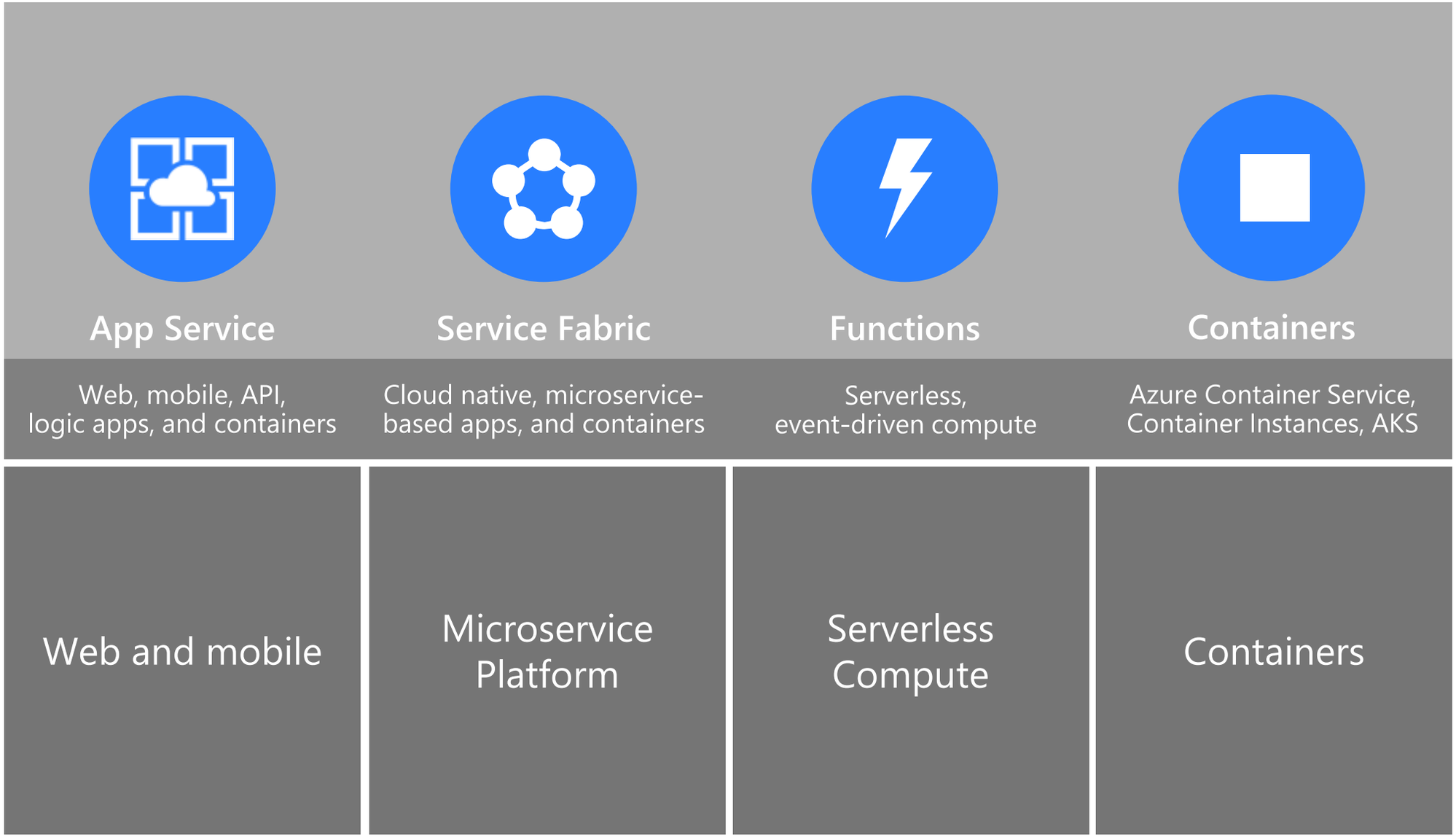
Less building & maintaining frameworks

More solving business problems

Azure IaaS & PaaS Spectrum



Azure Application Platform Services



Azure App Service

Enterprise-grade apps

Global data center footprint

Hybrid support

AAD integrated

Secure + compliant

Fully managed platform

Built-in auto scale and load balancing

High availability with auto-patching

Reduced operations costs

Backup and recovery

High productivity development

.NET, Java, Ruby, PHP, Node, Python and containers on Linux and Windows

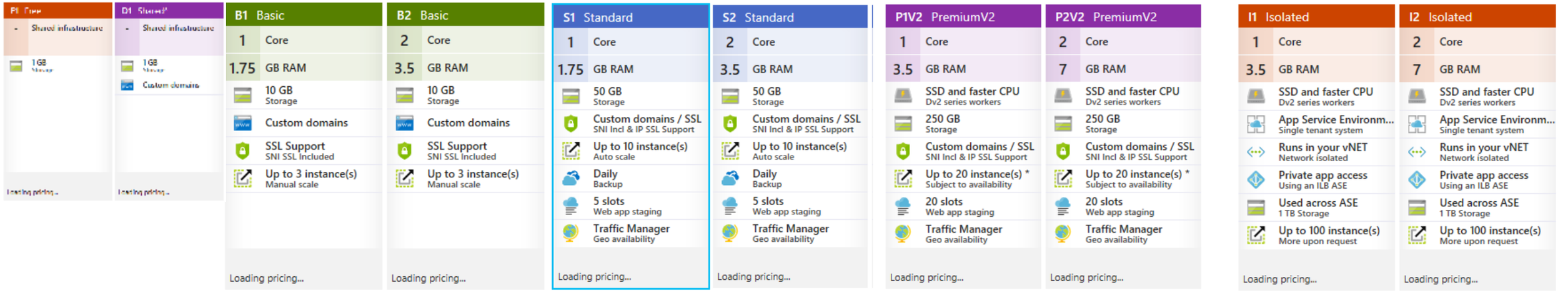
Staging and deployment

Monitoring and debugging in production

App gallery marketplace (WordPress, Umbraco, Joomla!, Drupal, etc.)

App Service Plan

The underlying compute – pick your region, scale, and features*



- Shared Infr.
- Basic features
- Free unless need custom domain

- SSL
- Multiple Instances (up to 3)
- Manual Scaling

- Multiple Instances (up to 10)
- Auto Scaling
- Deployment Slots (up to 5)

- Multiple Instances (up to 20)
- Deployment Slots (up to 20)
- Traffic Manager
- Faster compute available (SSD and faster CPU)

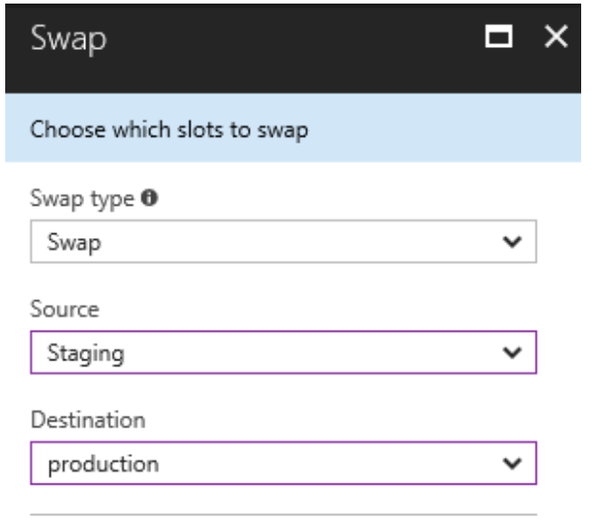
- Network Isolation
- Faster compute (SSD and faster CPU)

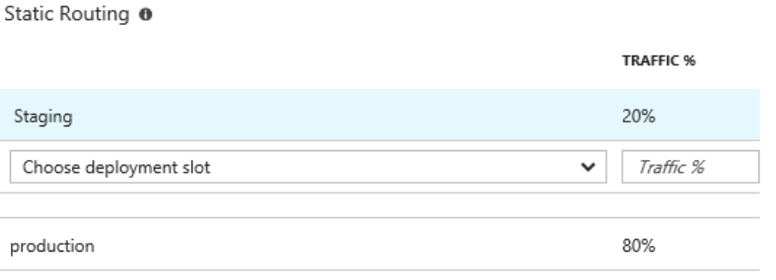
*All apps in a service plan share the underlying resources – **you pay for the plan, not the number of apps hosted on it. Plans with no apps still incur charges.**

Demo – Simple Web App

Deployment Slots

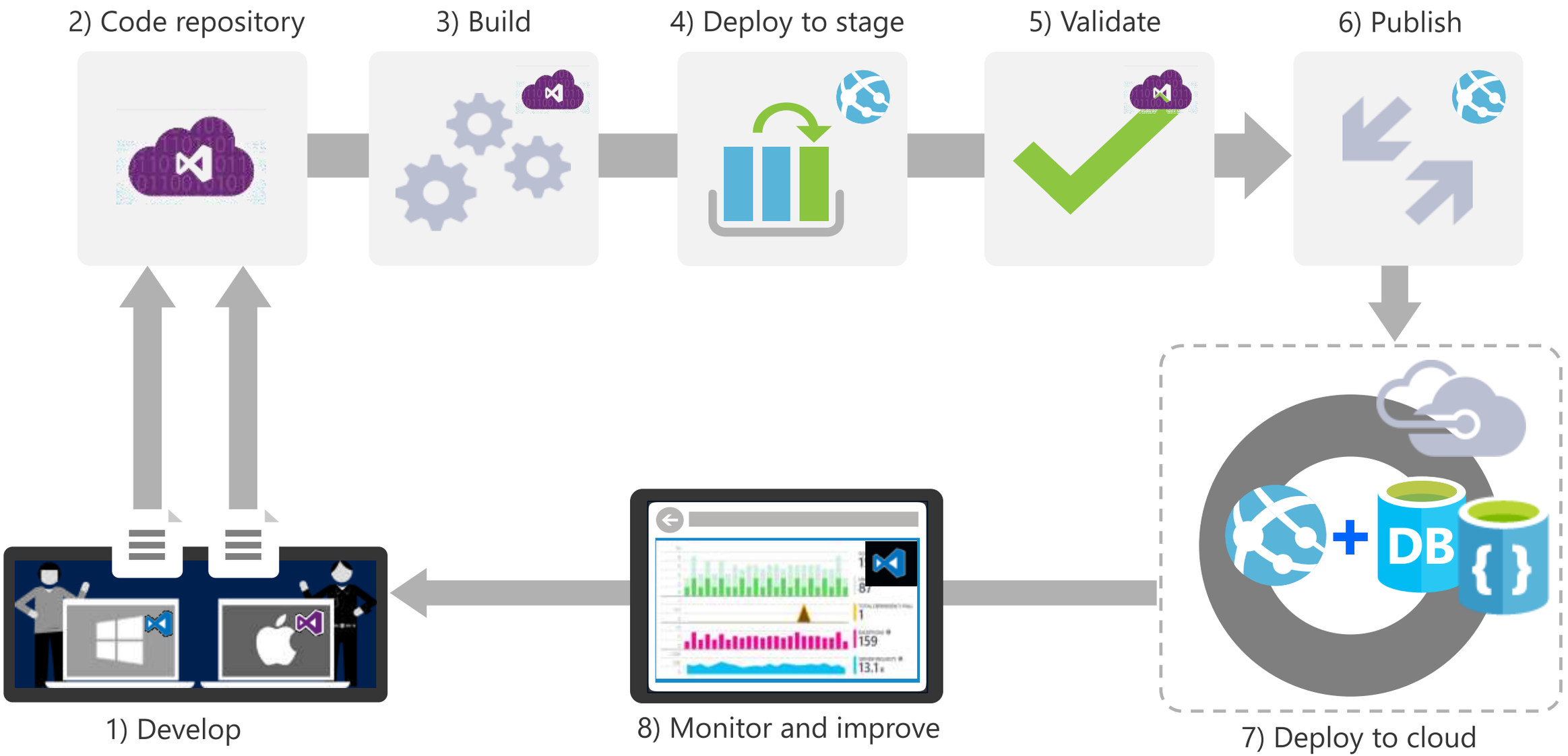
- Deploy different versions of your app to different URLs (prod, stage, dev, etc.)
- Can test and only swap when ready
- Each slot is a separate Web App and can have it's own configurations
- Can A/B-test deployment before swap (AKA Testing in Production)





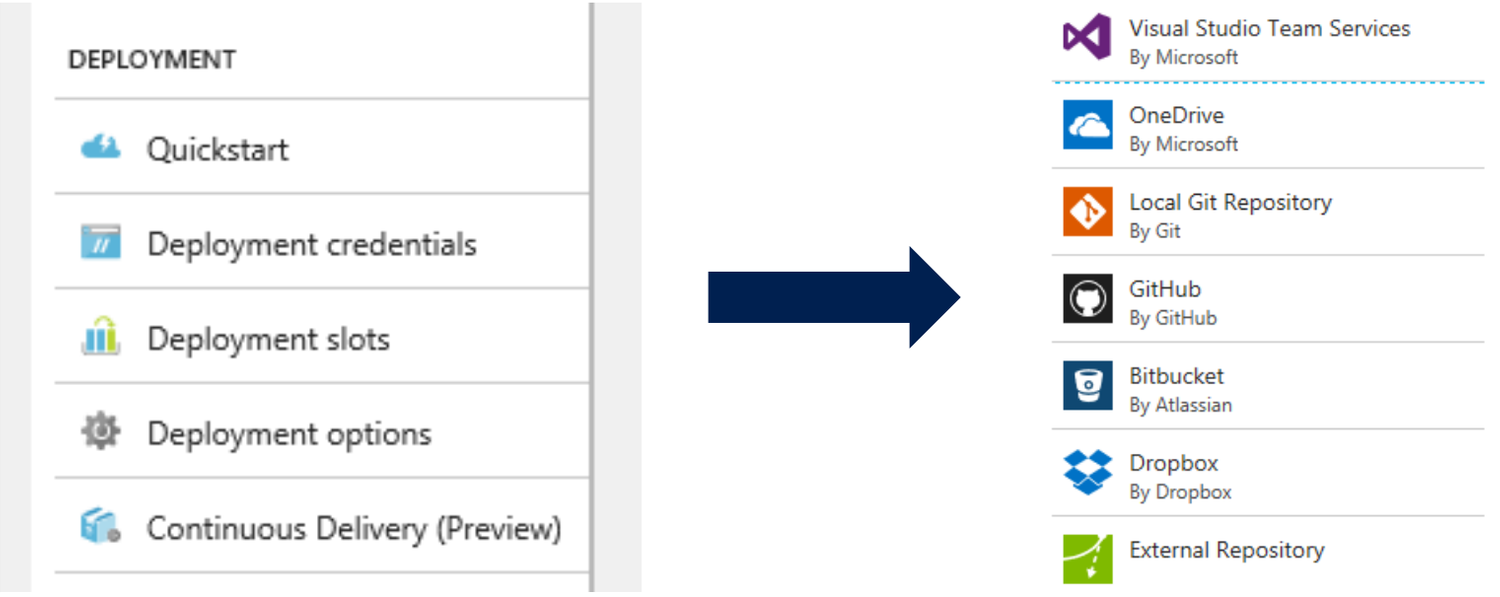
Demo – Deployment Slots

Deployment Process



Deployment Options

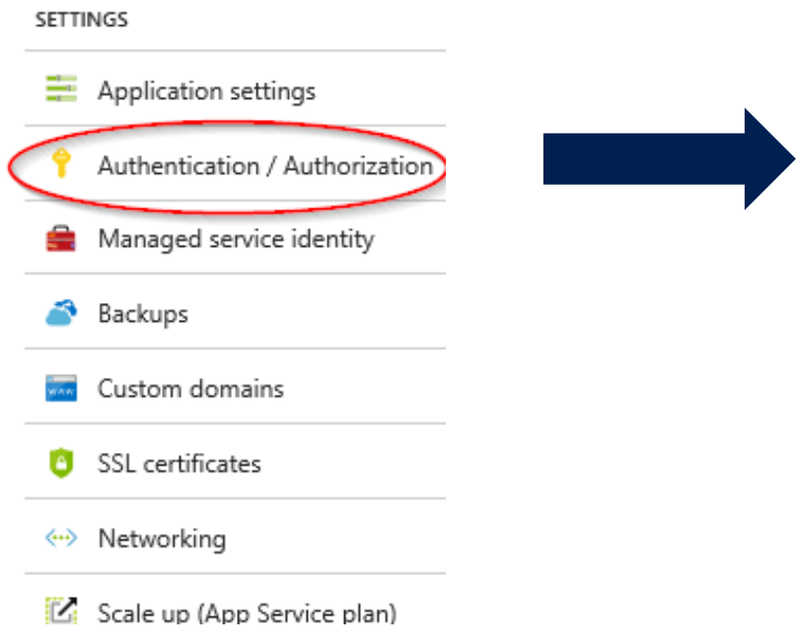
- Visual Studio Team Services, Jenkins, Octopus, etc.
- FTP/WebDeploy for other methods
- Container-based deployment (Linux Web Apps)

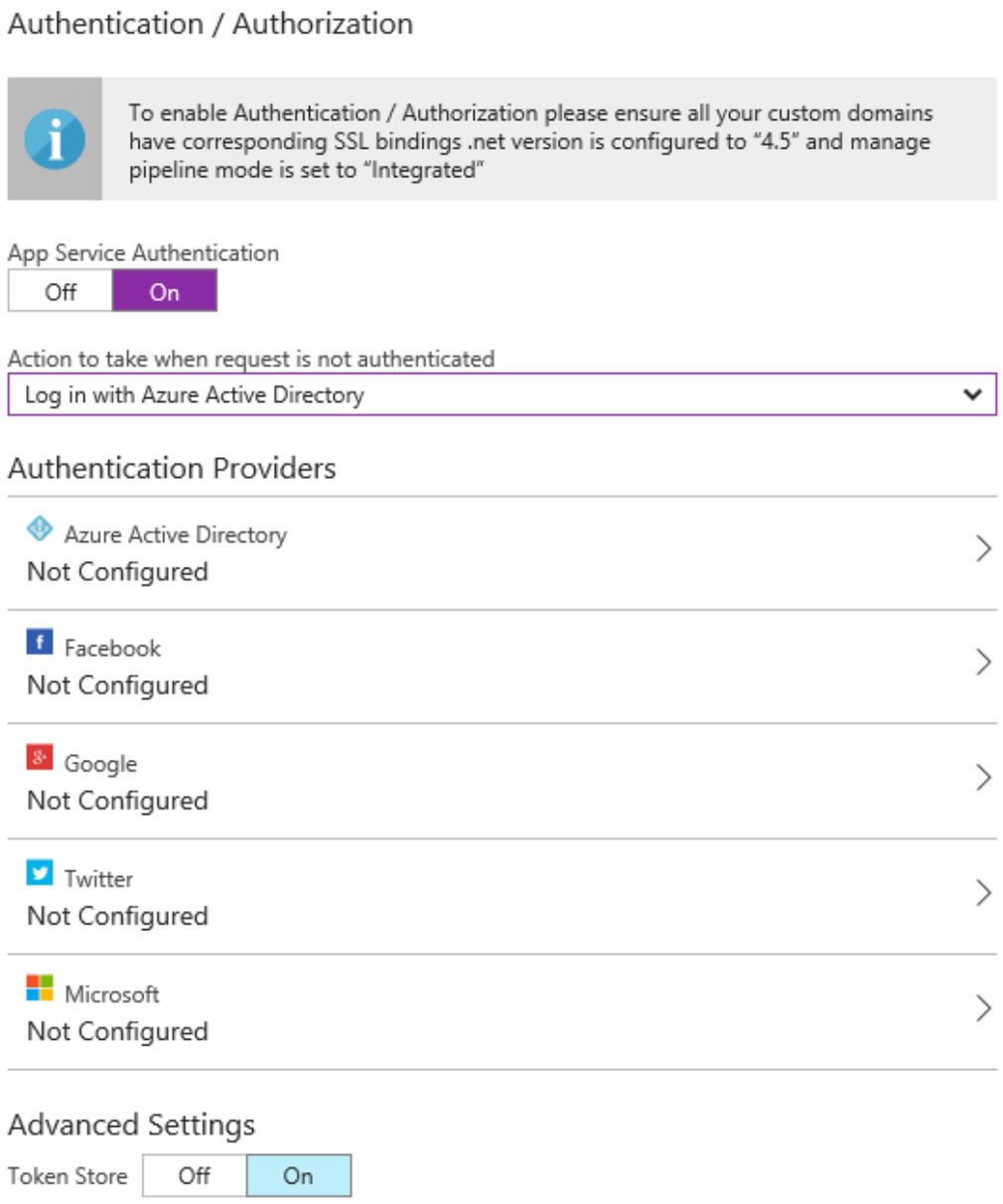


Demo – Web App CI

Authentication

- Can use Azure Active Directory, or other SSO provider
- With AAD, need to create an Application in tenant

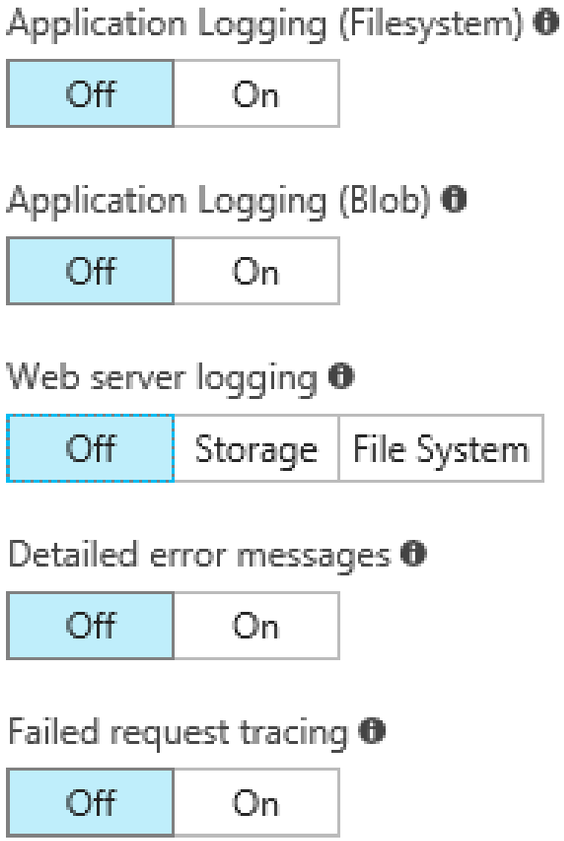




Demo – Web App Auth

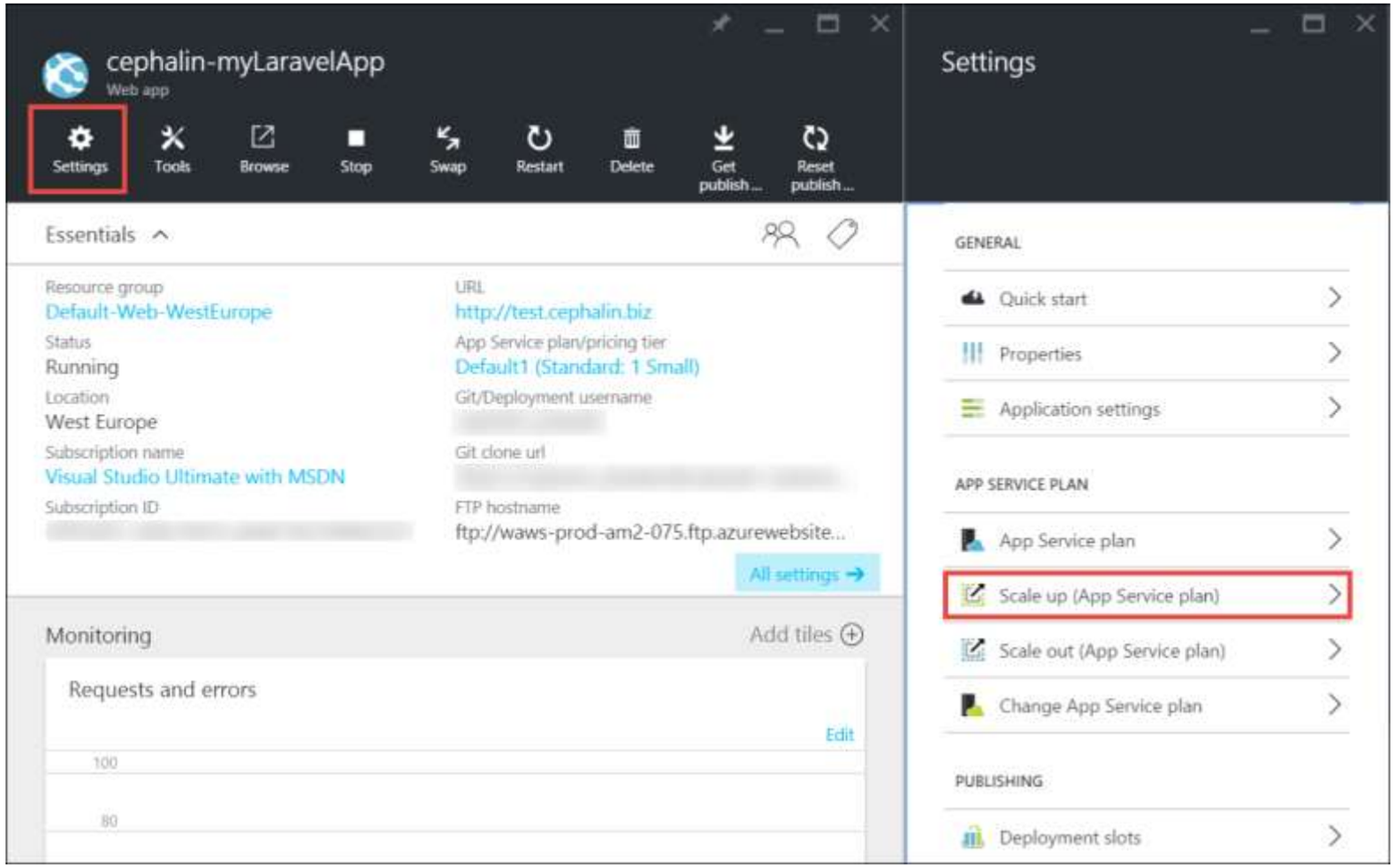
Logging and Monitoring

- Live log stream
- Alerts on Metrics or Events
- Kudu
- Application Insights



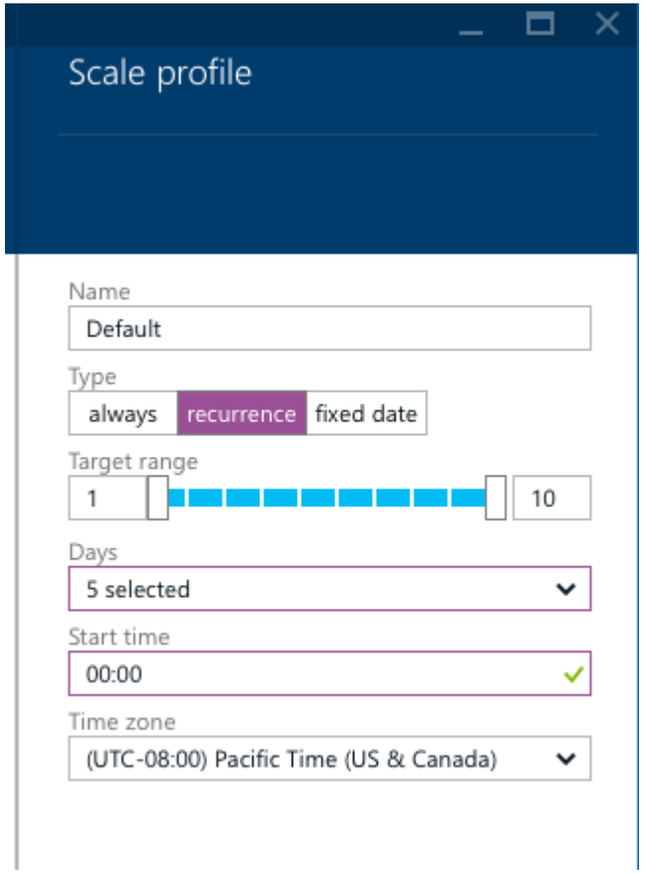
Scaling Up

- Manual
  - Usually infrequent
- Pick new pricing tier
  - Features
  - Memory/CPU



Scaling Out

- Based on metric
  - CPU
  - Memory
- Scheduled
  - Specific Date
  - Recurring
- Manual



Demo – Kudo, Logging and Alerts, Scaling

App Service Hosting Offerings

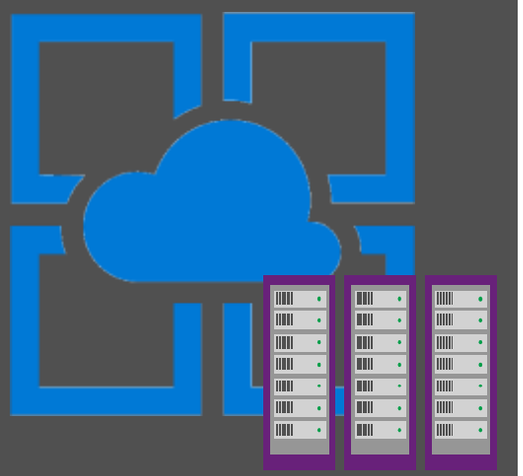
Multitenant
Free, Basic, Standard, Premium

We provide the infrastructure, you provide your application code.

Isolated
App Service Environment

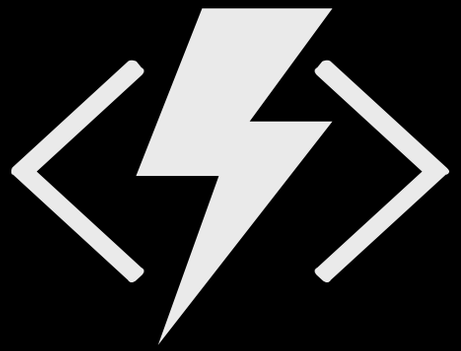
Your own dedicated environment with network isolation for apps, higher scale, and the ability to connect securely to local vNets.

On Premise
Azure Stack



Leverage cloud innovations in on-premises infrastructure. App Service on Azure Stack brings the power of Azure App Service to your own data centers

On Demand
Azure Functions on App Service



Run your Azure Functions on your App Service plan or pay per execution.

App Service Environment

Dedicated and isolated infrastructure

- Dedicated front-end and back-end instances (thus, more expensive)
- Isolation within own virtual network

Achieve higher scale

- Scale to 50 instances (more available upon request)
- Front-end load balancers with scale-out
- Extra Large workers

More security

- VPN Site-to-Site and ExpressRoute connections
- Control incoming traffic with Network Security Group
- Protect apps with web app firewall, appliances and network SaaS providers

Other App Service features

- Web Jobs (scheduled, continuous, manual)
- Scheduled Backups
- Secure Access to Vnets
- IP Restrictions
- Load Testing

Azure functions

Process events with Serverless code

Trigger on events & external services / feeds

Pay only per execution with instant scale or via App Service

Choice of languages

Open source runtime runs anywhere

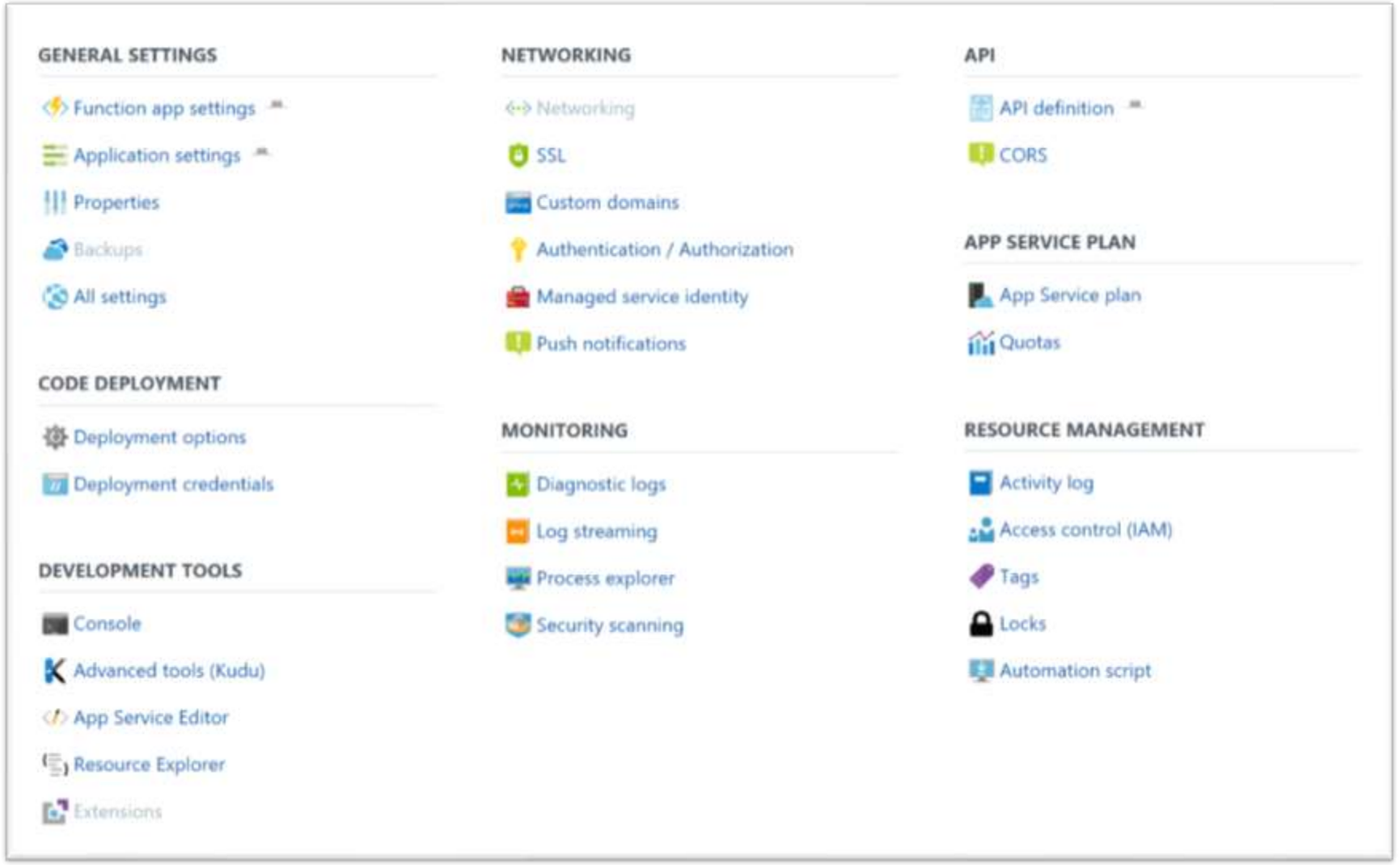
Benefits of Serverless

Manage apps, not servers

Reduced DevOps

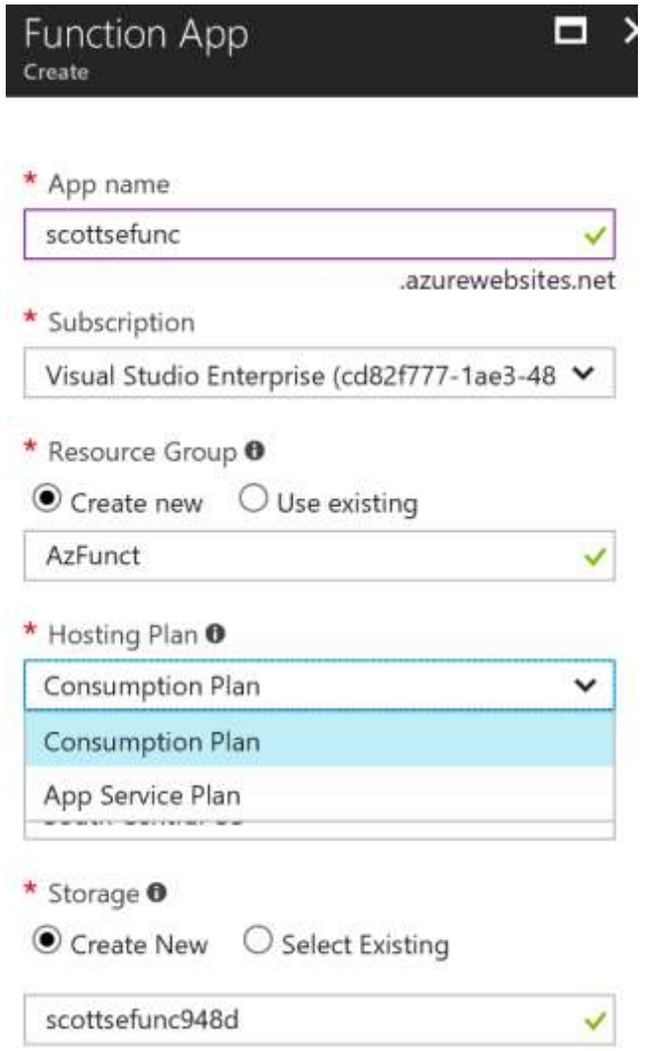
Faster time to market

Functions are based on App Service



Hosting Choices

- Consumption Plan
  - Pay per execution – dynamic resource allocation
  - No cost limit
  - Associated Storage Account
- App Service Plan
  - Create app service plan similar to App Service
  - Controls costs and scale
  - Ability to run in isolated

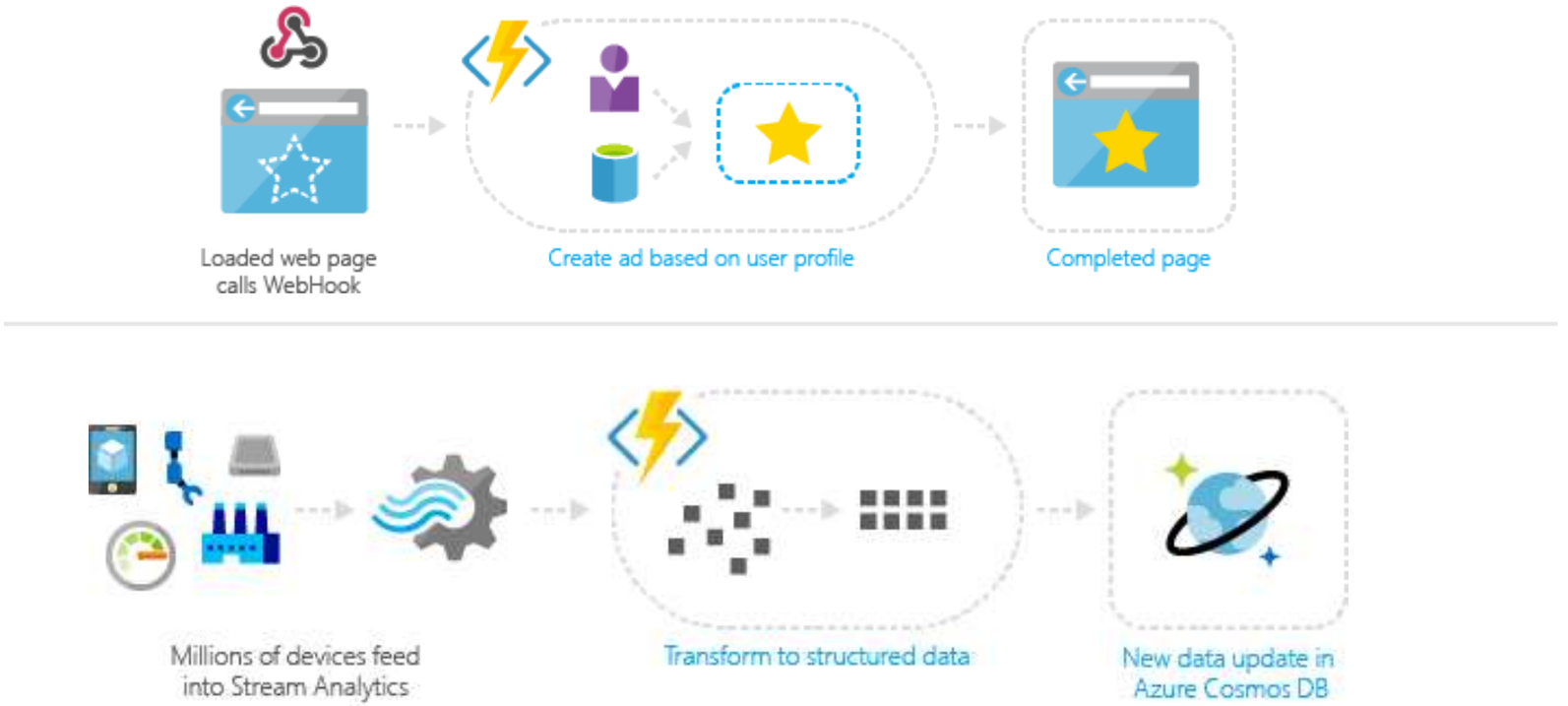


Triggers and Bindings

Trigger + Input ➡ Output

Type	Trigger	Input	Output
Blob Storage	✓	✓	✓
Cosmos DB	✓	✓	✓
Event Grid	✓		
Event Hubs	✓		✓
Notification Hubs			✓
Queue storage	✓		✓
SendGrid			✓
Service Bus	✓		✓
Table storage		✓	✓
Timer	✓		
Twilio			✓
Webhooks	✓		✓

Example Applications



Functions Programming Model—Best Practices

- **Functions should “do one thing”**
- **Functions should finish as quickly as possible**
- **Functions should be stateless**
- **Functions should be idempotent**

Demo – Function

Azure Service Fabric

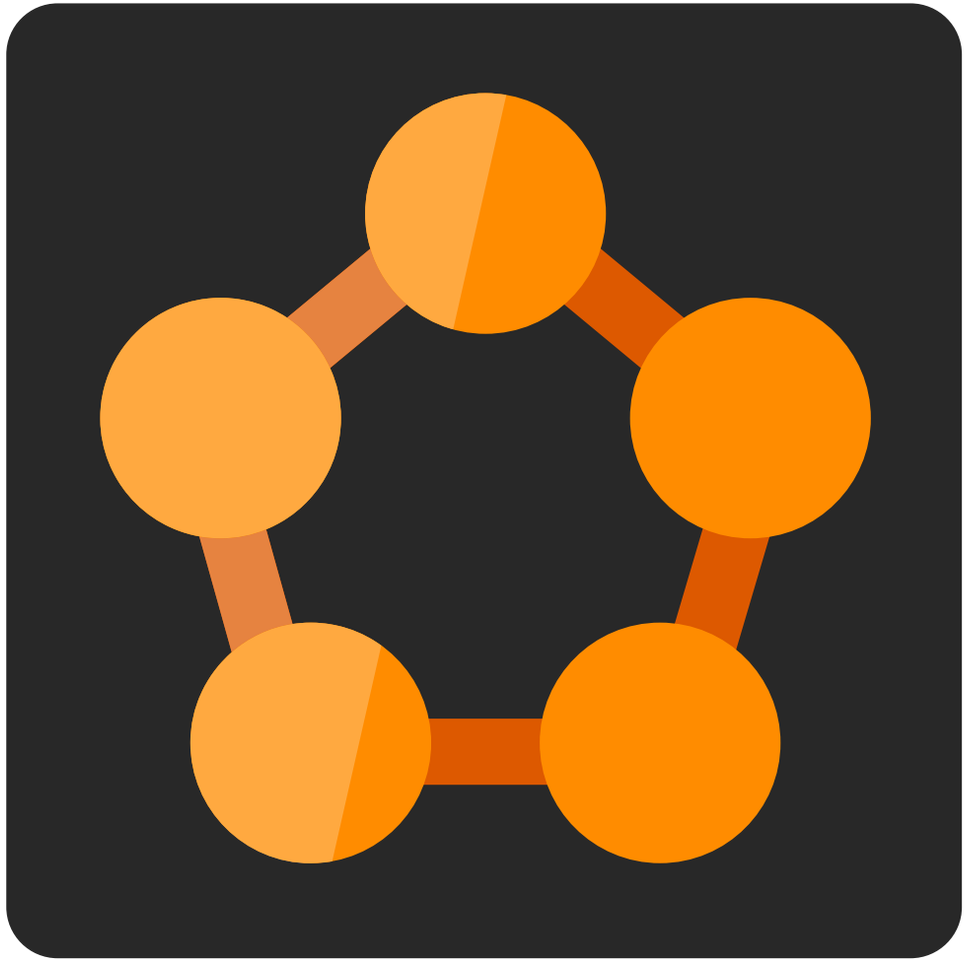
Microservice platform

Stateful and stateless framework features

.NET and Java API's on Windows Server and Linux

Container Hosting and Orchestration

Deploy on Azure, Azure Stack, On-Prem, VMware, OpenStack, AWS



Rolling Upgrades

Availability Guarantees

Scale Out Architecture

Resource Governance

Density

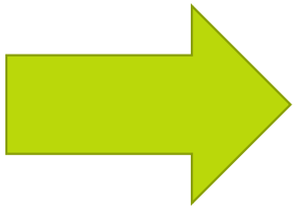
Packaging & Deployment

Policy Enforcement

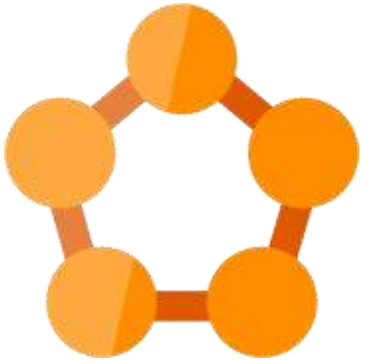
Granular Versioning

Stateful Workloads

Leader Election



Service Fabric



Azure's Microservices platform

Services Powered by **Service Fabric**

SQL Database

2.1 million DBs

Cosmos DB

Billions transactions/day

IoT Hub

Millions of messages

Event Hubs

60bn events/day

30% of Azure cores run Service Fabric

Skype

Cortana

Intune

Dynamics

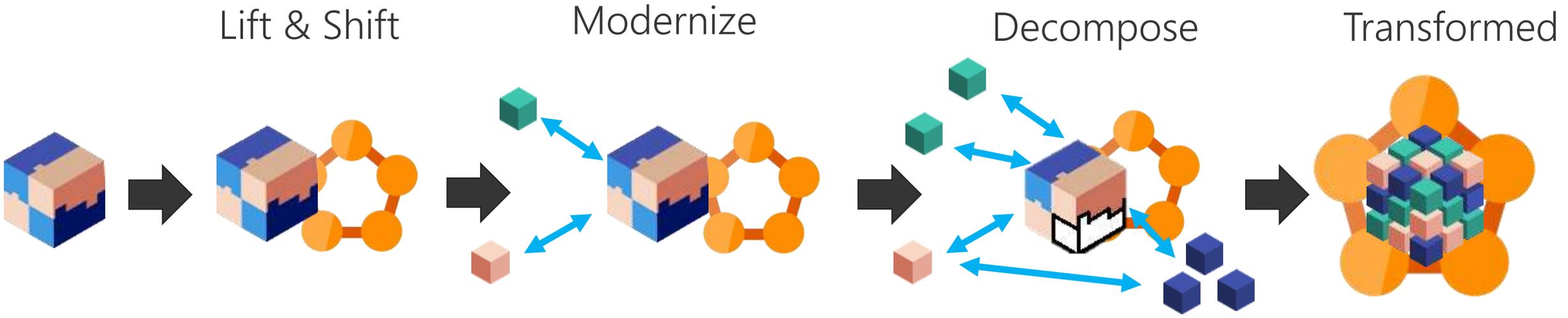
Power BI

Designed for mission critical tier 1 workloads

Stateful Services Framework Elements

- Reliable Collections
  - Stateful services store their state in Reliable Collections (such as a dictionary or a queue).
- Reliable Actors
  - An API to build stateless and stateful objects through the virtual Actor programming model.
- Guest Executables
  - Any Code
- Containers
  - Windows
  - Docker

Modernize Applications with Service Fabric



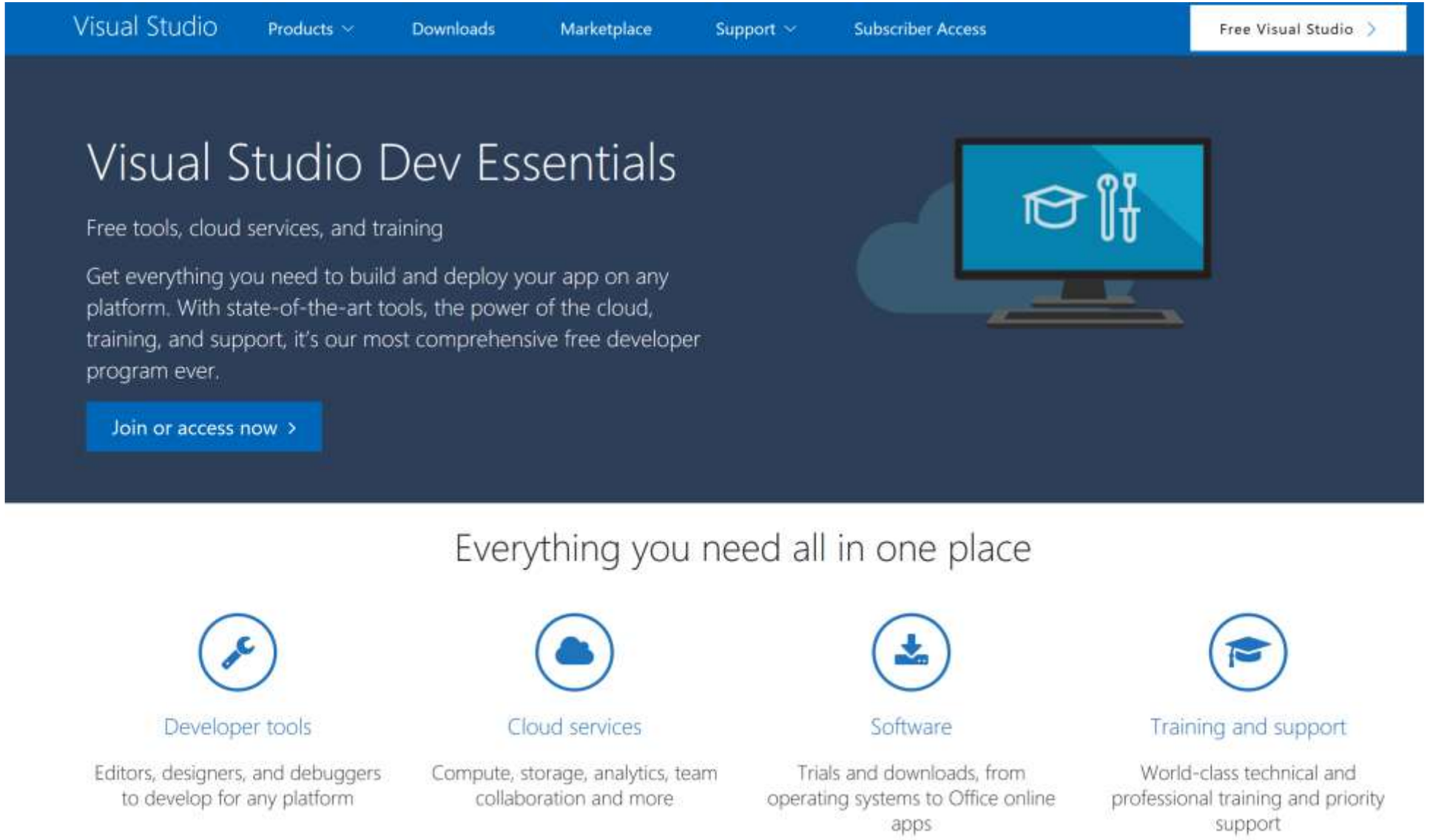
1) Traditional application

...You can stop at any stage

What to use when

Public Facing Website	Web Apps
Internal-Only Website	Web App Isolated
Standalone Executable	Web Job/Service Fabric
Microservices	Functions/Containers
Containers	Linux App Service/AKS/ACS/Service Fabric

Get your own Azure Subscription

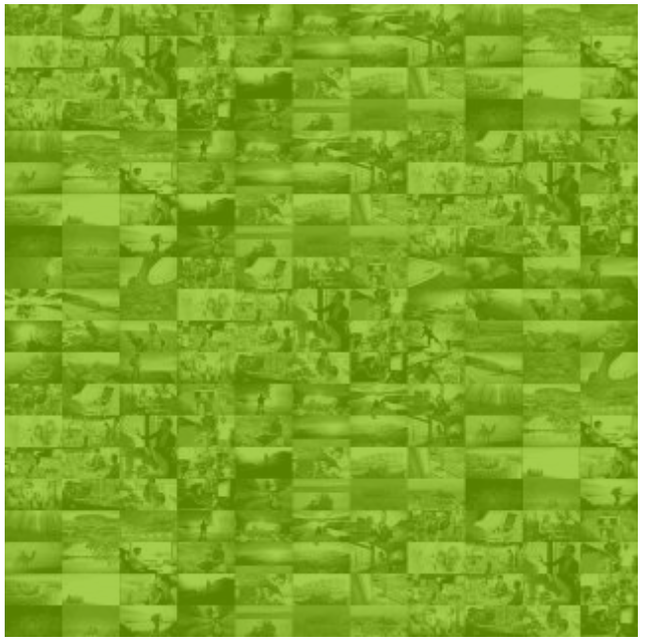


Additional Resources

- Microsoft
  - Azure Architecture Center
  - Azure Blog
- Third Party
  - Azure Build Weekly
  - Azure in Plain English

Microsoft mission

Empower every person and every organization on the planet to achieve more

Thank you