



# Azure Compute Platform Overview

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# It's a great time to be software engineer

*Never has so  
much computing  
been so accessible*



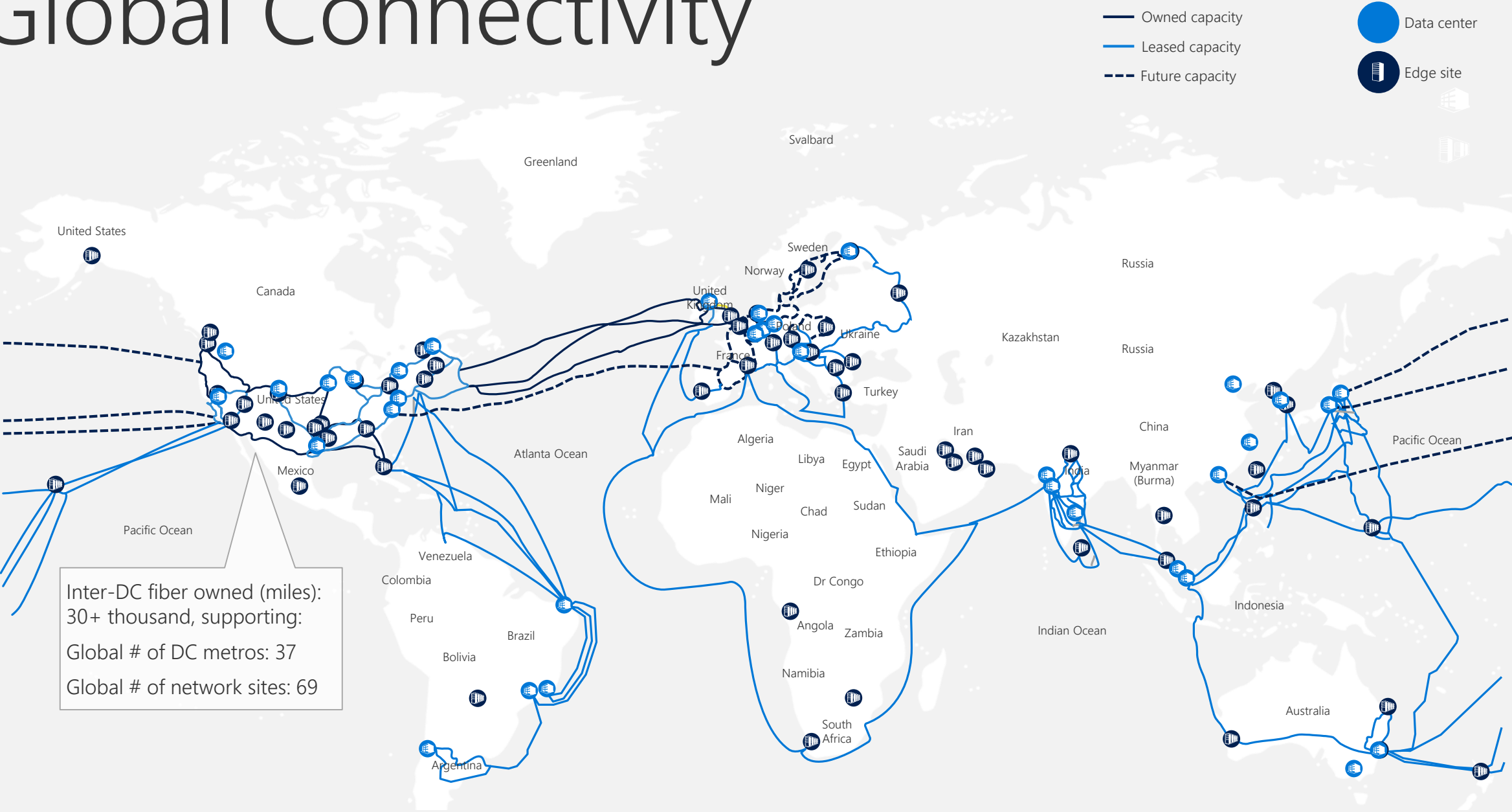


A world map with a light gray background. Blue circular markers, each consisting of a small solid blue dot surrounded by a larger, semi-transparent blue circle, are placed across the map to represent Azure regions. The markers are densely clustered in North America (primarily the United States), Europe (primarily Western and Central Europe), and East Asia (primarily China). There are also several markers in South America (primarily Brazil), Africa (primarily South Africa), the Middle East, Southeast Asia, and Australia.

50 Azure  
regions

Global Compute

# Global Connectivity



\*Datacenters and network sites not up to date

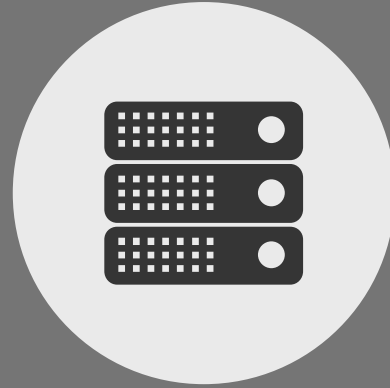
# The changing world of app development

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



**Physical  
Machines**

1990



**Virtual  
Machines**

2000



**Cloud  
Infrastructure**

2010



**Born in  
the Cloud**



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)

Responsibility	On-Prem	IaaS	PaaS	SaaS
Applications	Customer	Customer	Customer	Microsoft
Data	Customer	Customer	Customer	Microsoft
Runtime	Customer	Customer	Microsoft	Microsoft
Middleware	Customer	Customer	Microsoft	Microsoft
O/S	Customer	Customer	Microsoft	Microsoft
Virtualization	Customer	Microsoft	Microsoft	Microsoft
Servers	Customer	Microsoft	Microsoft	Microsoft
Storage	Customer	Microsoft	Microsoft	Microsoft
Networking	Customer	Microsoft	Microsoft	Microsoft

Customer

Microsoft

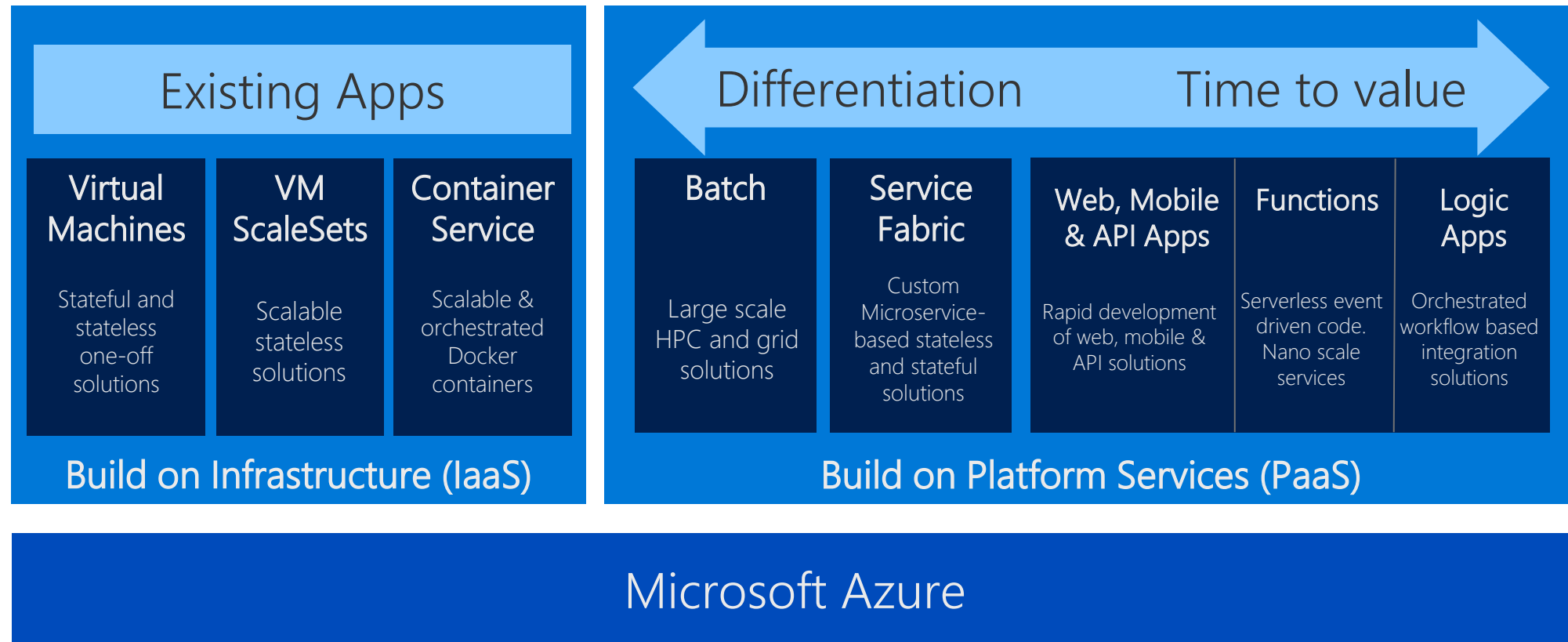
# "Get Me The Laziest People Money Can Buy"

Jeff Atwood, Coding Horror

Less building & maintaining frameworks

More solving business problems

# Azure IaaS & PaaS Spectrum





# Azure Application Platform Services



App Service

Web, mobile, API,  
logic apps, and containers

Web and mobile



Service Fabric

Cloud native, microservice-  
based apps, and containers

Microservice  
Platform



Functions

Serverless,  
event-driven compute

Serverless  
Compute



Containers

Azure Container Service,  
Container Instances, AKS

Containers



# Azure App Service

## Enterprise-grade apps



Global data center footprint



Hybrid support



AAD integrated



Secure + compliant

## Fully managed platform



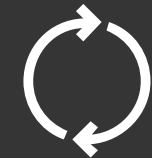
Built-in auto scale and load balancing



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\*

F1 Free	D1 Shared	B1 Basic	B2 Basic	S1 Standard	S2 Standard	P1V2 PremiumV2	P2V2 PremiumV2	I1 Isolated	I2 Isolated
Shared infrastructure	Shared infrastructure	1 Core	2 Core	1 Core	2 Core	1 Core	2 Core	1 Core	2 Core
1 GB Memory	1 GB Memory	1.75 GB RAM	3.5 GB RAM	1.75 GB RAM	3.5 GB RAM	3.5 GB RAM	7 GB RAM	3.5 GB RAM	7 GB RAM
10 GB Storage	10 GB Storage	10 GB Storage	10 GB Storage	50 GB Storage	50 GB Storage	SSD and faster CPU Dv2 series workers	SSD and faster CPU Dv2 series workers	SSD and faster CPU Dv2 series workers	SSD and faster CPU Dv2 series workers
Custom domains	Custom domains	Custom domains	Custom domains	Custom domains / SSL SNI Incl & IP SSL Support	Custom domains / SSL SNI Incl & IP SSL Support	250 GB Storage	250 GB Storage	App Service Environm... Single tenant system	App Service Environm... Single tenant system
SSL Support SNI SSL Included	SSL Support SNI SSL Included	SSL Support SNI SSL Included	SSL Support SNI SSL Included	Up to 10 instance(s) Auto scale	Up to 10 instance(s) Auto scale	Custom domains / SSL SNI Incl & IP SSL Support	Custom domains / SSL SNI Incl & IP SSL Support	Runs in your vNET Network isolated	Runs in your vNET Network isolated
Up to 3 instance(s) Manual scale	Up to 3 instance(s) Manual scale	Up to 3 instance(s) Manual scale	Up to 3 instance(s) Manual scale	Daily Backup	Daily Backup	Up to 20 instance(s) * Subject to availability	Up to 20 instance(s) * Subject to availability	Private app access Using an ILB ASE	Private app access Using an ILB ASE
				5 slots Web app staging	5 slots Web app staging	20 slots Web app staging	20 slots Web app staging	Used across ASE 1 TB Storage	Used across ASE 1 TB Storage
				Traffic Manager Geo availability	Traffic Manager Geo availability	Traffic Manager Geo availability	Traffic Manager Geo availability	Up to 100 instance(s) More upon request	Up to 100 instance(s) More upon request
Loading pricing...	Loading pricing...	Loading pricing...	Loading pricing...	Loading pricing...	Loading pricing...	Loading pricing...	Loading pricing...	Loading pricing...	Loading pricing...

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)

Swap

Choose which slots to swap

Swap type ⓘ  
Swap

Source  
Staging

Destination  
production

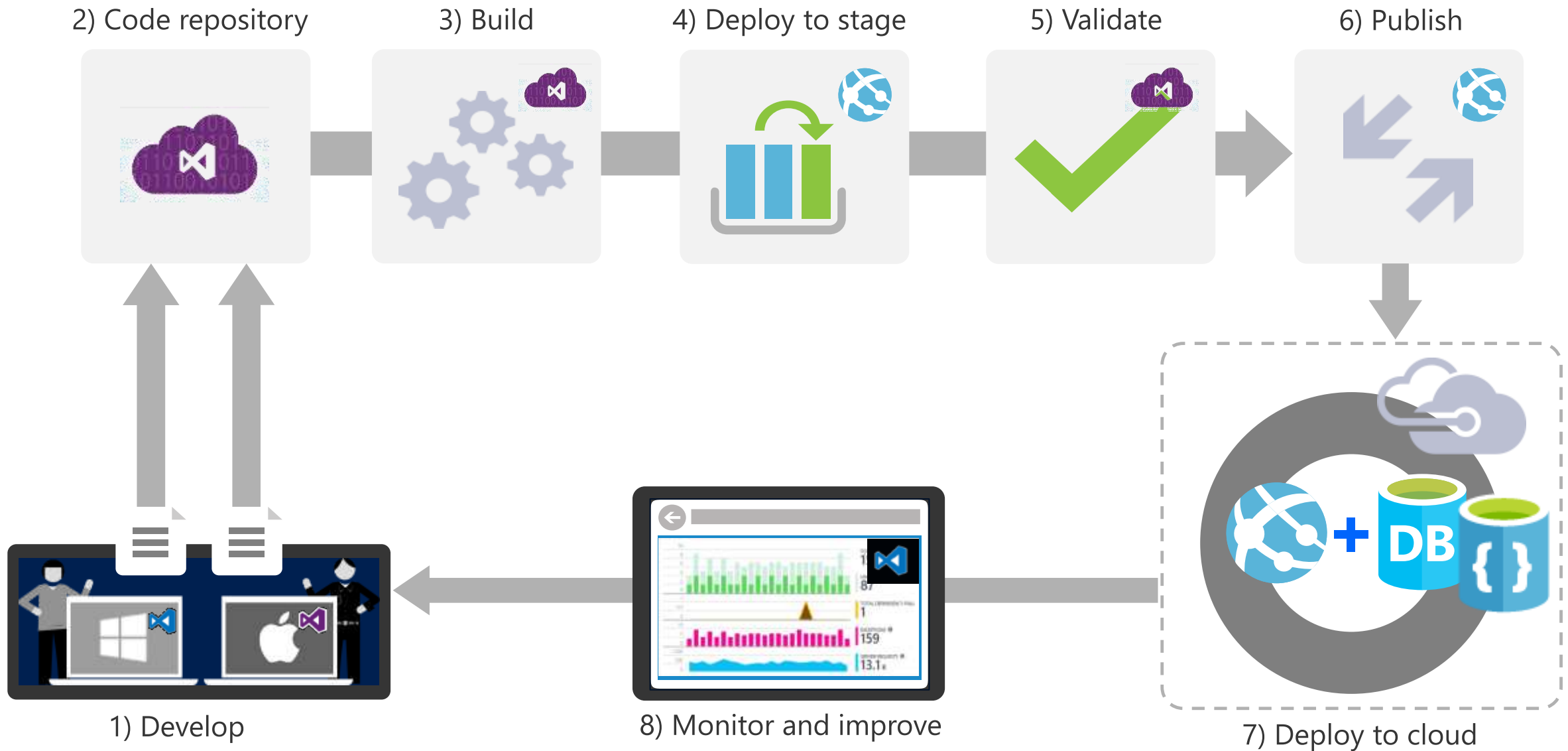
Static Routing ⓘ

	TRAFFIC %
Staging	20%
Choose deployment slot	Traffic %
production	80%

# 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)

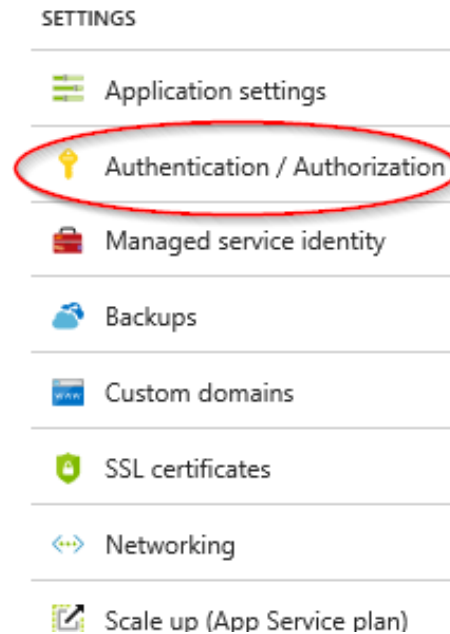


# Demo – Web App CI



# Authentication

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



## Authentication / Authorization



To enable Authentication / Authorization please ensure all your custom domains have corresponding SSL bindings .net version is configured to "4.5" and manage pipeline mode is set to "Integrated"

### App Service Authentication

Off

On

### Action to take when request is not authenticated

Log in with Azure Active Directory



### Authentication Providers



Azure Active Directory

Not Configured



Facebook

Not Configured



Google

Not Configured



Twitter

Not Configured



Microsoft

Not Configured



### Advanced Settings

Token Store

Off

On

# Demo – Web App Auth

# Logging and Monitoring

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

Application Logging (Filesystem) ⓘ

Off	On
-----	----

Application Logging (Blob) ⓘ

Off	On
-----	----

Web server logging ⓘ

Off	Storage	File System
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Detailed error messages ⓘ

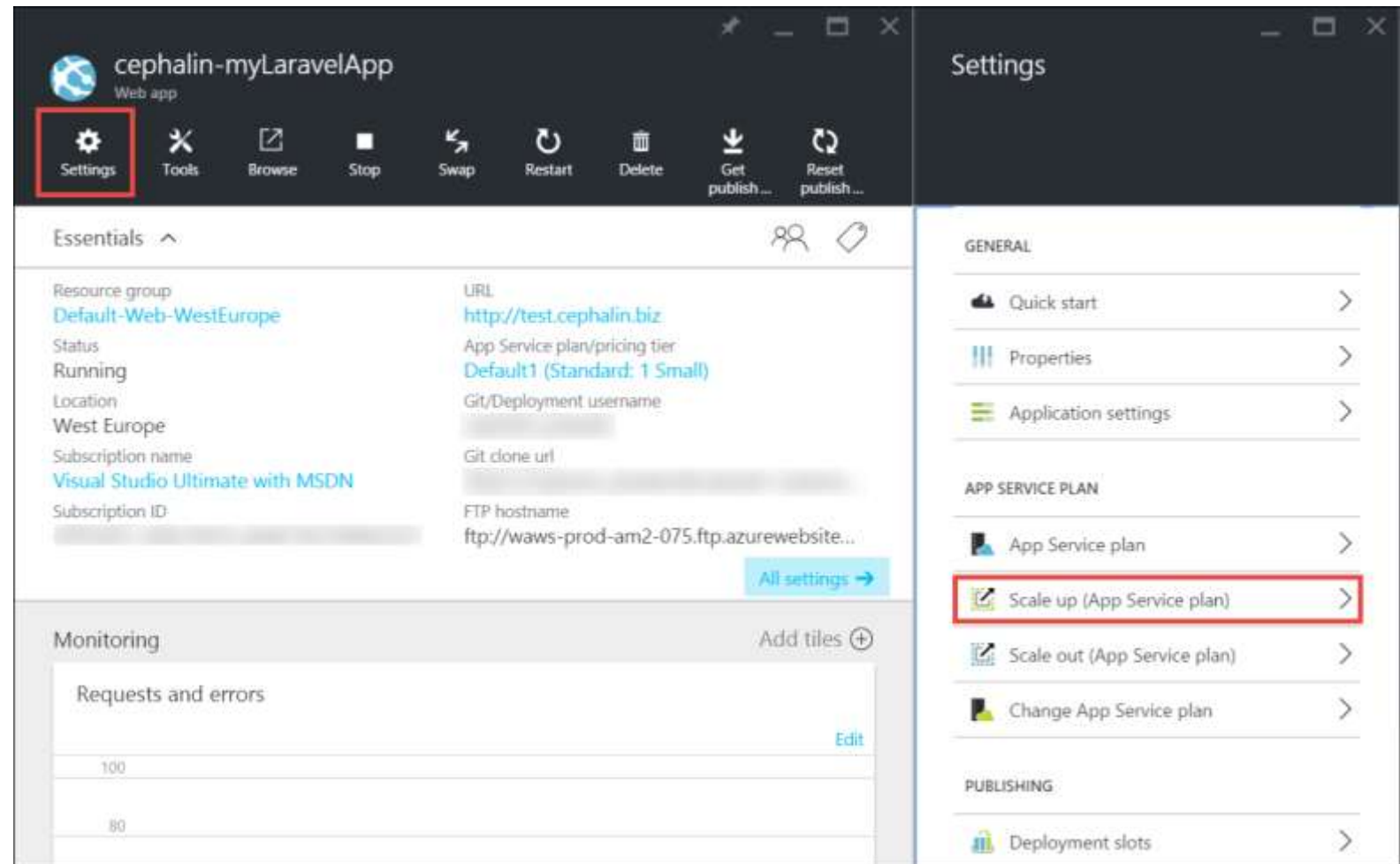
Off	On
-----	----

Failed request tracing ⓘ

Off	On
-----	----

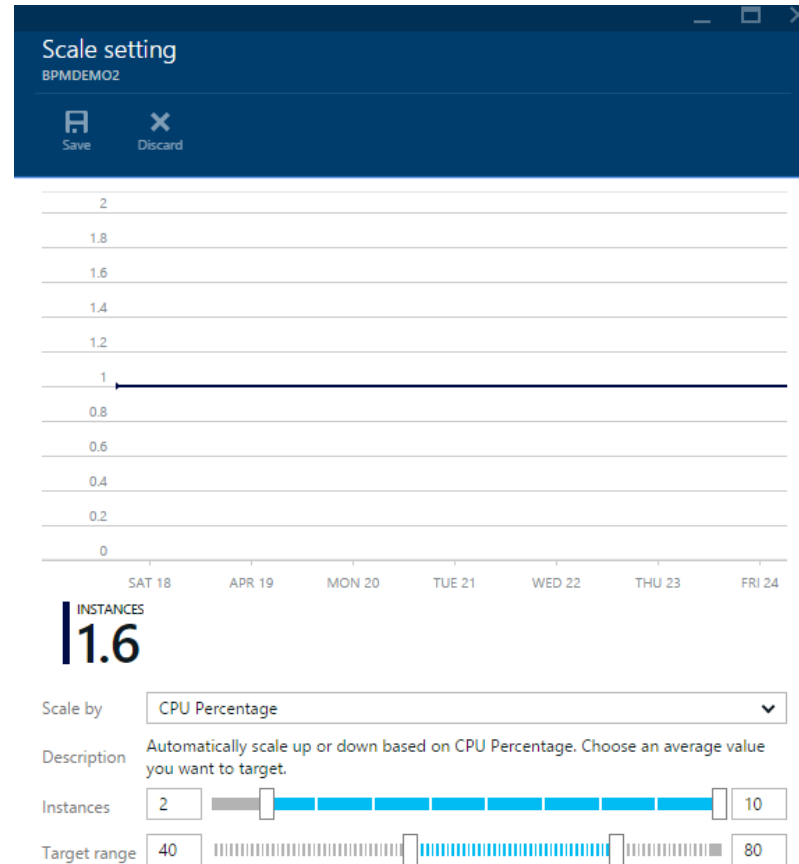
# Scaling Up

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



# Scaling Out

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



The 'Scale profile' window contains the following configuration options:

- Name:** Default
- Type:** always, recurrence (selected), fixed date
- Target range:** 1 to 10
- Days:** 5 selected
- Start time:** 00:00
- Time zone:** (UTC-08:00) Pacific Time (US & Canada)



# 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

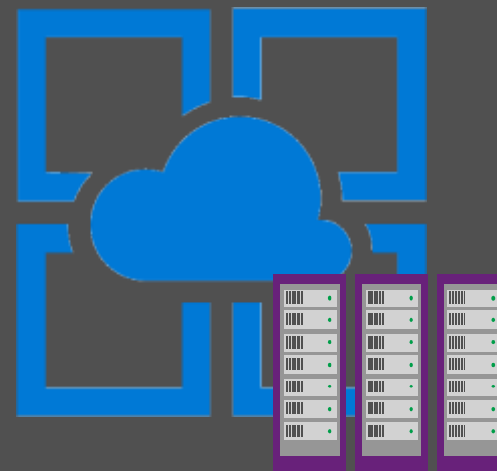
*App Service Environment*



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

## On Premise

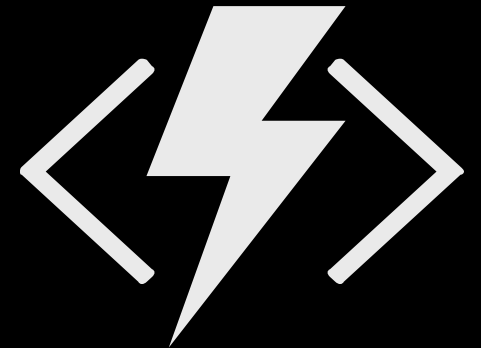
*Azure Stack*



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

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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

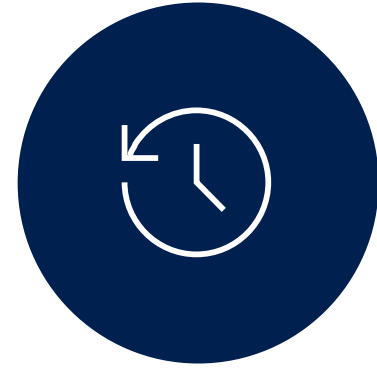
# Benefits of Serverless



Manage apps,  
not servers



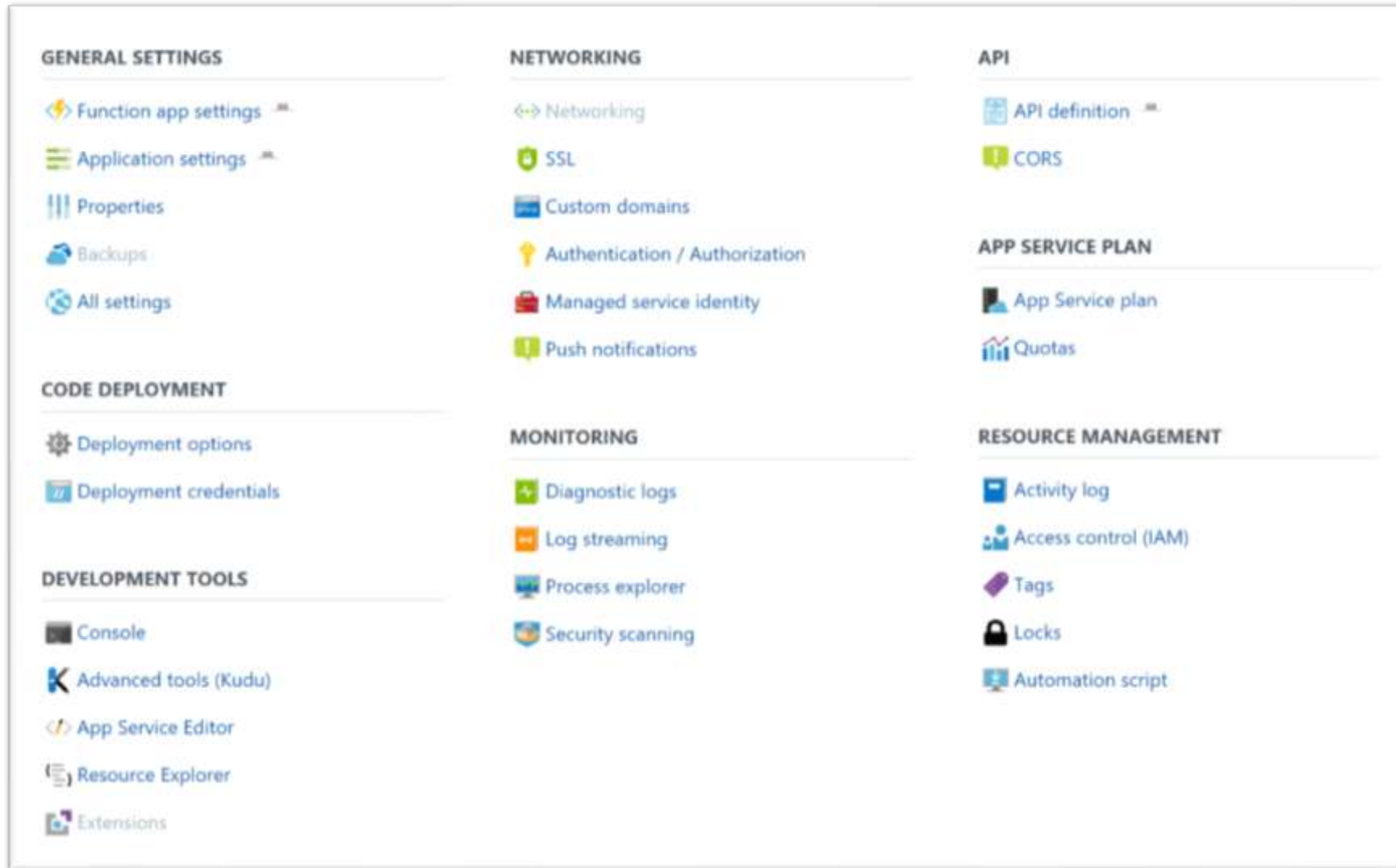
Reduced  
DevOps



Faster time to  
market

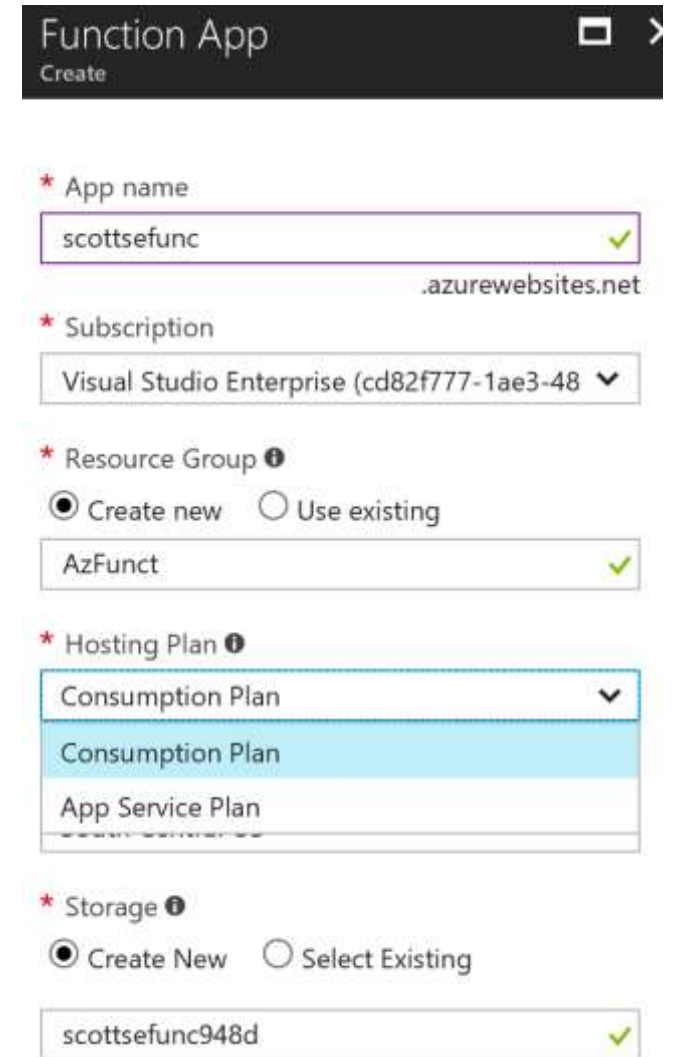


# Functions are based on App Service



# 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




The screenshot shows the 'Function App' creation wizard in the Azure portal. The title bar at the top says 'Function App' with a 'Create' button. The form includes the following fields:

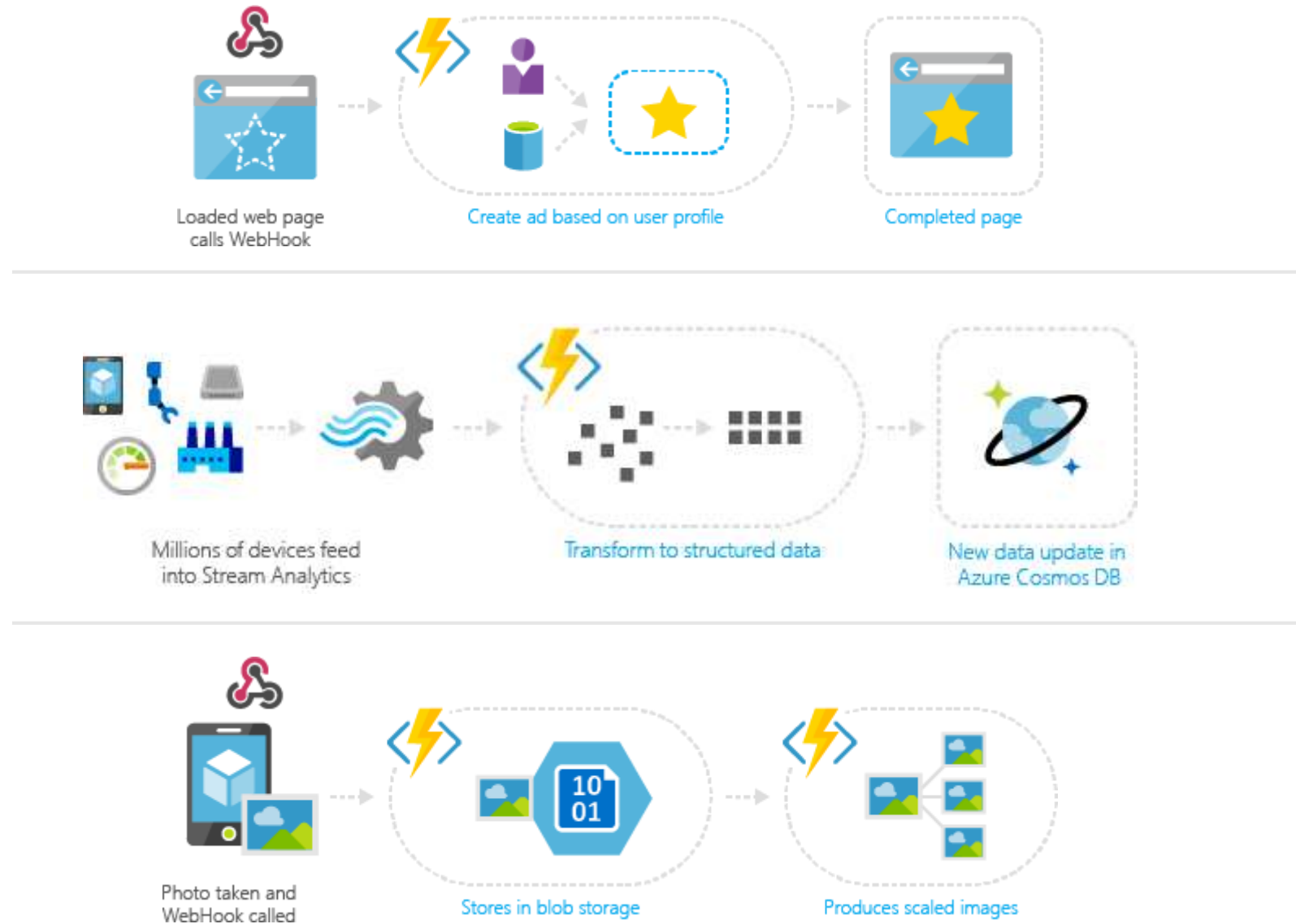
- App name:** A text box containing 'scottsefunc' with a green checkmark and a '.azurewebsites.net' domain suggestion.
- Subscription:** A dropdown menu showing 'Visual Studio Enterprise (cd82f777-1ae3-48)'.
- Resource Group:** Radio buttons for 'Create new' (selected) and 'Use existing'. Below is a text box with 'AzFuncnt' and a green checkmark.
- Hosting Plan:** A dropdown menu with 'Consumption Plan' selected. The dropdown list is open, showing 'Consumption Plan' and 'App Service Plan' as options.
- Storage:** Radio buttons for 'Create New' (selected) and 'Select Existing'. Below is a text box with 'scottsefunc948d' and a green checkmark.

# Triggers and Bindings

Trigger + Input ➡ Output

Type	Trigger	Input	Output
<a href="#">Blob Storage</a>	✓	✓	✓
<a href="#">Cosmos DB</a>	✓	✓	✓
<a href="#">Event Grid</a> 	✓		
<a href="#">Event Hubs</a>	✓		✓
<a href="#">Notification Hubs</a>			✓
<a href="#">Queue storage</a>	✓		✓
<a href="#">SendGrid</a>			✓
<a href="#">Service Bus</a>	✓		✓
<a href="#">Table storage</a>		✓	✓
<a href="#">Timer</a>	✓		
<a href="#">Twilio</a>			✓
<a href="#">Webhooks</a>	✓		✓

# 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

1



# 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

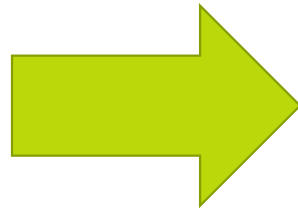
Packaging & Deployment

Policy Enforcement

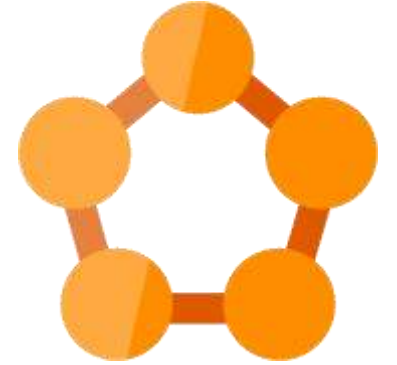
Granular Versioning

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



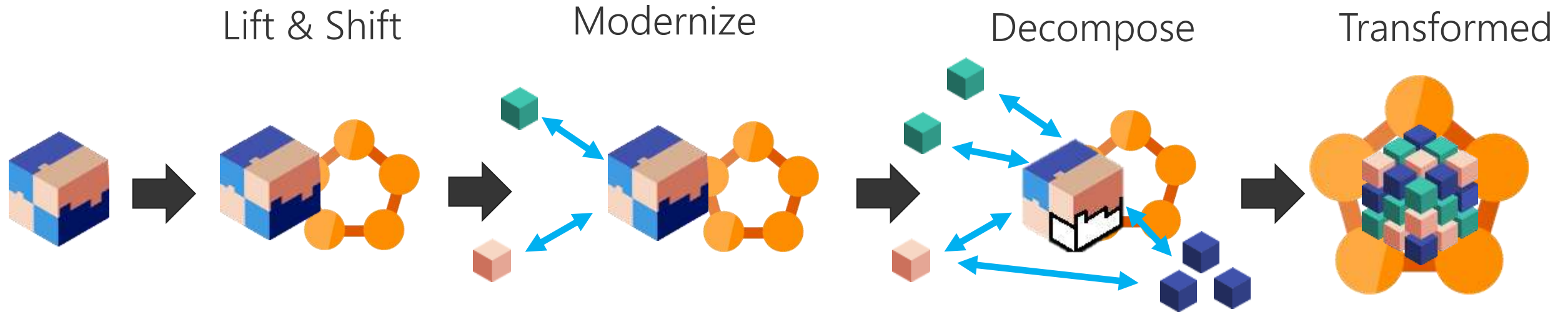
Power BI

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

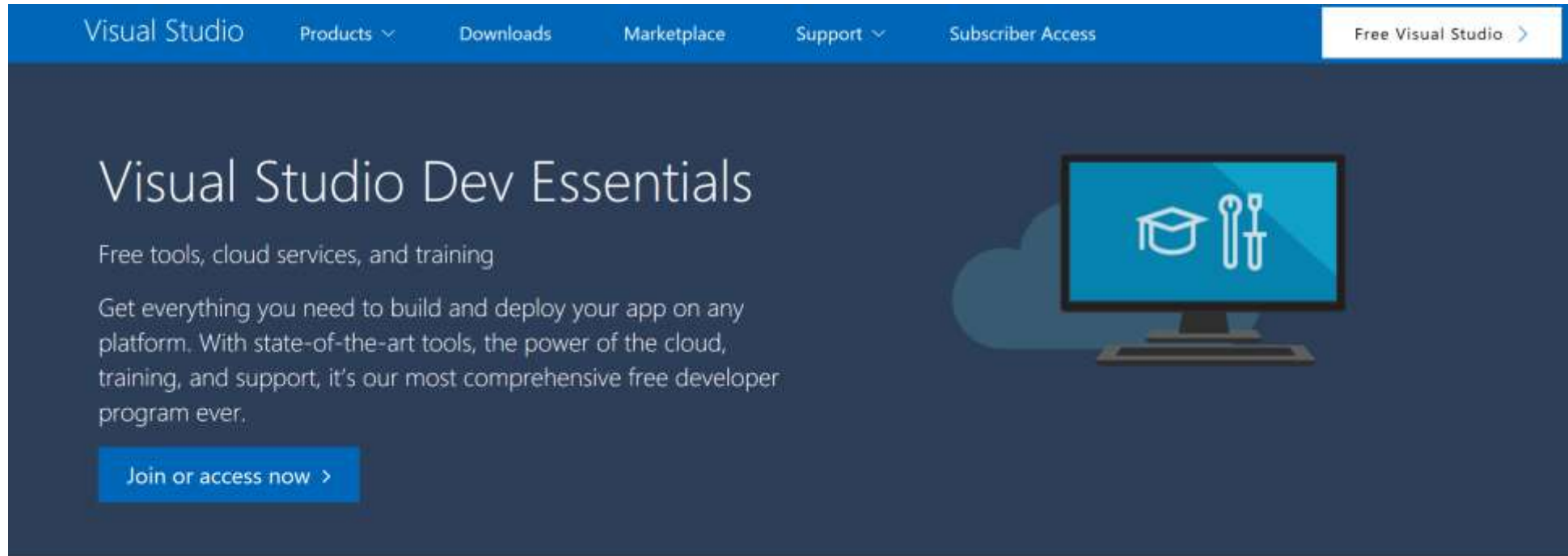
Standalone Executable      Web Job/Service Fabric

Microservices      Functions/Containers

Containers      Linux App Service/AKS/ACS/Service Fabric



# Get your own Azure Subscription



The screenshot shows the Visual Studio Dev Essentials landing page. The top navigation bar is blue with links for Visual Studio, Products, Downloads, Marketplace, Support, and Subscriber Access. A white button labeled 'Free Visual Studio' is on the right. The main content area has a dark blue background. On the left, the text 'Visual Studio Dev Essentials' is followed by 'Free tools, cloud services, and training' and a paragraph about the comprehensive free developer program. A blue button 'Join or access now' is below. On the right, there is an illustration of a computer monitor displaying a graduation cap and a wrench icon.

Visual Studio Products Downloads Marketplace Support Subscriber Access Free Visual Studio >

## Visual Studio Dev Essentials

Free tools, cloud services, and training

Get everything you need to build and deploy your app on any platform. With state-of-the-art tools, the power of the cloud, training, and support, it's our most comprehensive free developer program ever.

[Join or access now >](#)

Everything you need all in one place



Developer tools

Editors, designers, and debuggers to develop for any platform



Cloud services

Compute, storage, analytics, team collaboration and more



Software

Trials and downloads, from operating systems to Office online apps



Training and support

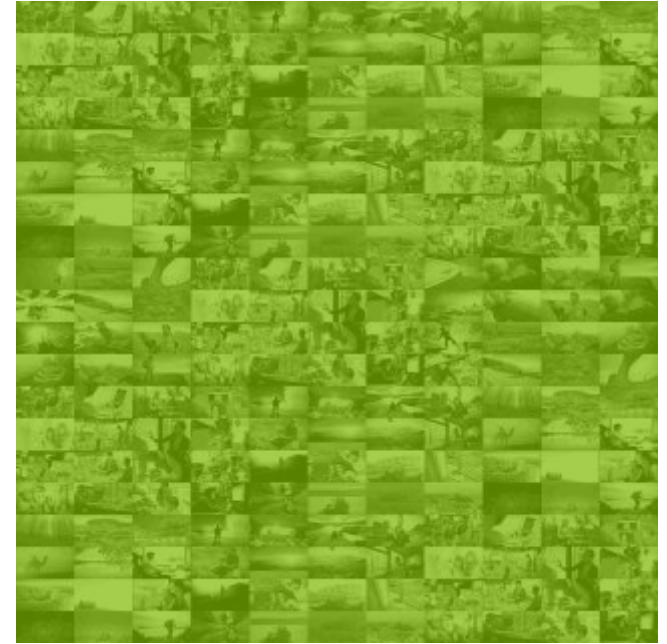
World-class technical and professional training and priority support

# 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