

Azure Activate for App Service Environment

The Essentials




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Learning Units covered in this Module

	App Service Introduction	—
	Scaling	—
	Monitoring	—



Objectives

After completing this Learning, you will be able to:

Understand....

✓ Explain App Service different hosting options

✓ How to scale an app service

Configure alerts

Provision a new ASE



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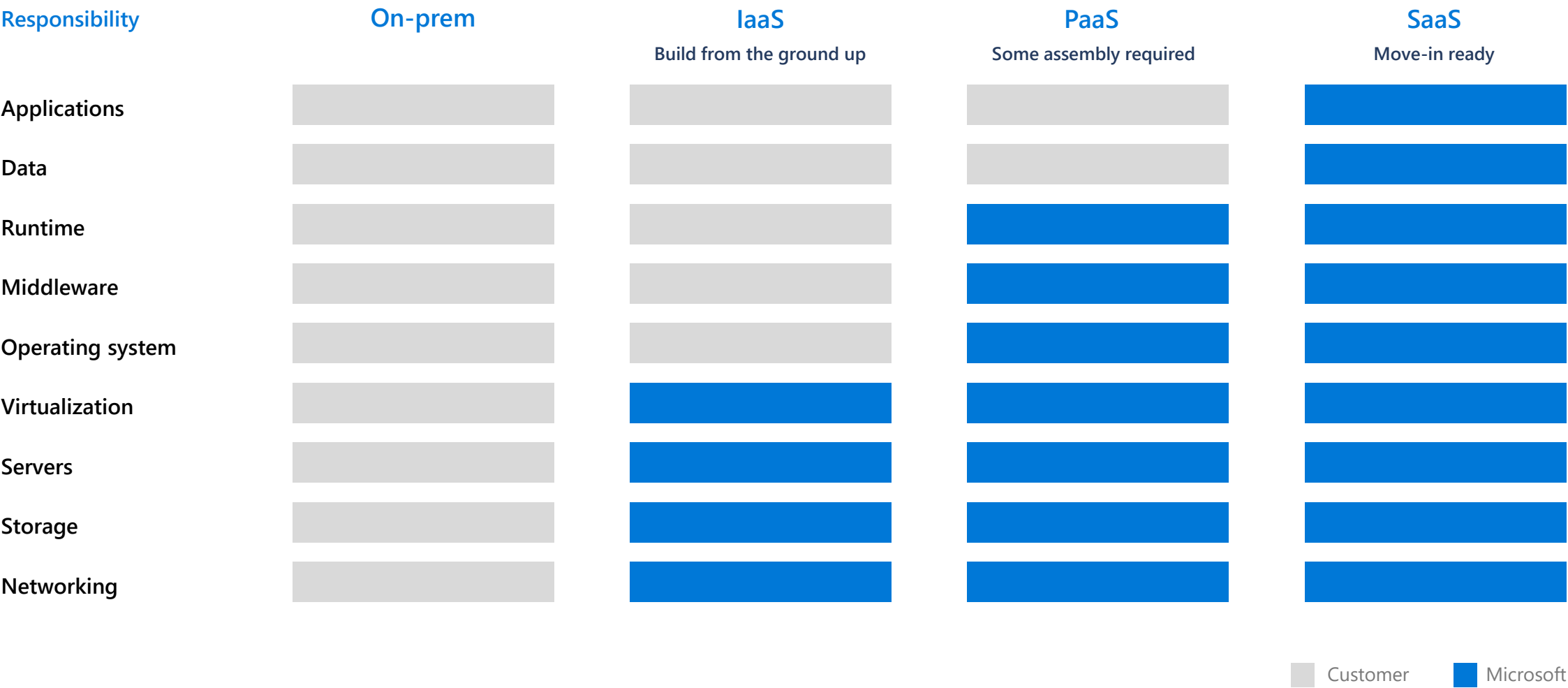
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Azure App Service Intro

Activate Azure App Service Environment

The traditional tenants of hosting

Choose the right balance of control and responsibility based on your needs



Cloud application hosting continuum



Challenges

Patching, Management, Deployment

Management (Container & Pod)

Limitations of Execution environment

Cold start, long running process

What you get

Curated VM Hosting

Curated Orchestration

Curated Execution Environment

Scale to 'zero'

Technology decisions

IT/Infra focused Value Prop

Dev/App Admin focused Value Prop

More Control of execution environment

Less Control of execution environment

Less Agile development & deployment

More Agile development & deployment

Azure App Service



A cloud app platform for delivering modern enterprise apps across cloud and mobile devices.

An integrated offering that delivers features and capabilities from a number of existing Azure services

Enterprise
Grade Apps

Fully
Managed
Platform

High
Productivity
Development

Azure App Service benefits



High-productivity for devs & ops



.NET, Node, Java, Docker,
PHP, Ruby, Python



Deploy containers on
Windows & Linux



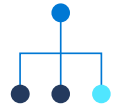
Staging & deployment



Testing in production



App gallery marketplace



Fully-managed



Auto scale & load
balancing



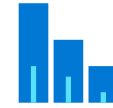
High availability w/auto
patching



Reduced operations costs



Backup & recovery



Enterprise-grade



Global data center
footprint



Hybrid support



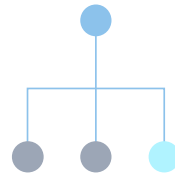
Azure Active Directory
integration



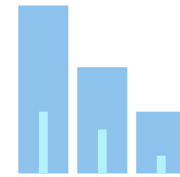
Secure & compliance



High-productivity
for both devs & ops



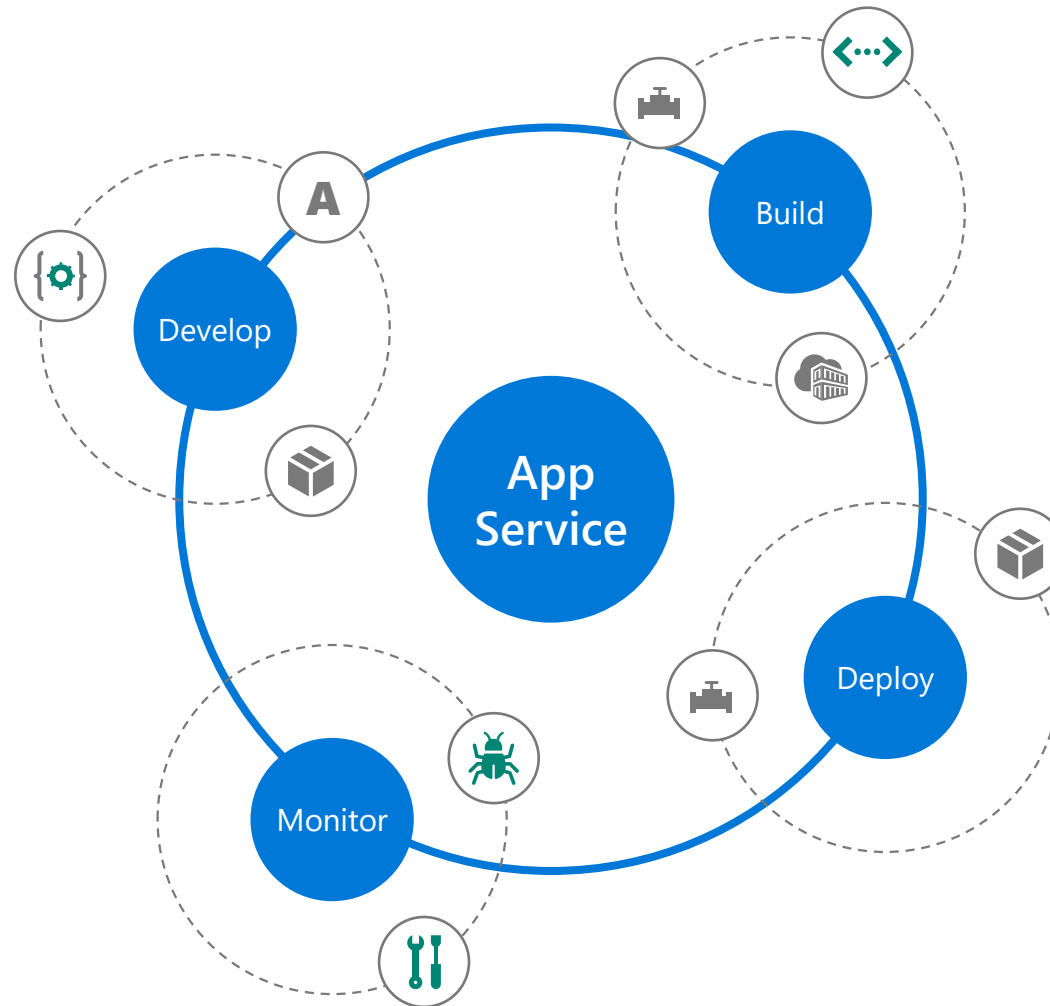
Fully-managed



Enterprise-grade

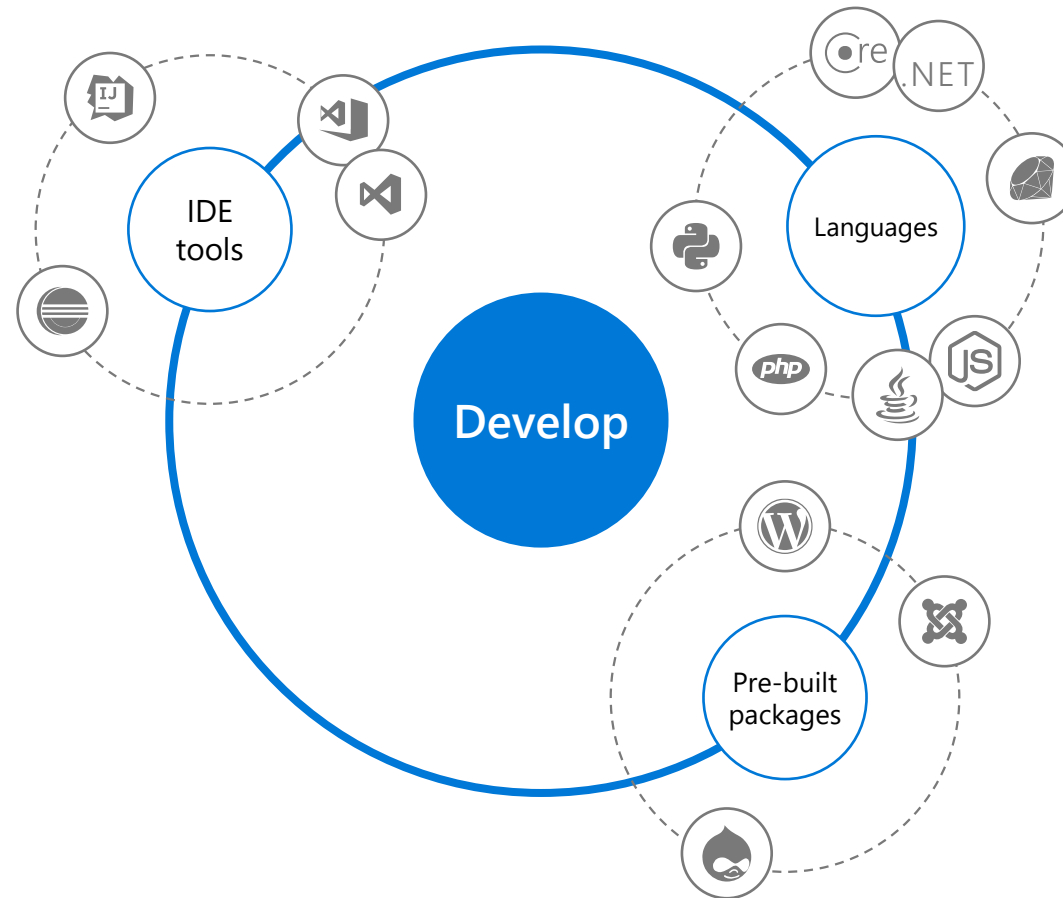
High productivity

Your choice of languages, pre-built packages, and tools



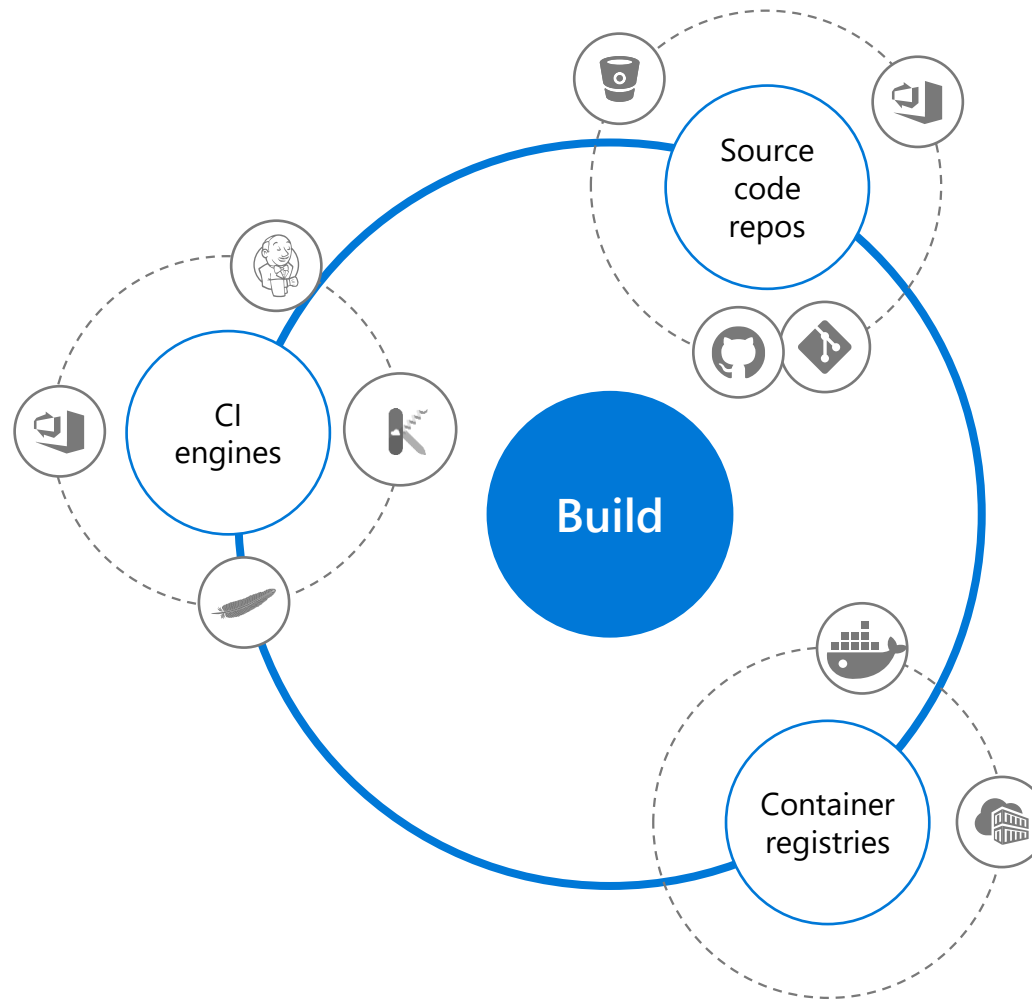
Develop

Choose your IDE tools, languages, and pre-built packages



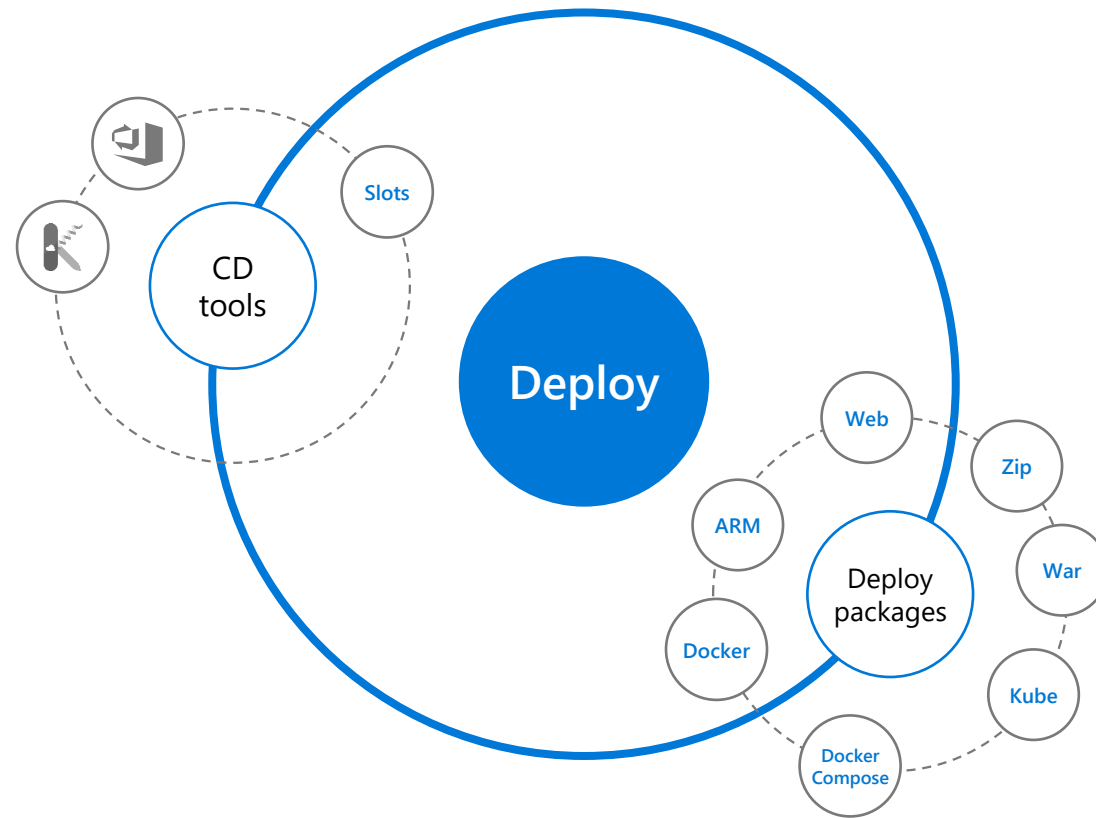
Build

Your choice of CI engines, source code repositories, and container registries



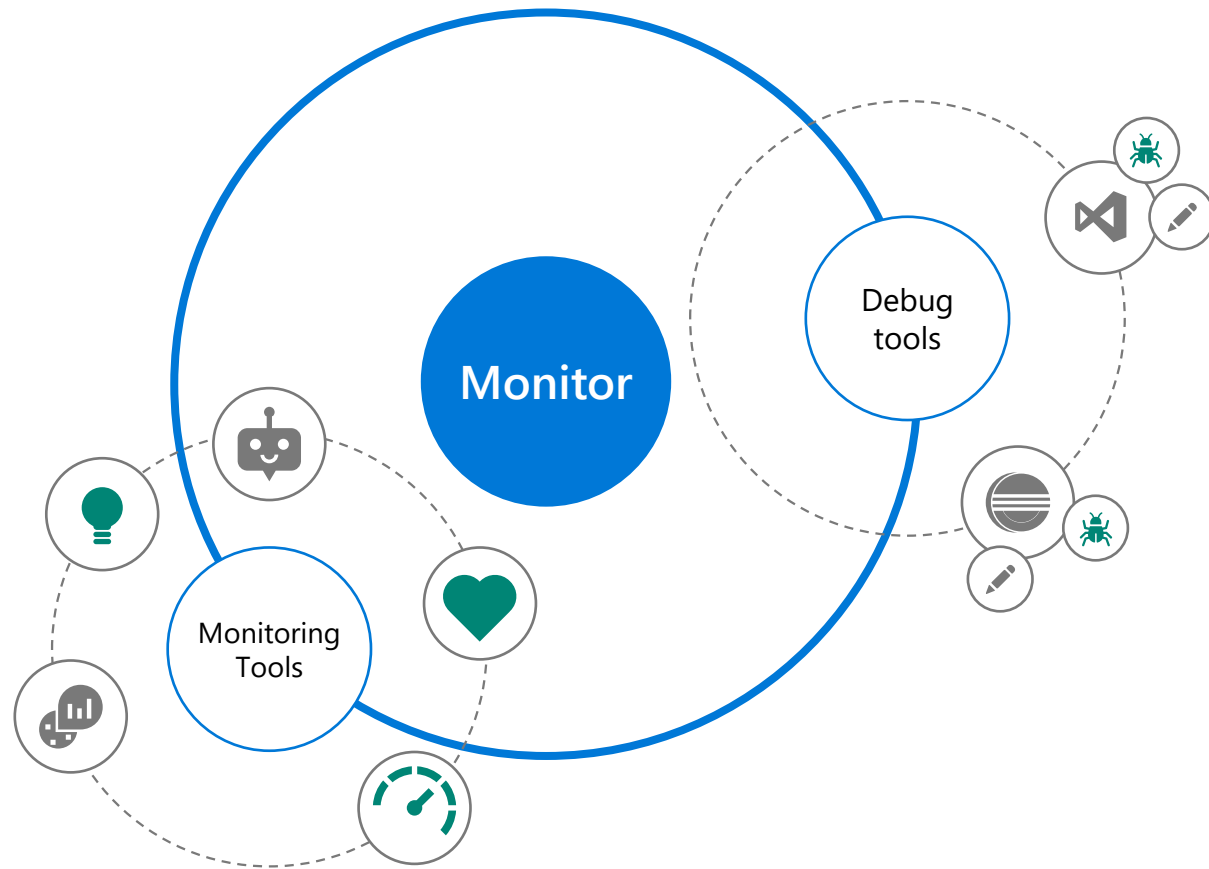
Deploy

Use Docker to Kube packages and CD tools like slots to increase your productivity



Monitor

Choose your monitoring and debugging tools



See your apps in action

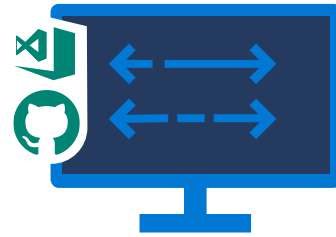
Built-in capabilities to automate rapid develop-build-deploy-monitor loop

Develop

Build

Deploy

Monitor



Tight Git integration



See your apps in action

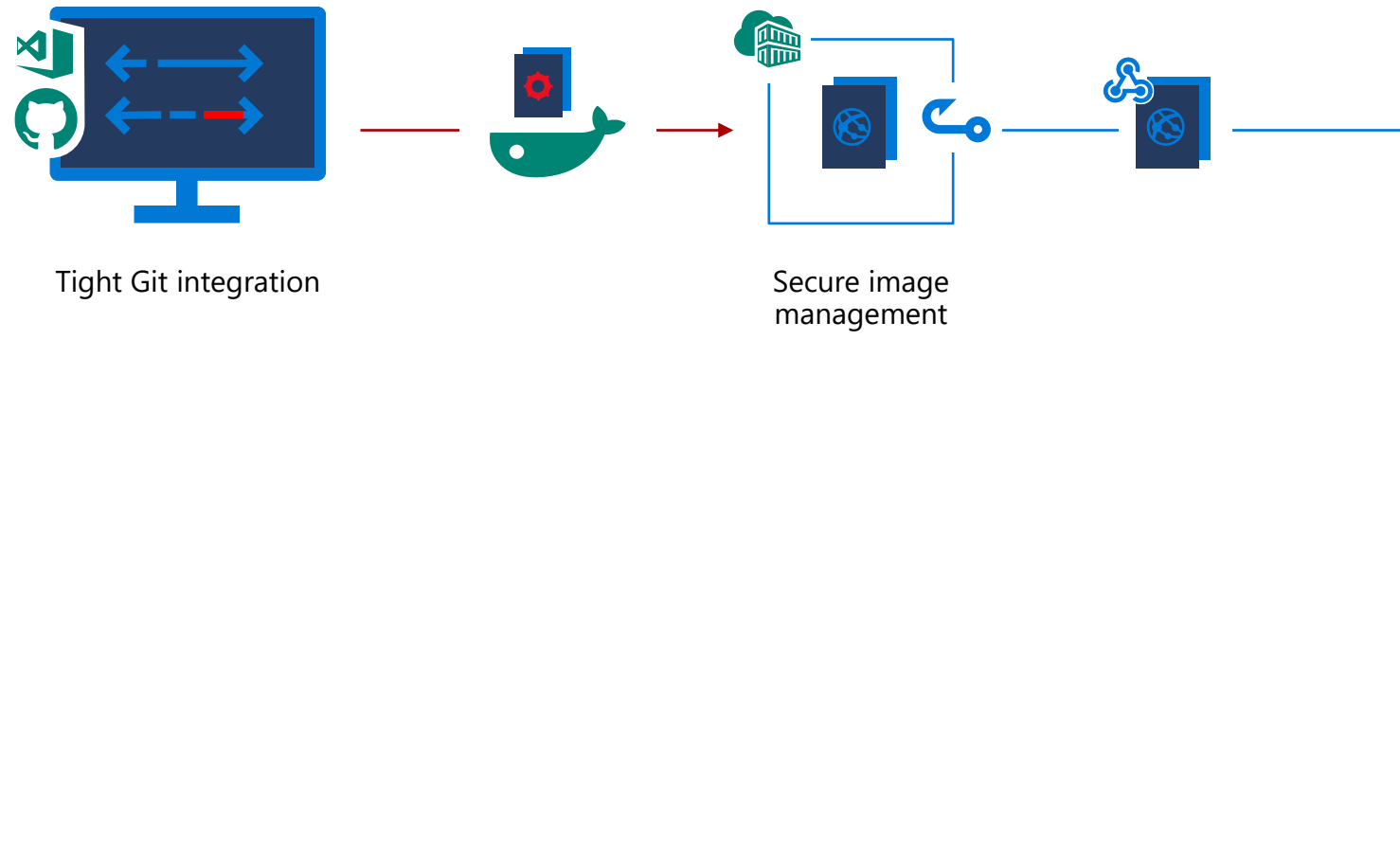
Built-in capabilities to automate rapid develop-build-deploy-monitor loop

Develop

Build

Deploy

Monitor



See your apps in action

Built-in capabilities to automate rapid develop-build-deploy-monitor loop

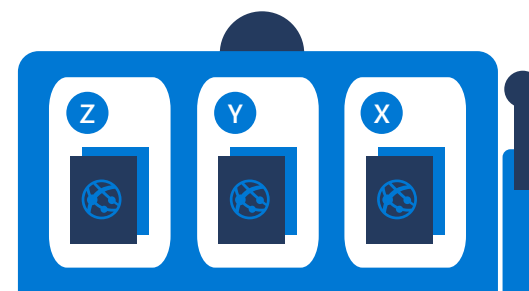
Develop

Build

Deploy

Monitor

Deployments Slots and test
in production for A/B testing



Z
Y
X



Promote updates with confidence
or roll back without downtime

Continuous
delivery



See your apps in action

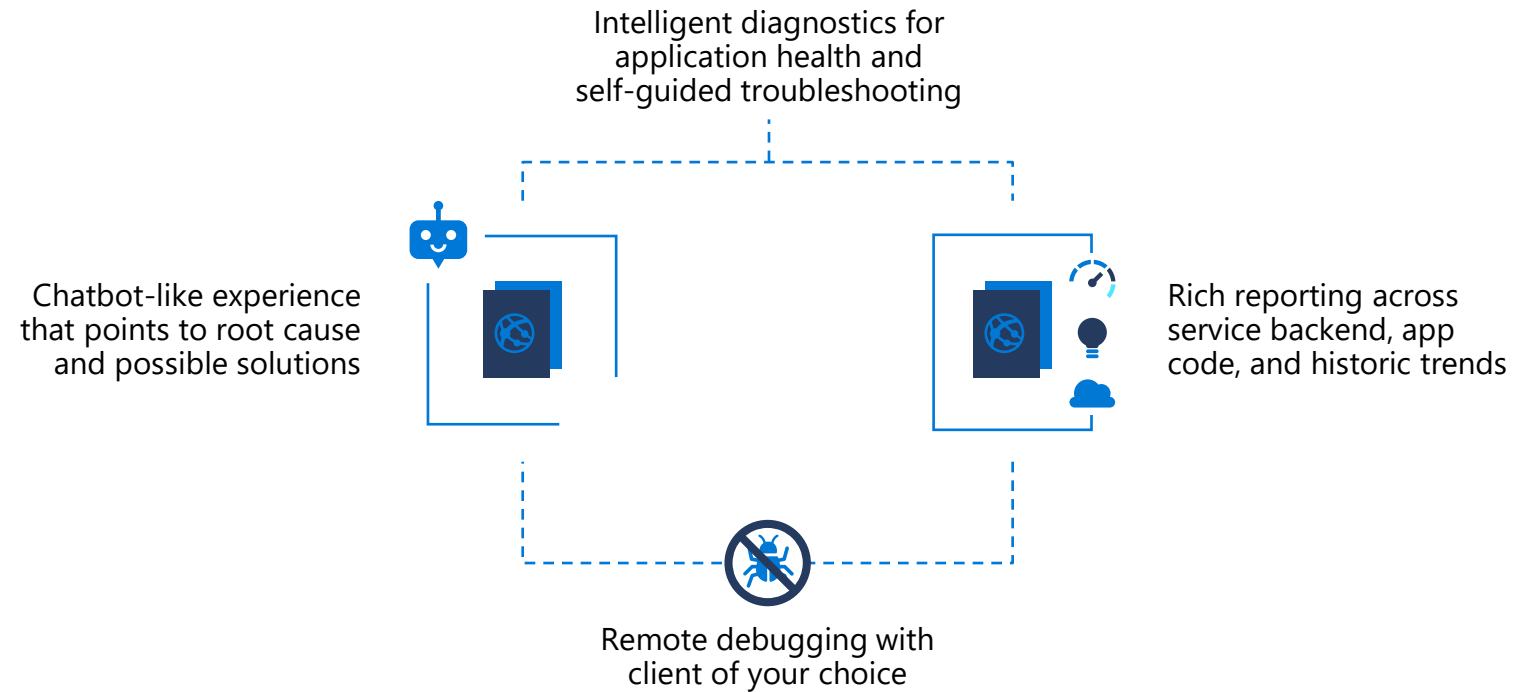
Built-in capabilities to automate rapid develop-build-deploy-monitor loop

Develop

Build

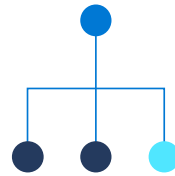
Deploy

Monitor

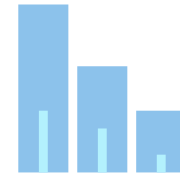




High-productivity
for both devs & ops



Fully-managed



Enterprise-grade

Start with the basics

Focus on your business logic, we'll handle the rest



Auto-scale &
load balancing



High availability
with auto patching



Reduced
operations costs

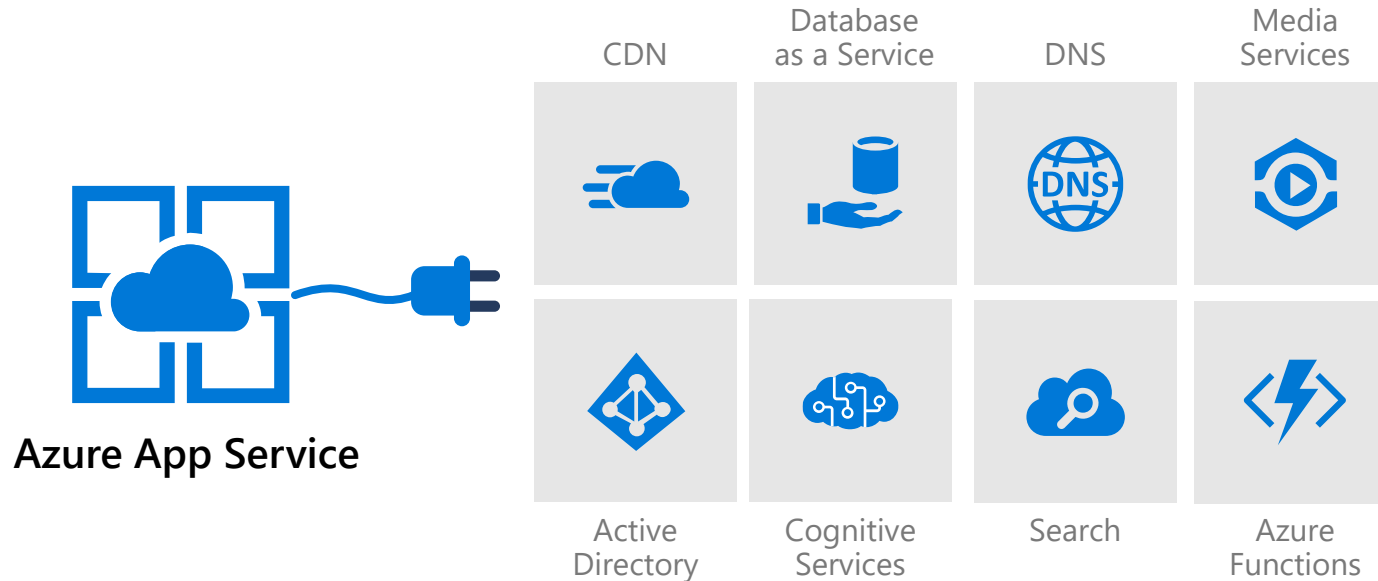


Backup &
recovery



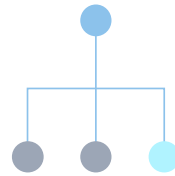
Easily extend your application's capabilities

Connect to other managed services to meet specific web app needs

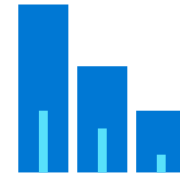




High-productivity
for devs & ops



Fully-managed



Enterprise-grade

Choose your hosting options

Our selection of hosting options give you the control you want



Azure App Service (multi-tenant)

Get your Web, API, or Mobile App created in seconds in the cloud. We provide the plumbing, you provide the application code or container(s).



App Service Environment

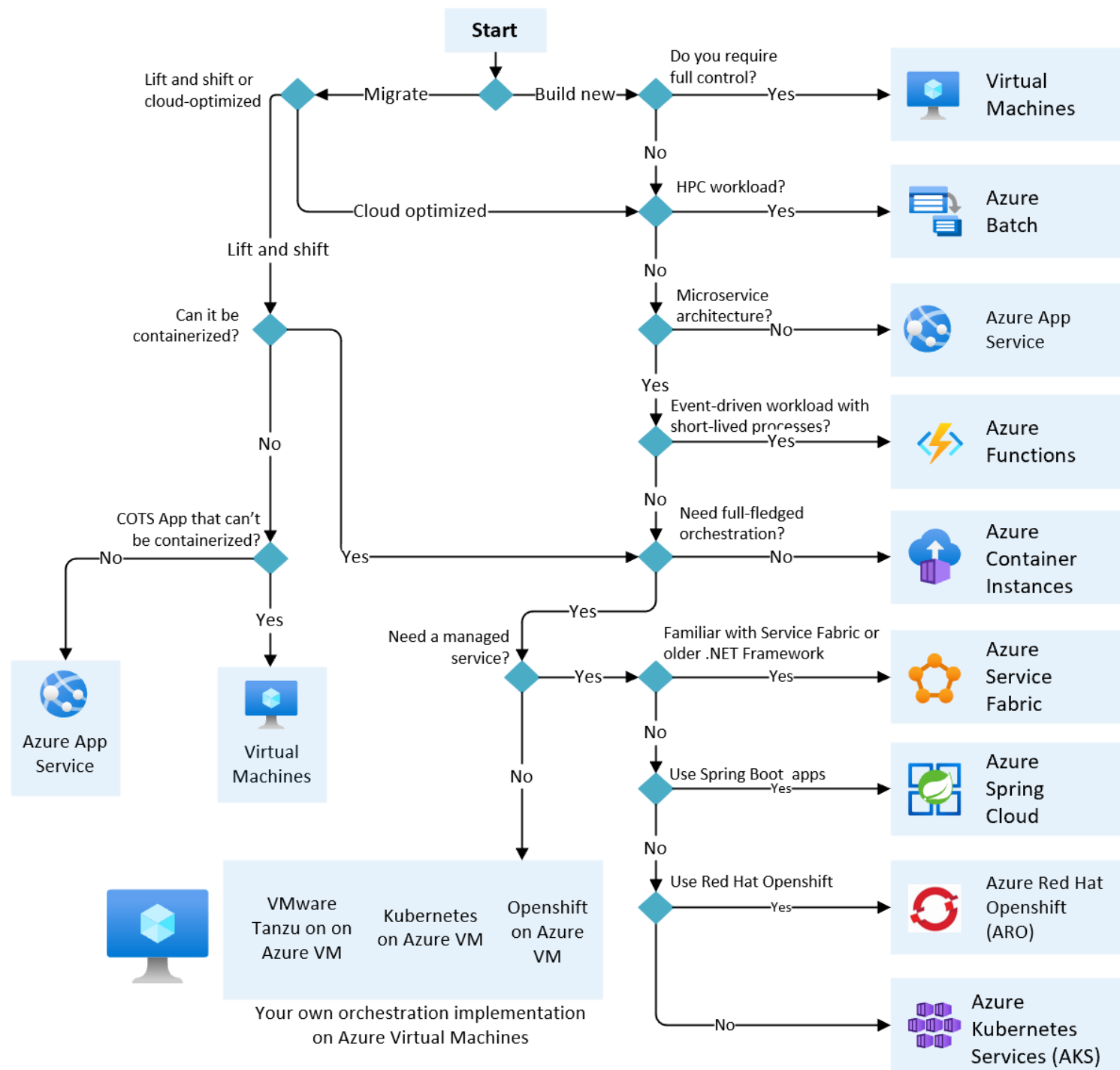
Run your apps in virtual network at high scale. Create an isolated environment specifically for your organization and access/manage all of the resources behind your public endpoint.



Azure Stack

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





Azure App Service services



=



Web apps

Web apps that scale with your business



Mobile apps

Build mobile apps for any device



Functions

Serverless event based development accelerator



API apps

Easily build and consume APIs in the cloud

App Service Plans

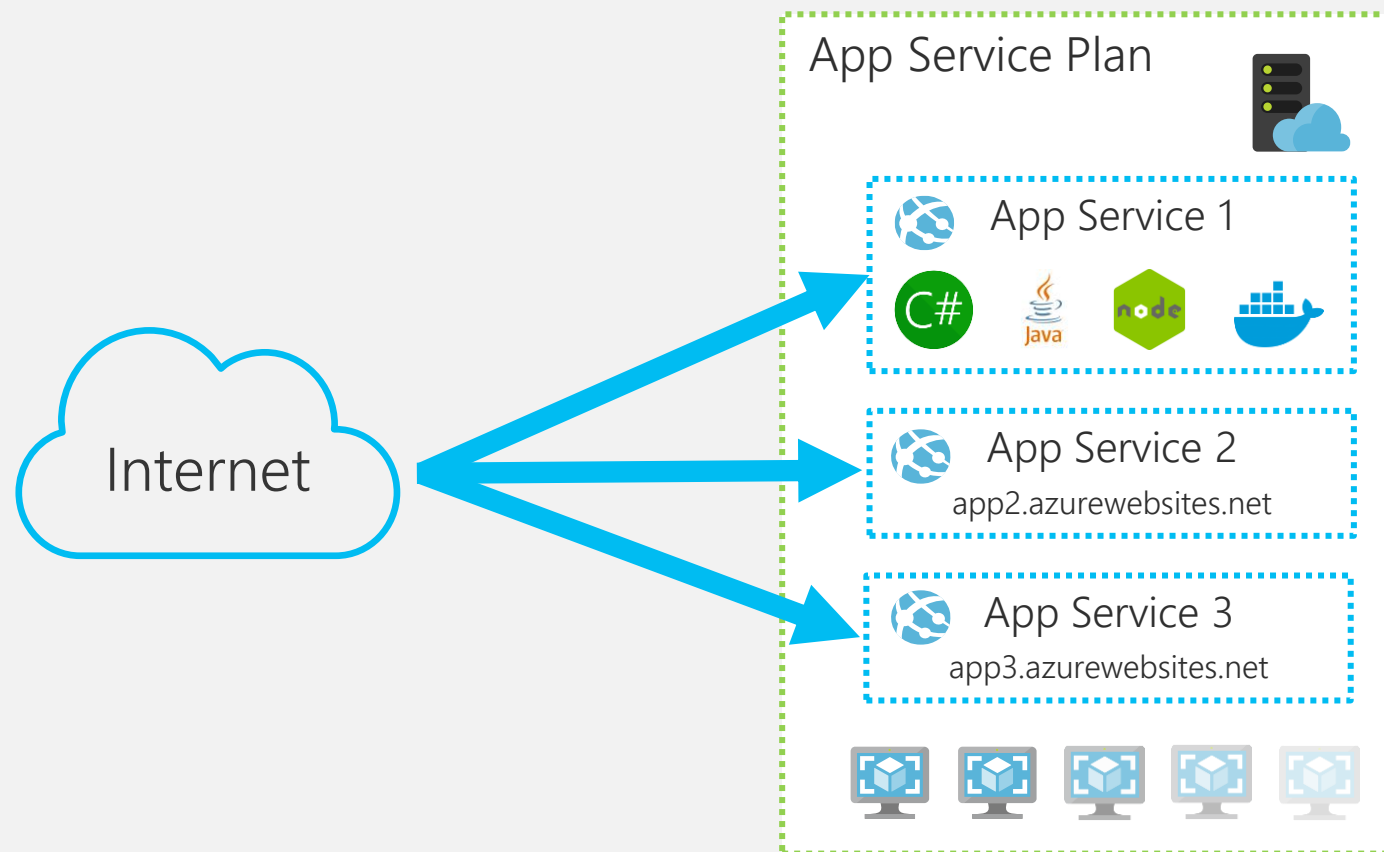
- An App Service plan is a set of virtual server resources that run App Service apps
- Every App Service web app you create must be assigned to a single App Service plan that runs it.
- A single App Service plan can host an unlimited number of App Service web apps
- App Service plans are the unit of billing for App Service.
- A plan's size (sometimes referred to as its sku or pricing tier) determines the performance characteristics of the virtual servers that run the apps
 - **Shared compute:** Free and Shared
 - **Dedicated compute:** Basic, Standard, Premium
 - **Isolated:** runs dedicated Azure VMs on dedicated Azure Virtual Networks



App Service

- ✓ Supports Windows and Linux platforms
- ✓ Global scale on demand
- ✓ Built-in autoscale and load balancing
- ✓ High availability with auto-patching
- ✓ Public endpoint
- ✓ Deployment slots
- ✓ Native language support for .NET, PHP, Ruby, Node.js, Java, Python + any containerized web app

App Service Basics

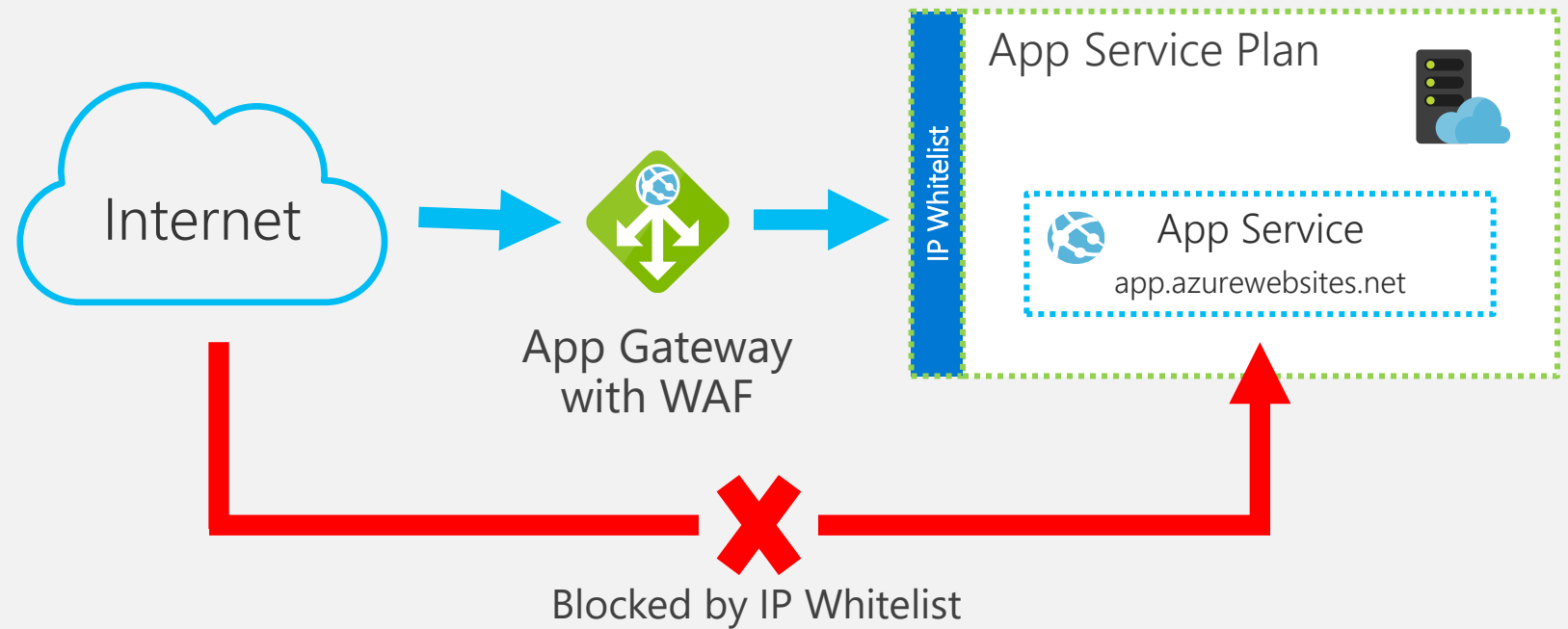




App Service

- ✓ Protects web apps from vulnerabilities and attacks
- ✓ Can protect multiple apps
- ✓ Custom WAF policies
- ✓ TLS/SSL termination
- ✓ App Service protected by IP whitelisting

App Service behind App Gateway & WAF

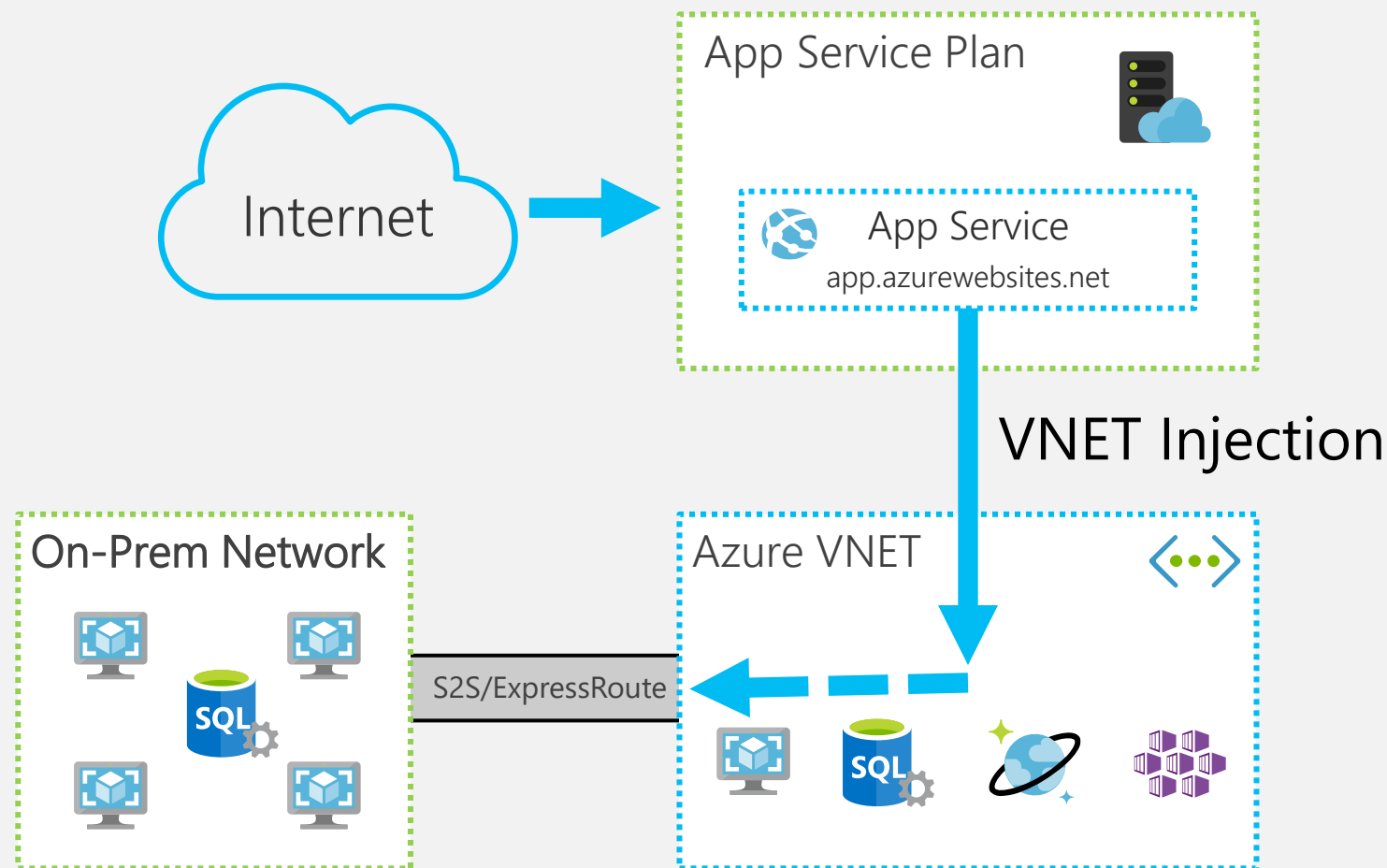




App Service

- ✓ Accessing resources in Resource Manager VNets in the same region
- ✓ Accessing resources that are secured with service endpoints
- ✓ Accessing resources that are accessible across ExpressRoute or VPN connections
- ✓ Securing all outbound traffic
- ✓ Force tunneling all outbound traffic

App Service with VNET Integration

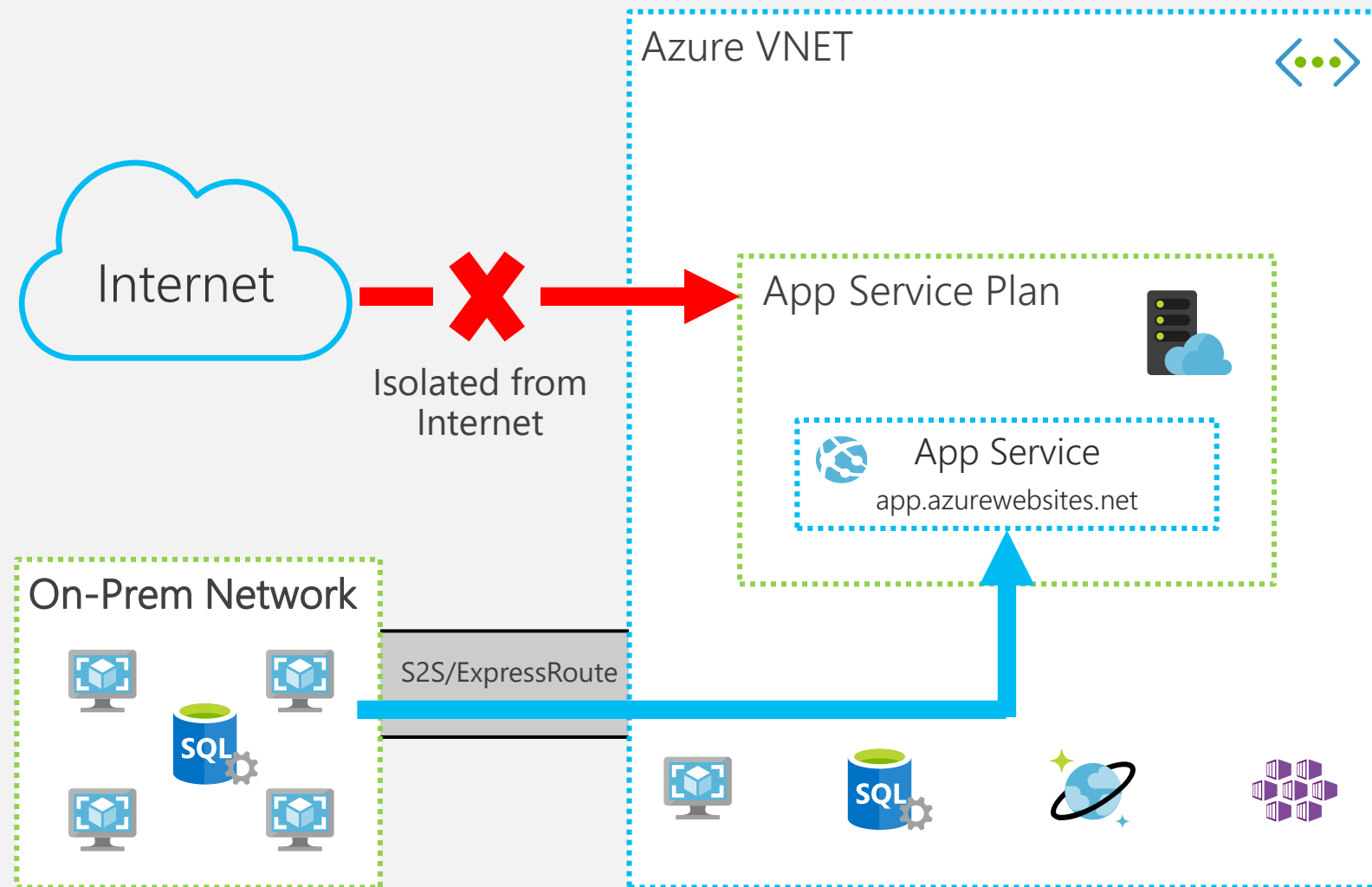




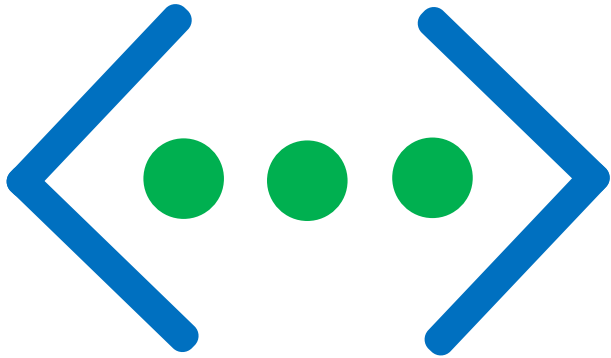
App Service

- ✓ Isolate apps from the internet
- ✓ Prevent data exfiltration
- ✓ Private IPs for service resources
- ✓ Traffic remains on private network components

App Service with Private Link



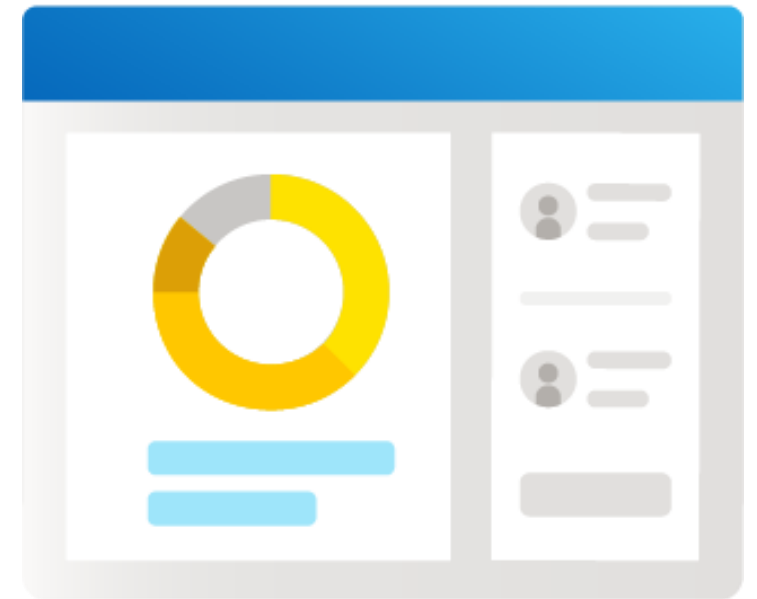
Azure Virtual Network (VNET)



- Private network in the Azure cloud
 - Usually uses RFC1918 private IP addresses
- Enables network-based security and isolation
 - Control access with Network Security Groups (NSGs)
- Can be used with VPNs to create hybrid cloud applications
 - Customers can control routes for IP traffic to go through those VPNs

Demonstration

Create App Service

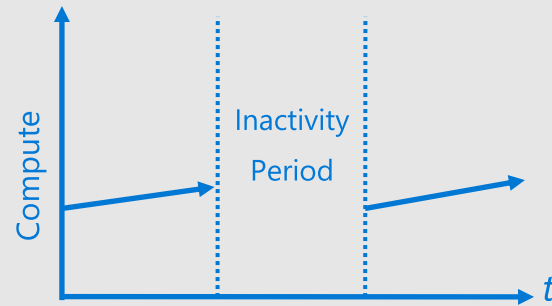


Scaling

Web App: Scaling – Cloud Computing Patterns

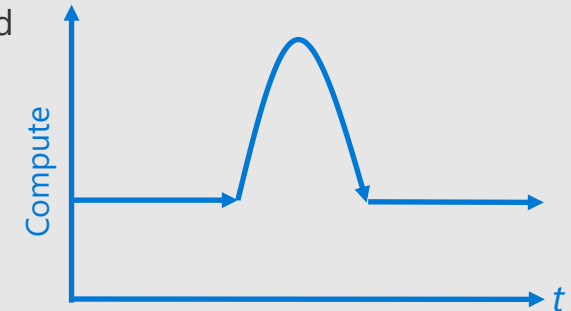
ON AND OFF

- On & off workloads (e.g. batch job)
- Over provisioned capacity is wasted
- Time to market can be cumbersome



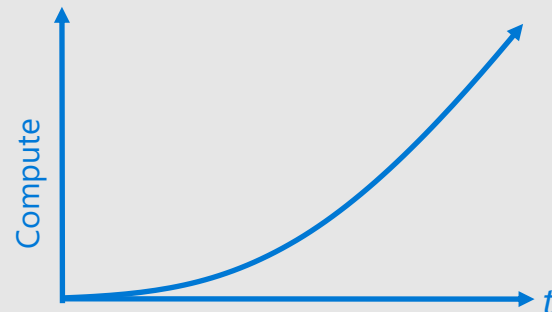
UNPREDICTABLE BURSTS

- Unexpected/unplanned peak in demand
- Sudden spike impacts performance
- Can't over provision for extreme cases



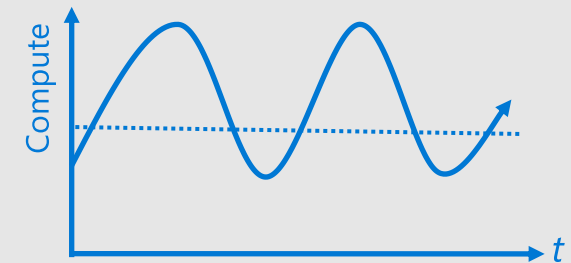
GROWING FAST

- Successful services needs to grow/scale
- Keeping up w/growth is big IT challenge
- Cannot provision hardware fast enough



PREDICTABLE BURSTS

- Services with micro seasonality trends
- Peaks due to periodic increased demand
- IT complexity and wasted capacity



Azure App Service: Web App – Scaling UP vs. Scaling OUT

SCALE UP



Vertical – VM Size

1 Core	w	/	1.75 GB	RAM
2 Cores	w	/	3.50 GB	RAM
4 Cores	w	/	7.00 GB	RAM

SCALE OUT



Horizontal – VM Count

Max 3* instances
Max 10 instances
Max 20/50** instances

Azure App Service: Web App

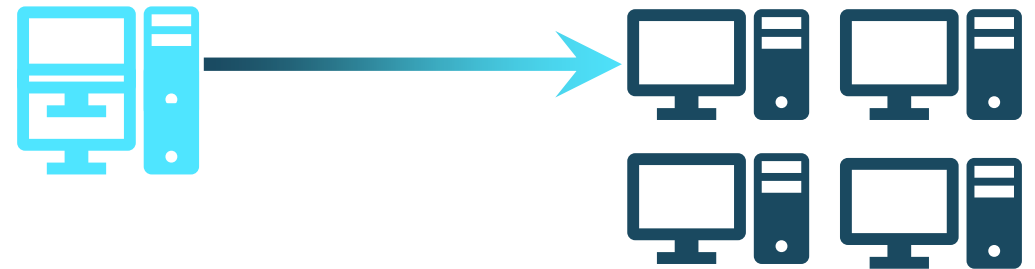
- **Web App: Scaling**

- **Vertical Scaling**

- Say 8 cores / 16 GB → 16 Core / 64 GB
 - Change hosting plan tier or VM
 - Generally needs downtime / more work
 - Upgrade or downgrade may not be possible in all cases
 - Typically stateful applications

- **Horizontal Scaling**

- Create additional instances
 - Add identical VMs
 - Scale up and down is usually seamless.
 - Can be done manually, configured or scripted or scheduled or triggered!
 - Applications can be stateless (best case) / stateful




Azure App Service: Web App – Manual vs. Auto Scaling

Manual – Scale via Portal or Scripts

* Scale by

Description Manual setup means that the number of instances you choose won't change, even if there are changes in load.

Instances



Auto – CPU Percentage

* Scale by

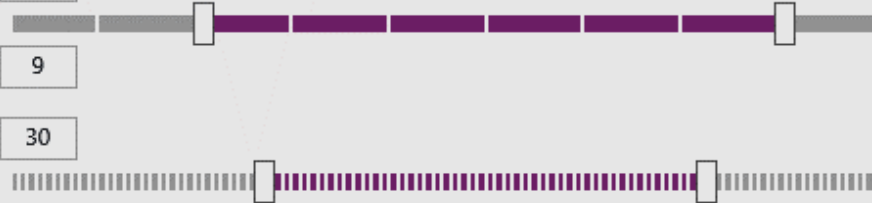
Description Automatically scale up or down based on CPU Percentage. Choose an average value you want to target.

Instances

Instances

Instances

Target range



Auto – Schedule & Performance Rules

* Scale by

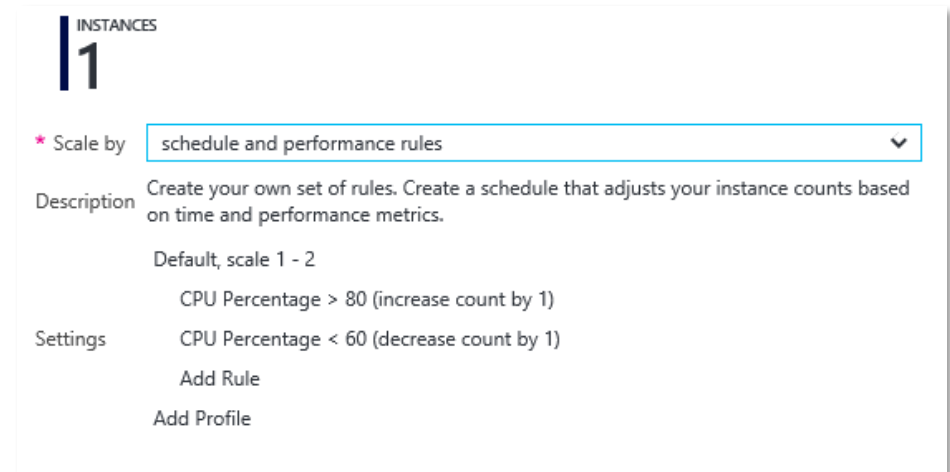
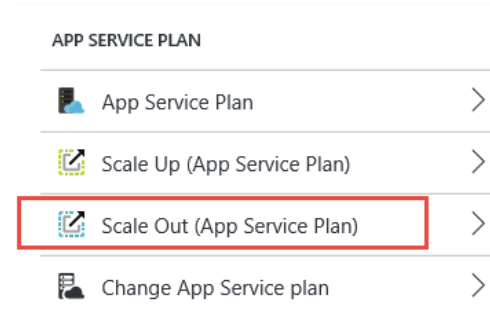
Description Create your own set of rules. Create a schedule that adjusts your instance counts based on time and performance metrics.

Monday-Friday Profile, scale 3 - 9

Settings CPU Percentage > 80 (increase count by 1)

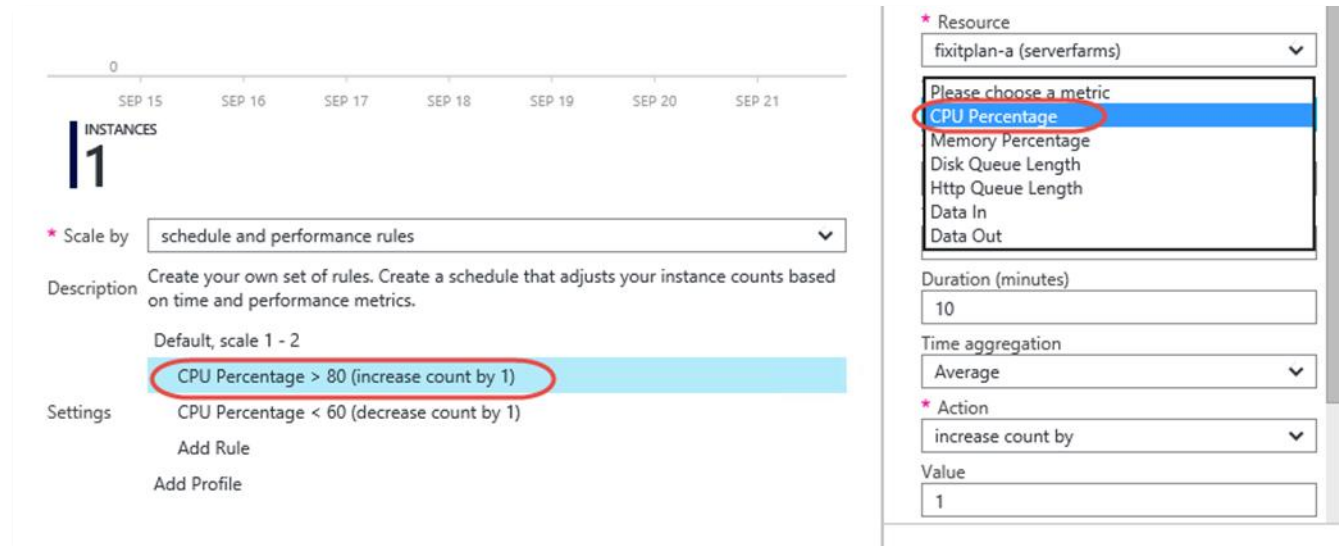
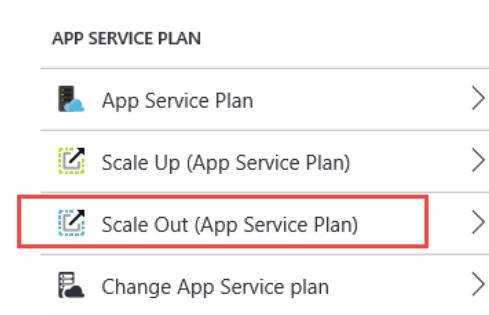
Azure App Service: Web App

- **Web App:** Scale Out Based on Triggers (CPU)



Azure App Service: Web App

- **Web App:** Scale Out To Multiple Instances (Trigger → CPU)



App Service Environment (ASE)

The ASE is a deployment of the Azure App Service into a subnet of a customer's Azure Virtual Network

The ASE provides:

- Network isolation for apps
- Larger scale than multi-tenant
- More powerful hosts
- Ability to work with all VPN types



App Service Environment (ASE)

- Geo Distributed Scale with App Service Environments
- Application scenarios which require very high scale can exceed the compute resource capacity available to a single deployment of an app.
- Example: Voting applications, sporting events, televised entertainment events etc.
- High scale requirements can be met by
 - Horizontally scaling out apps,
 - With multiple app deployments being made within a single region,
 - As well as across regions, to handle extreme load requirements.
- App Service Environments are an ideal platform for horizontal scale out.

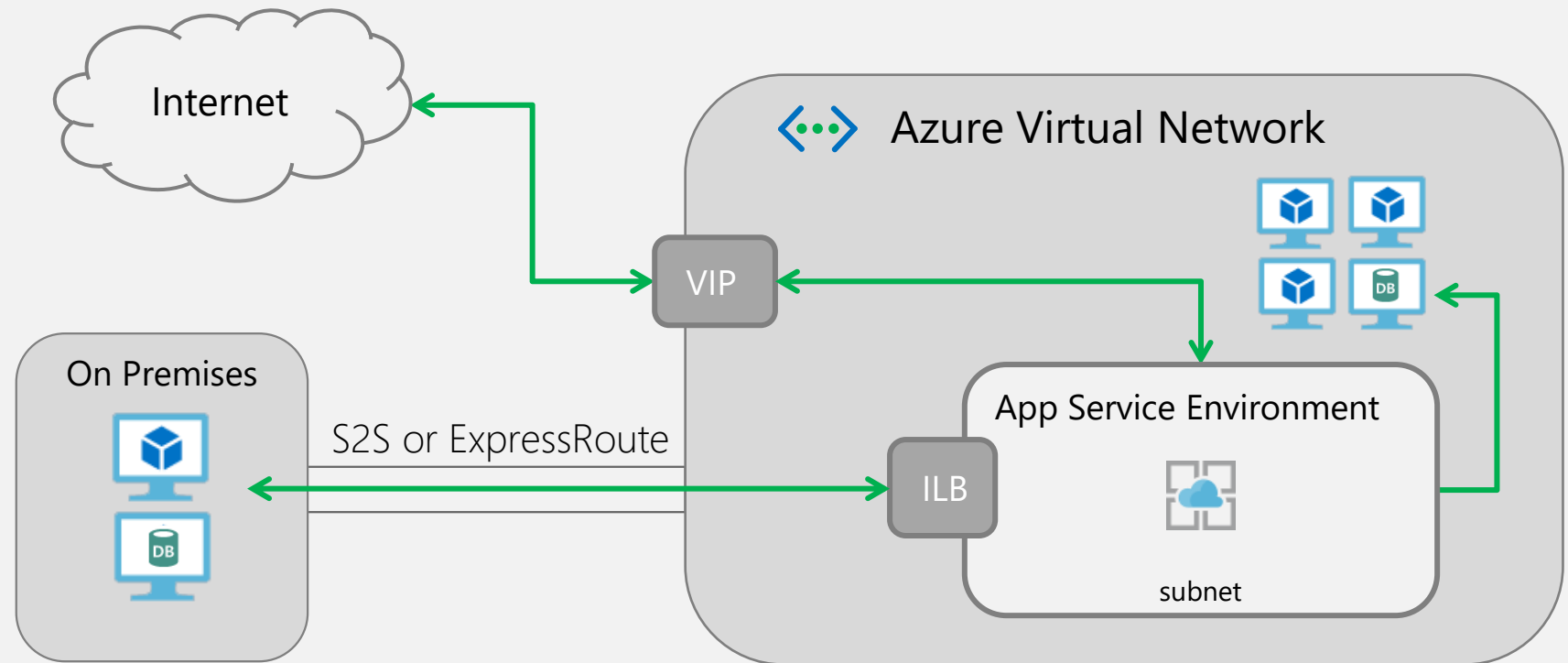


ASE

- ✓ Apps can be exposed to internet through VIP
- ✓ ASE is deployed into a subnet within customer VNET
- ✓ VNET can be peered to other Azure resources or back on-prem

ASE Networking

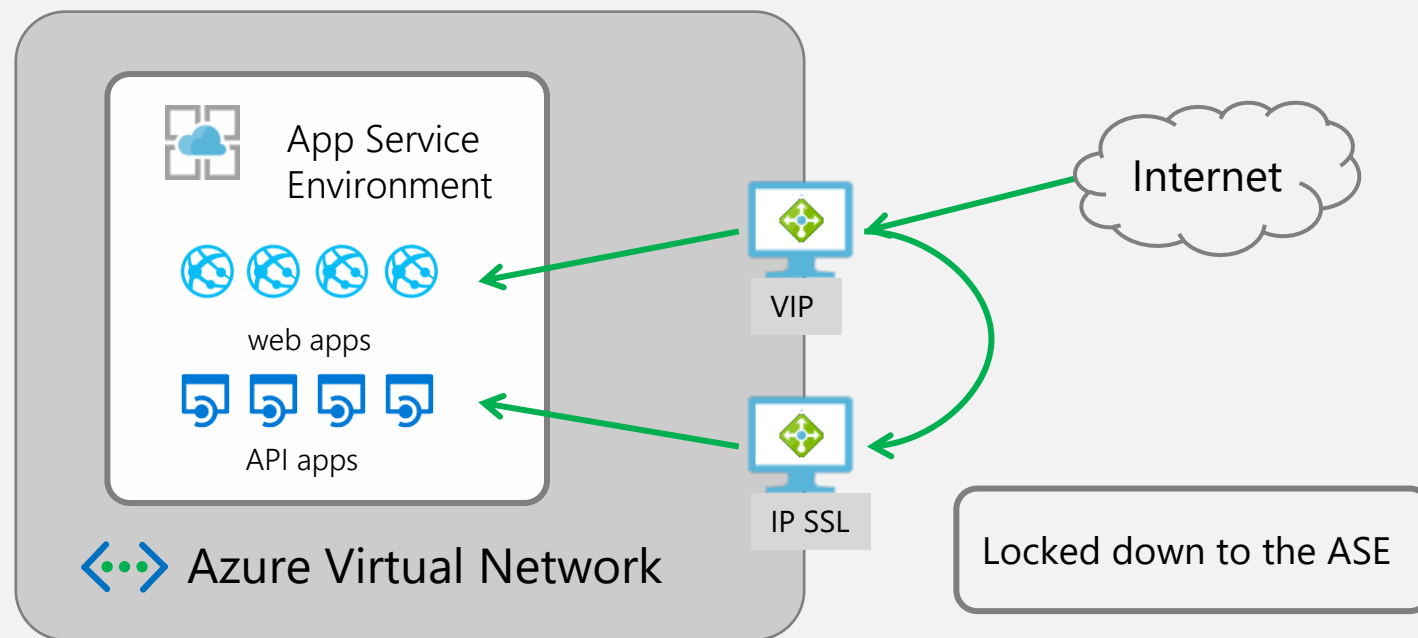
An ASE is a deployment of the Azure App Service into a subnet in a customer's Azure Virtual Network



ASE

- ✓ Public load balancer endpoint for accessing the web apps
- ✓ Use NSGs to lock down access to the app

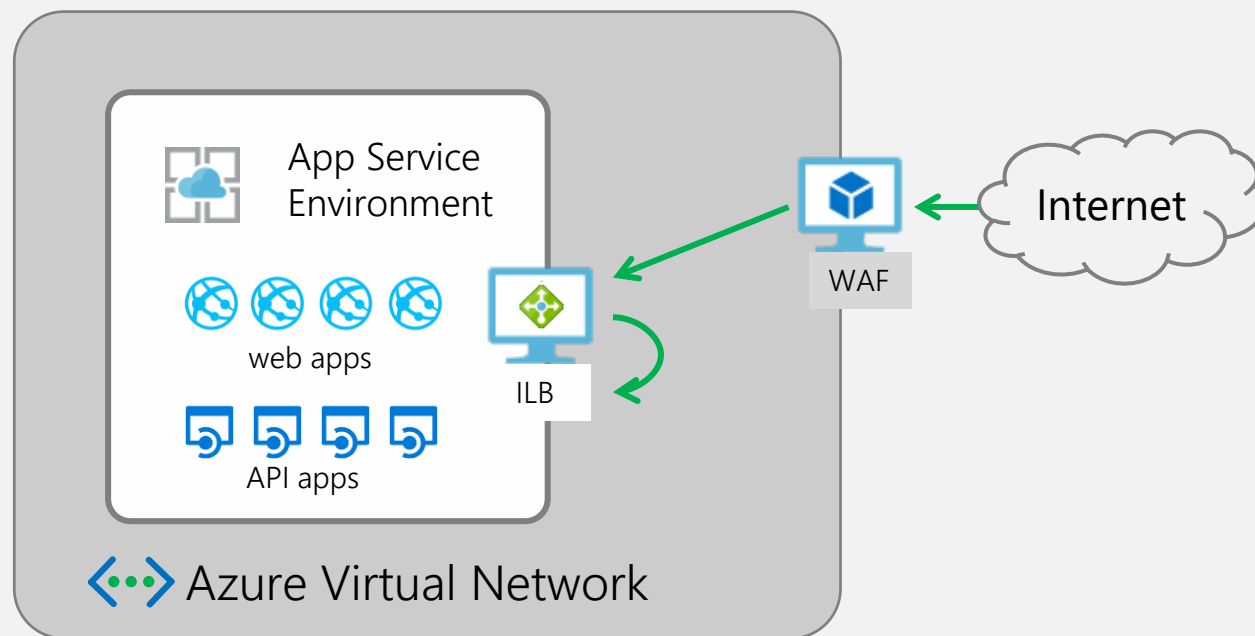
External ASE



ASE

- ✓ Protect public access with WAF functionality
- ✓ No public endpoints
- ✓ Traffic between web and APIs stays on VNET

ILB ASE with WAF

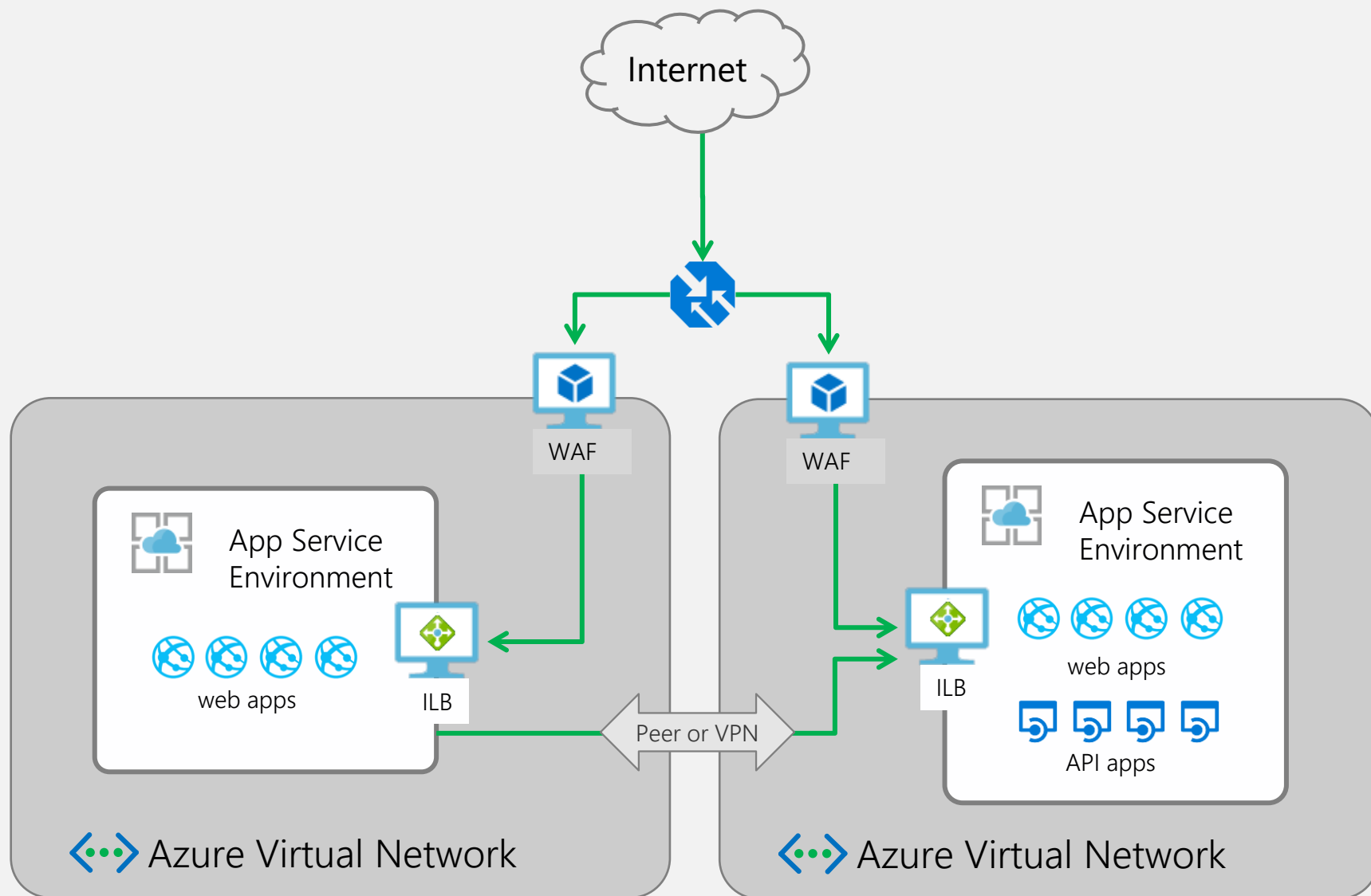




ASE

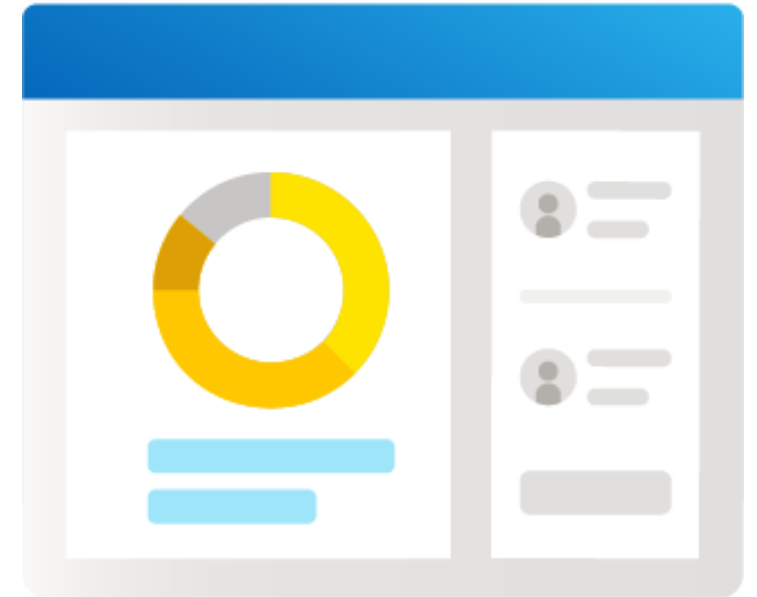
- ✓ Protect public access with WAF functionality
- ✓ No public endpoints
- ✓ Traffic between web and APIs stays on VNET
- ✓ Geo distributed traffic patterns to minimize latency and maximize redundancy

Geo Distributed ILB ASE



Demonstration

Create App Service Environment

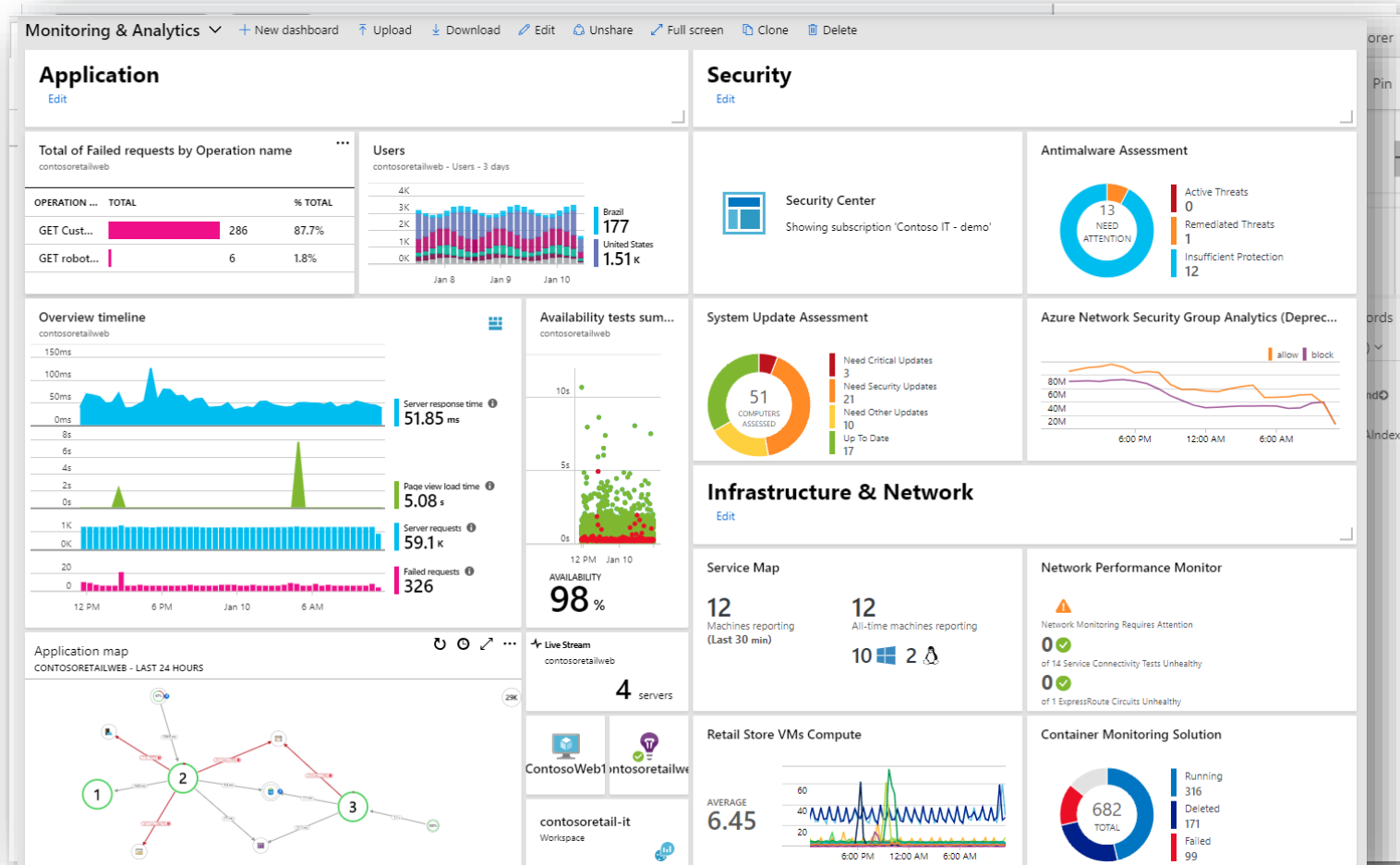


Monitoring

Azure Monitor Overview (Azure / Hybrid)



- Detect & diagnose issues across apps and dependencies with App Insights
- Correlate issues at infra level with Azure Monitor for VM, AKS, Storage, Network
- Operationalize at scale with Smart Alerts & Automated Actions
- Drill down with Log Analytics for troubleshooting & deeper diagnostics
- Create visualizations with Azure Dashboards & Workbooks



Monitoring & Diagnostics: Alerts

- **Metric values** –
 - The alert triggers when the value of a specified metric crosses a threshold you assign in either direction.
 - That is, it triggers both when the condition is first met and then afterwards when that condition is no longer being met.
- **Activity log events** –
 - An alert can trigger on *every* event, or, only when certain event occurs.
 - [Activity log alerts](#).

The screenshot displays the Azure Monitor 'Alert rules' interface. The left pane, titled 'Alert rules' for resource 'xcFixIt', shows a table of existing rules. The right pane, titled 'Add an alert rule', shows the configuration form. The 'Metric' dropdown is open, showing a list of metrics including 'Data In', 'Data Out', 'CPU Percentage', 'Disk Queue Length', 'Http Queue Length', and 'Memory Percentage'.

NAME	CONDITION	LAST ACTIVE
FIXITPLAN-A (SERVERFARMS)		
⊖ CPUHigh fixitplan-a	CPU Percentage > 90 Percent	Never
⊖ LongHttpQueue fixitplan-a	Http Queue Length > 100 Count	Never
XCFIXIT (COMPONENTS)		
You haven't created any alert rules.		
XCFIXIT (SITES)		
⊖ ForbiddenRequests xcFixIt	Http 403 > 0 Count	Never
⊖ ServerErrors xcFixIt	Http Server Errors > 0 Count	Never

Add an alert rule

* Resource ⓘ
fixitplan-a (serverfarms) ▼

* Name ⓘ

Description

Alert on
Metrics Events

* Metric ⓘ
Data In
Data Out
CPU Percentage
Disk Queue Length
Http Queue Length
Memory Percentage

Monitoring & Diagnostics: Web Server

- **Logging**

- **Detailed Error Logging**

- Detailed error information for HTTP status codes ≥ 400 .
 - Can help determine why server returned the error code.

- **Failed Request Tracing (IIS FREB)**

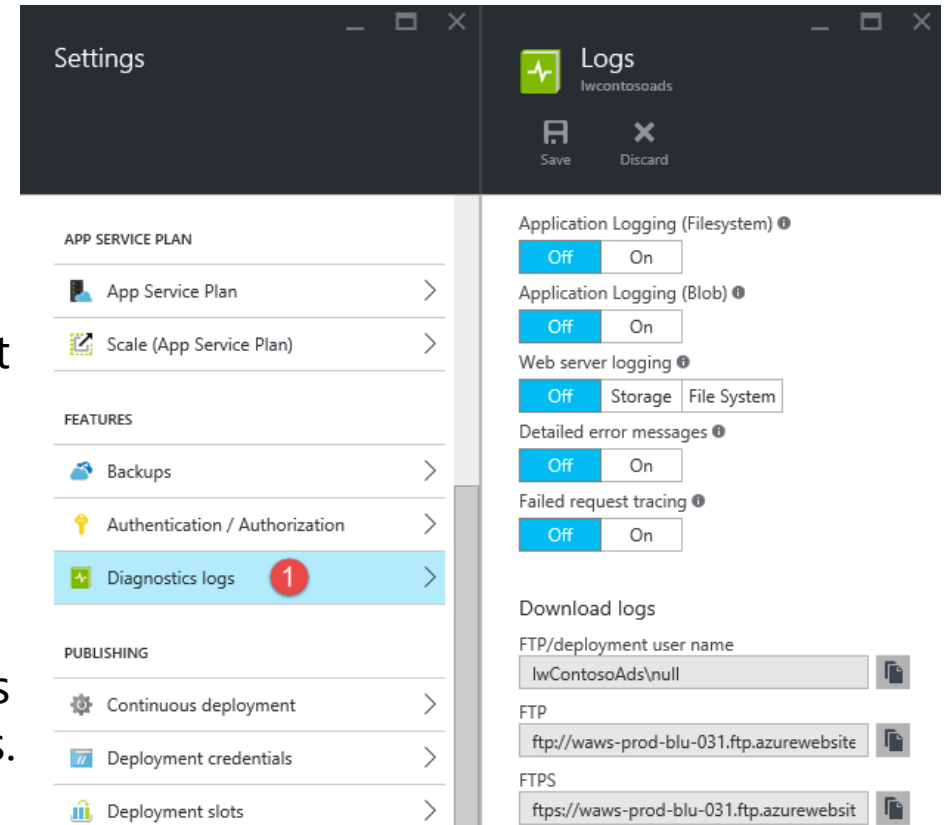
- Includes trace of IIS components used to process the request & time taken in each component.
 - Useful for problem isolation or performance tuning.

- **Web Server Logs (say IIS Logs)**

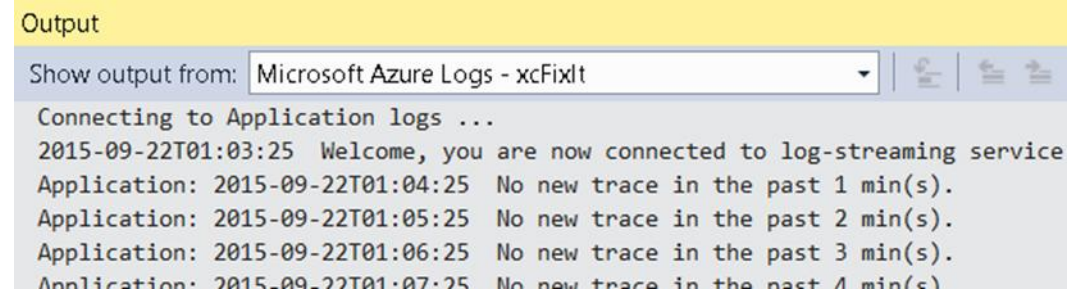
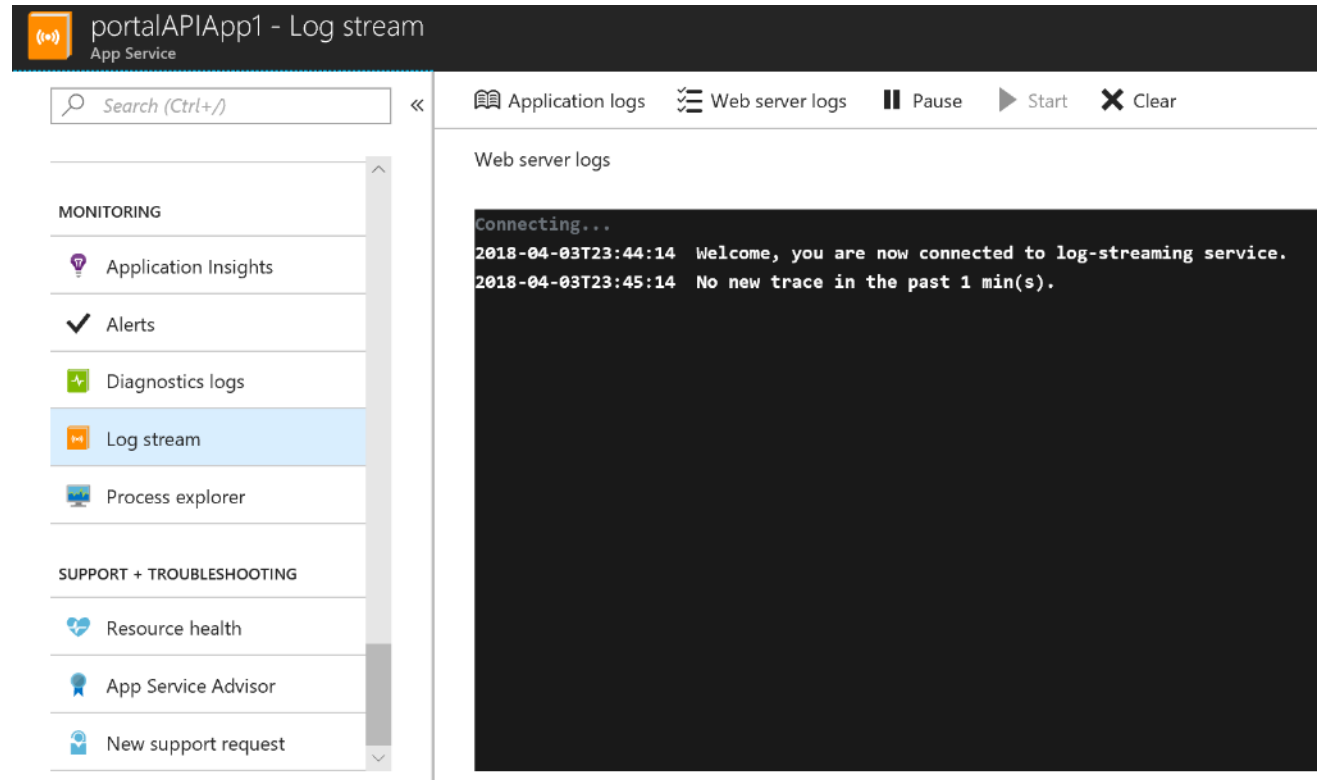
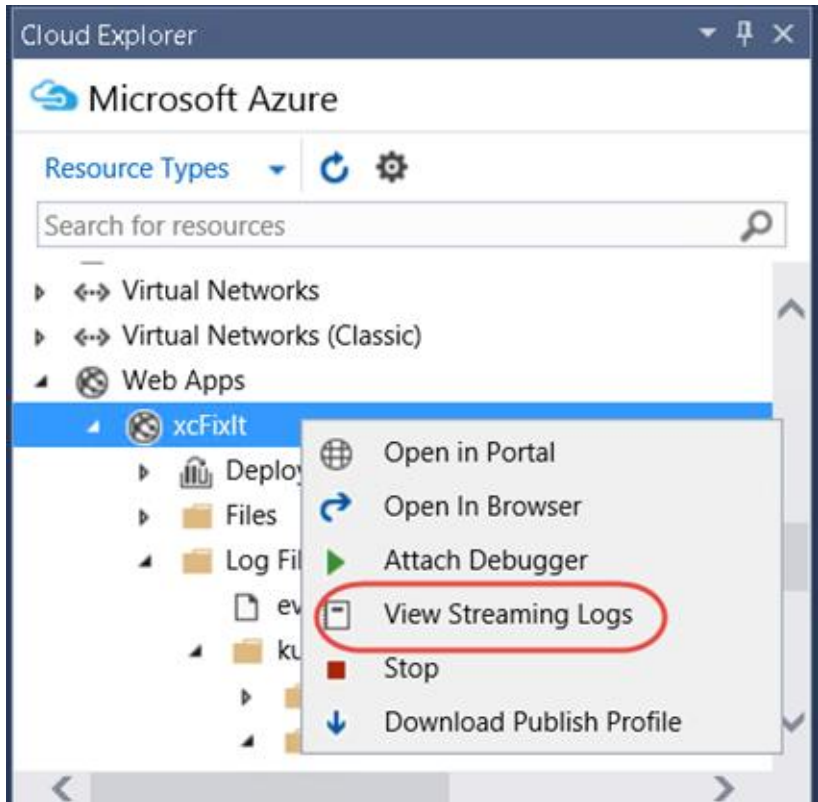
- HTTP transactions using the [W3C extended log file format](#).
 - Useful for overall site metrics such as the number of requests handled or how many requests are from a specific IP address.

- Web App: Log Streaming

- Azure Portal → Your Web App → Settings → Diagnostics Logs



Web App: Diagnostics Logs



Module 1 Labs

Lab 1: Create ASE

Exercise 1: Create a Resource Group

Exercise 2: Create a Virtual Network

Exercise 3: Create a ILB App Service Environment v3

Questions?