

Azure App Service

Application Architecture	VMs - Azure Virtual Machines	ACI - Azure Container Instances	Azure App Service (w-w/o containers)	AKS - Azure Kubernetes Services	Azure Functions	Azure Batch
Web apps (Monolithic)	✓	✓	✓	✓		
N-Tier apps (Services)	✓	✓	✓	✓	✓	
Cloud-Native (Microservices)		✓		✓ (Linux containers)	✓ (Event-driven)	
Batch/Jobs (Background tasks)	✓	✓	✓	✓	✓ (Background tasks)	✓ (Large-scale)

Legend



Choosing Azure compute platforms







































Balance of responsibility

Balance of control and responsibility depends on the category of the service

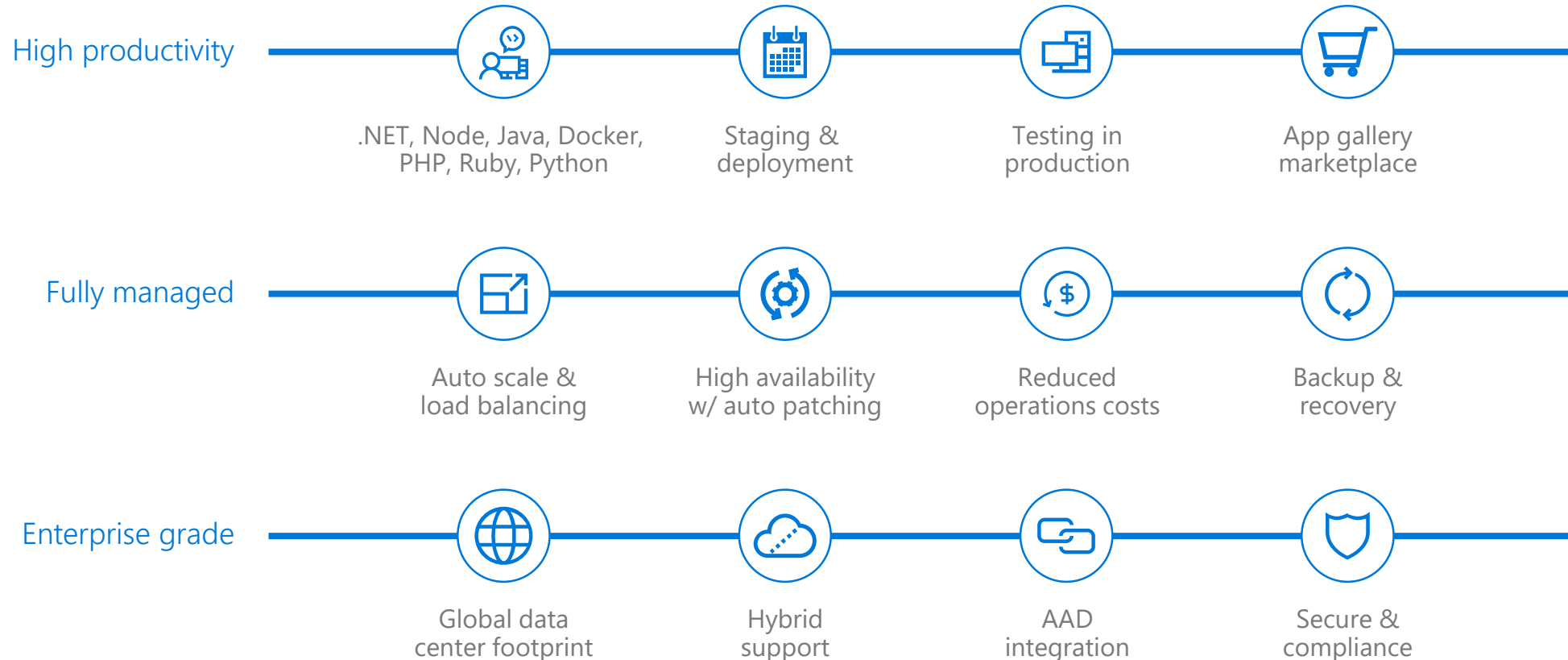
SaaS: Move-in ready
Use immediately with minimal configuration

PaaS: Some assembly required
Existing services are a starting point, with additional configuration for a custom fit

IaaS: Build from the ground up
Building blocks, create your own solution or apps from scratch

Responsibility	On Prem	IaaS	PaaS	SaaS
Applications				
Data				
Runtime				
Middleware				
Operating system				
Virtualization				
Servers				
Storage				
Networking				
<div> Customer Microsoft</div>				

Azure App Service



550K active customers

1.7M apps & sites hosted

>20B requests per day



App Service features & capabilities

High productivity

Remote debugging with Visual Studio
Site staging slots
Testing in production
Continuous integration/deployment
Git, Visual Studio, Docker Hub, and GitHub
App and site diagnostics
OS and framework patching
Site extensions gallery
NET, PHP, Python, Node, Ruby, Java
Framework installer
Browser-based editing
Auto-healing
Logging and auditing
Admin-site
Support site extension
Remote debugging

Fully managed

Automated deployment
AutoScale
Built-in load balancing
WW datacenter coverage
End point monitoring and alerts
App gallery
DR site support
Wildcard support
Dedicated IP address
HTTP compression
CDN support for websites
Premium WordPress
App Services Environments

Enterprise grade

Hybrid connections/VPN support
Scheduled backup
Azure Active Directory Integration
Site resiliency, HA, and DR
Web jobs
Role base access control
Audit/compliance
Enterprise migration
Client certs
Cache
IP restrictions/SSL
Web sockets
SQL, MySQL, DocDB, and Mongo
Sticky sessions
Authorization/authentication
MSI

Fully managed

App Service takes care of the plumbing so you can focus on business logic



Auto-scale & load balancing



High availability with auto patching



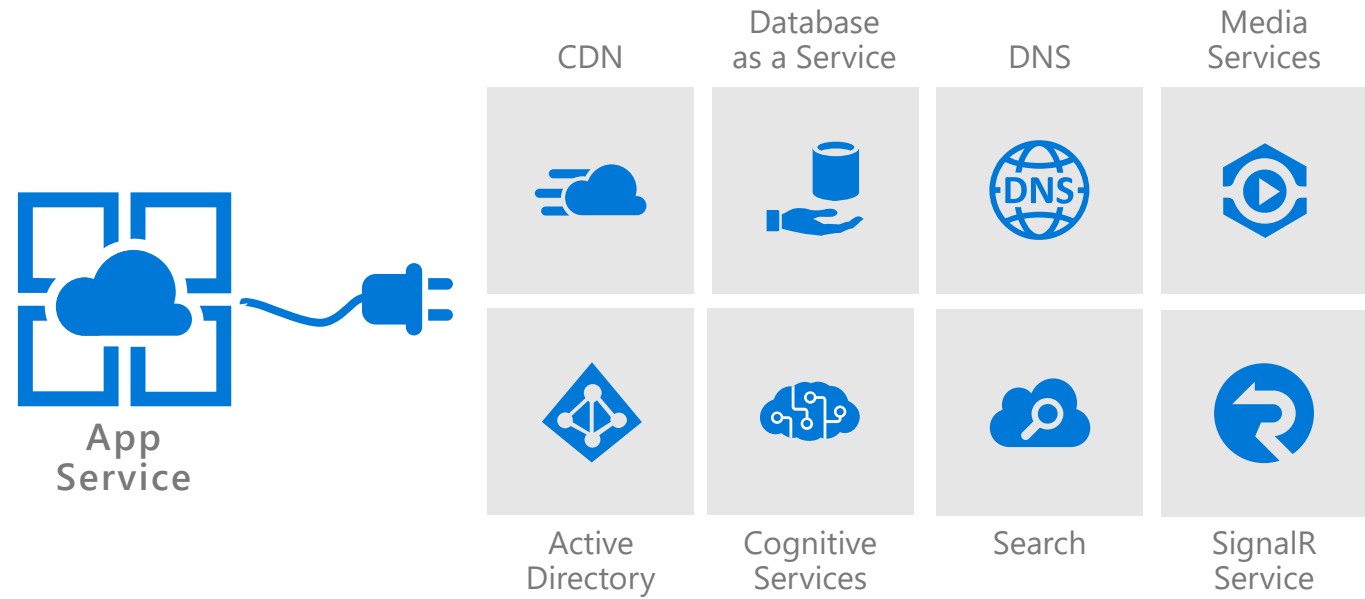
Reduced operations costs



Backup & recovery

Fully managed

Easily connect to other managed services to meet specific web app needs



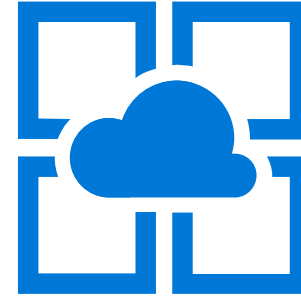
Enterprise grade

Get the control you want with a variety of hosting options



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. App Service on Azure Stack brings the power of Azure App Service to your own data centers.

Enterprise grade

Get the control you want with a variety
of hosting options



50 data centers
worldwide



Industry-verified
compliance



Managed Service
Identity support



Azure Virtual
Network integration

Digital marketing websites

Enable global campaigns, digital events, and rich customer communications

Developers

Deliver fast, fluid app experiences



Push out feature updates quickly



Integrate with the CMS you love



Go social, simplify sign-in/up process

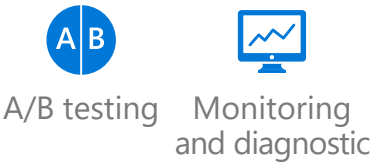


Technical Leaders

Reach global users at scale smoothly



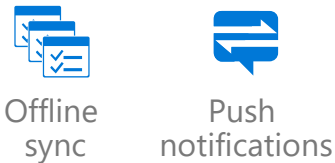
Transform products through data driven approach



Engage users with rich media

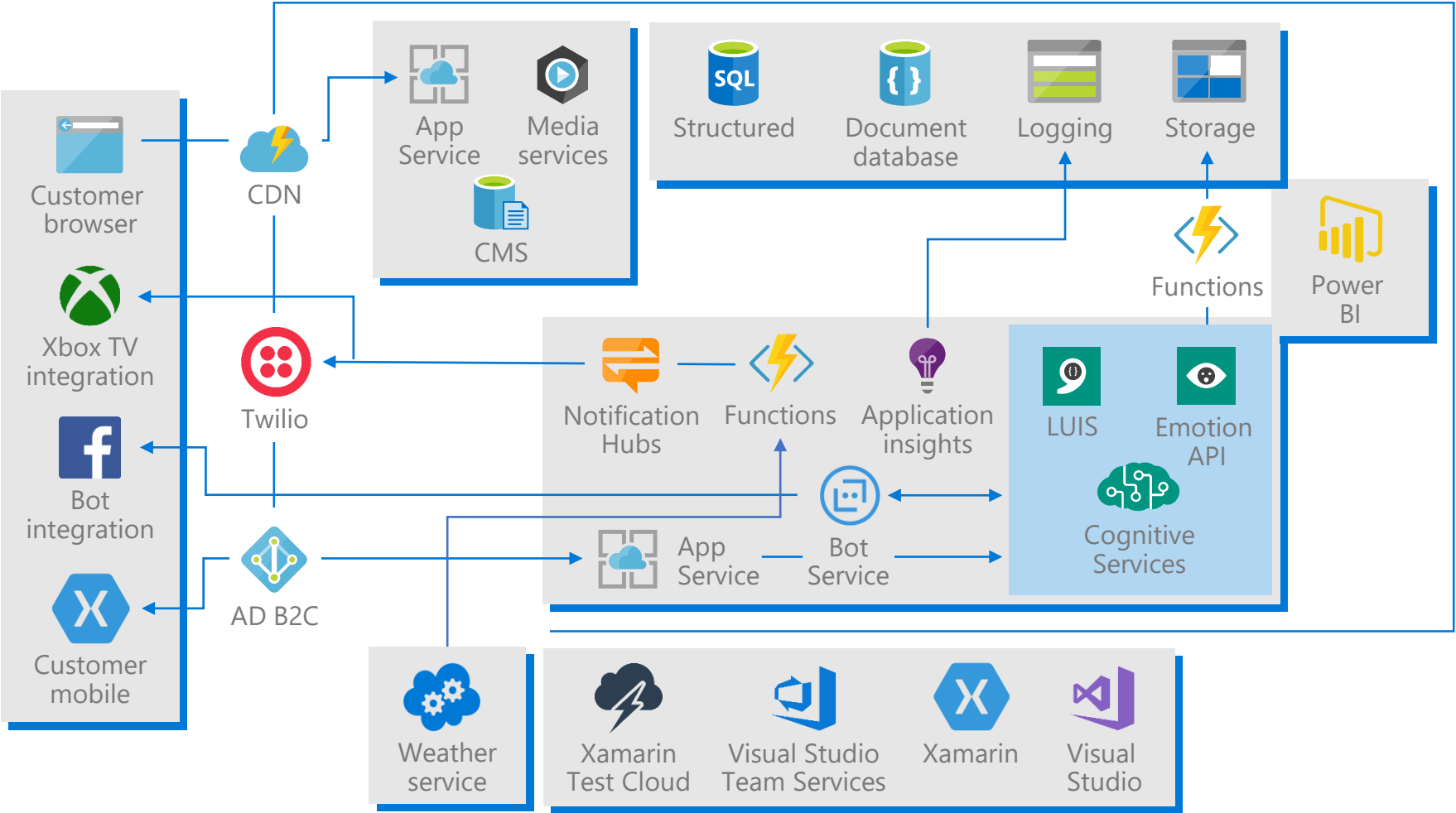


Deliver x-platform experiences w/ minimal development redundancy



Branded website

with personalized experience and mobile notifications



Transactional apps

Deliver personalized, scalable, and secure transactional experience

Developers

Deliver fast, fluid app experiences



High availability



Backup & restore

Push out feature updates quickly



SCC integration and CI/CD



Staged deploy with slots

Connect to enterprise systems or on-premises resources



VNET integration



Express routes



Logic Apps

Simplify B2C and B2B sign-on process



Easy authentication

Technical Leaders

Handle peak load and traffic seasonality



Redis cache



Auto scale on demand

Transform products through data driven approach



A/B testing



Monitoring and diagnostic

Secure critical customer and company information



WAF



App Service Environment



VPN support

Deliver x-platform experiences w/ minimal development redundancy



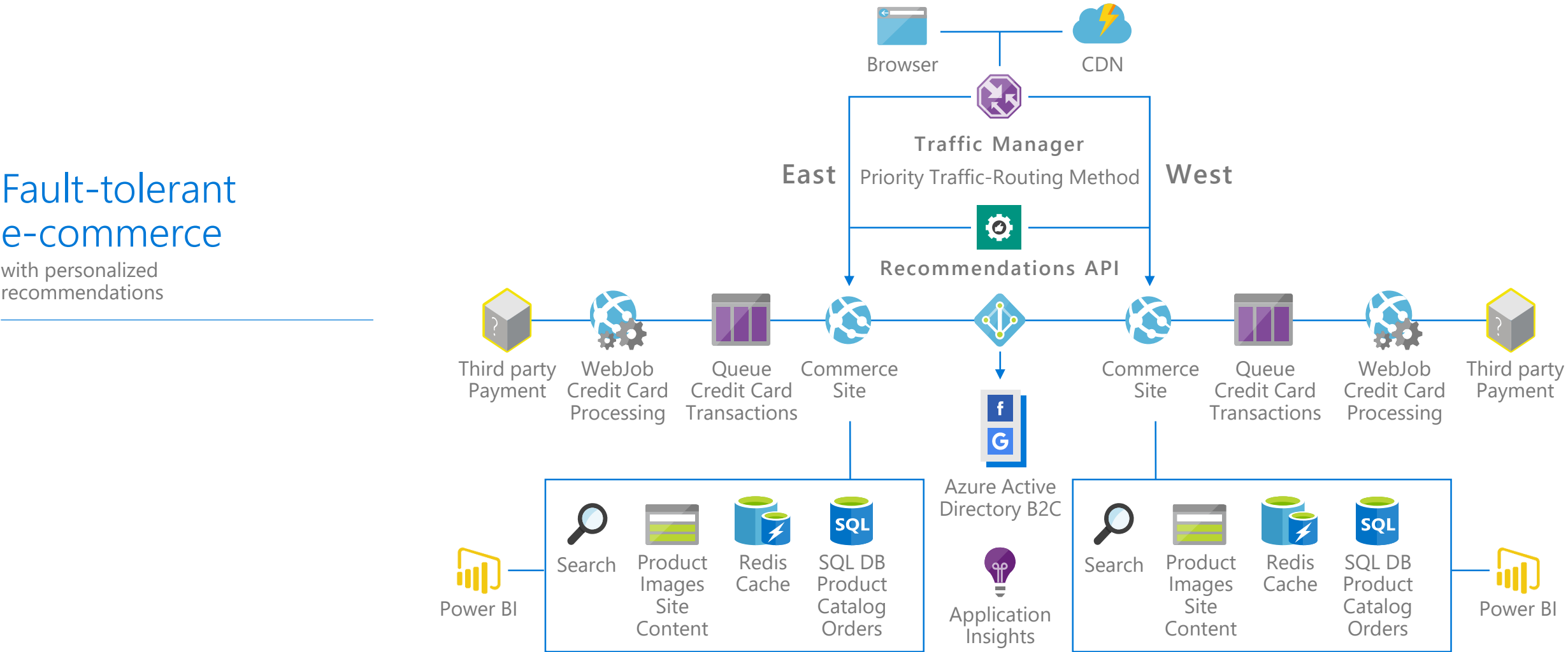
Offline sync



Push notifications

Fault-tolerant e-commerce

with personalized recommendations



Modern LOB apps

Enhance existing enterprise apps with modern experience and capabilities

Developers

Deliver reliable app experiences



High availability



Backup & restore

Leverage existing, on-premises data



Express routes



VNET integration

Connect to business processes



API Management



Logic App

Simplify corporate identity integration



SSO



Corporate AAD

Technical Leaders

Supports global footprint for market expansion



Global scale



Clone

Reduce costs of supporting old application hardware



Auto patching



Monitoring and diagnostic

Secure critical company data and information



VPN support



WAF



App Service Environment

Enable mobile workforce while minimizing development redundancy



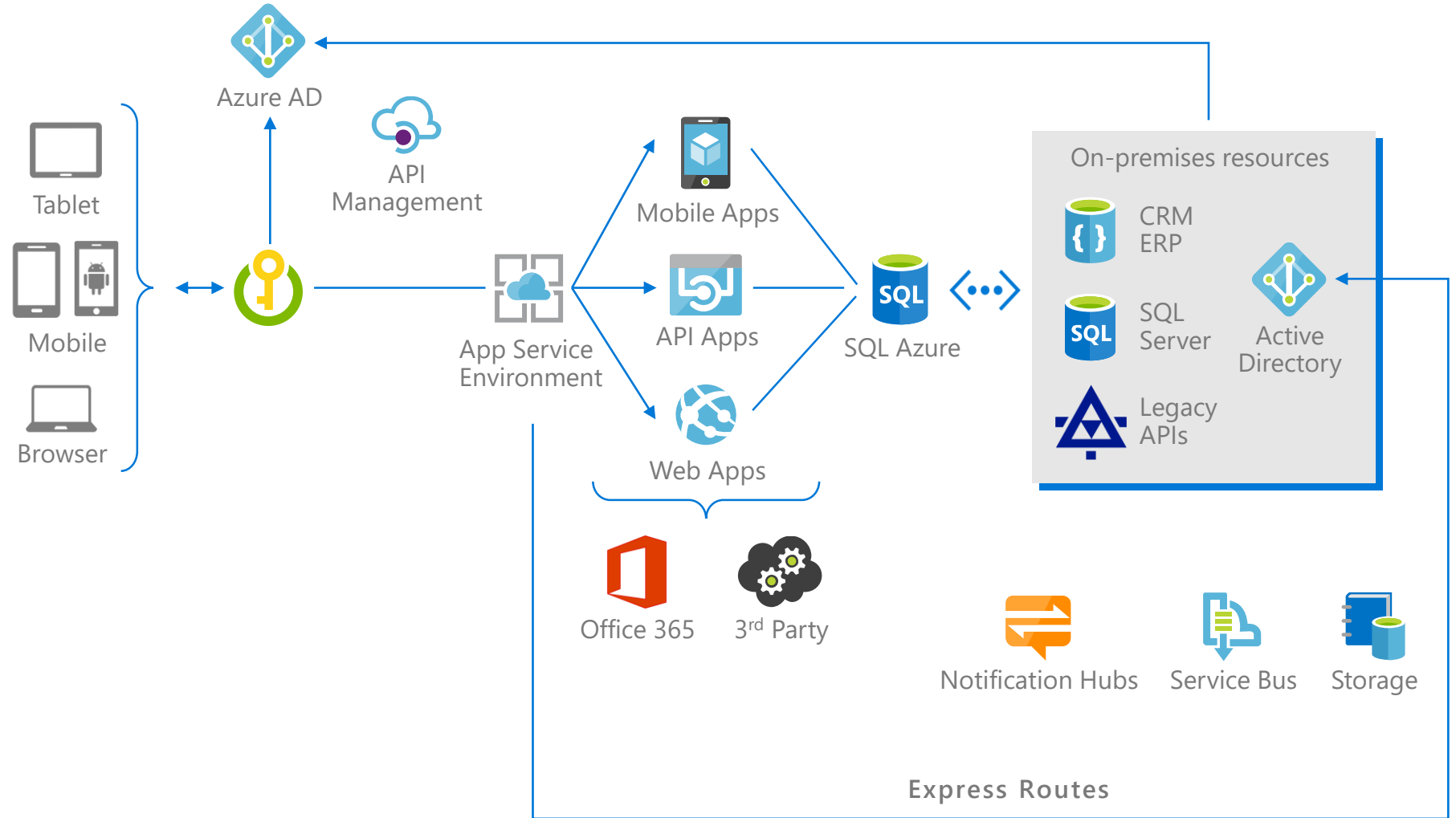
Offline sync



Push notifications

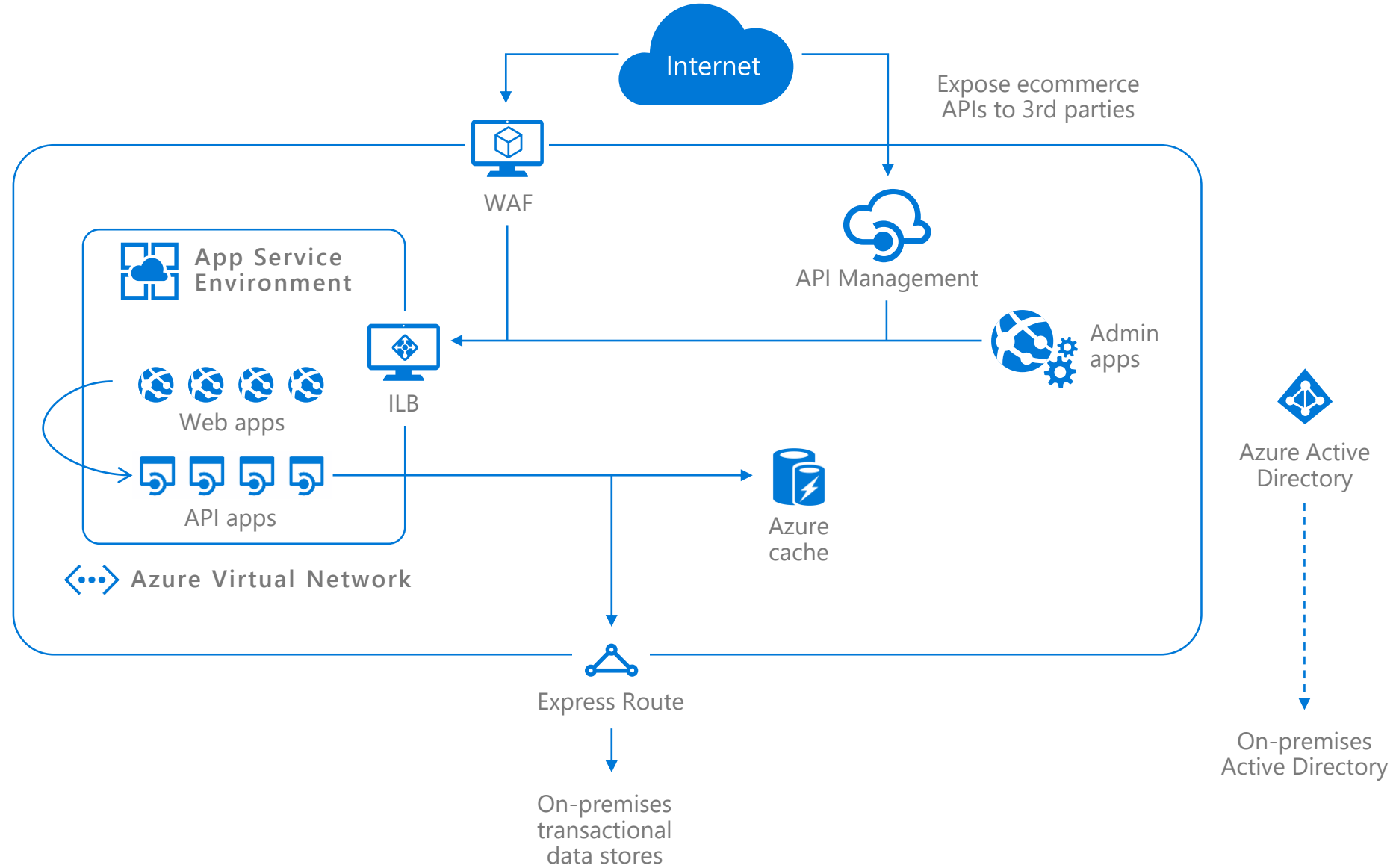
Line of business app

with VPN and access to on-premises resources



E-commerce app

with scalable and secure architecture



Multi-tier app

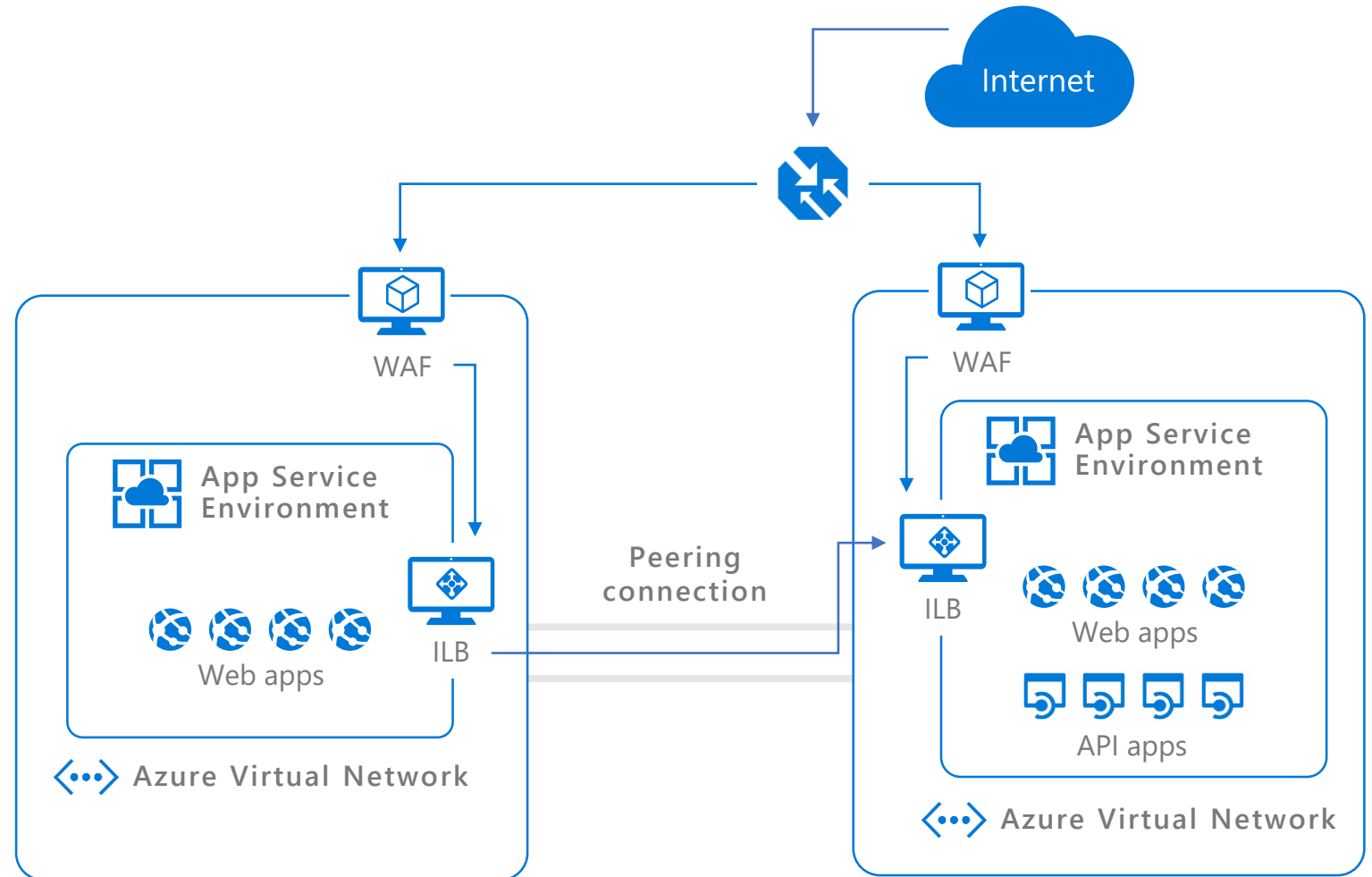
based on ILB ASE with geo distribution

Use NSGs to lock down access to user facing app

Use ILB ASE to enhance network access security

Add Web Application Firewall virtual device for extreme app security

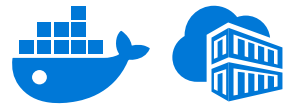
Use Traffic Manager to distribute load geographically



Web app for containers

Easily deploy and run container-based web apps at scale

Accelerated outer loop



Tight integration w/
Docker Hub, Azure
Container Registry



Built-in CI/CD w/
Deployment Slots

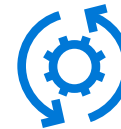


Intelligent diagnostics
& troubleshooting,
remote debugging

Fully managed platform



Automatic scaling
and load balancing



High availability
w/ auto-patching



Backup &
recovery

Flexibility & choices



From CLI, portal, or
ARM template

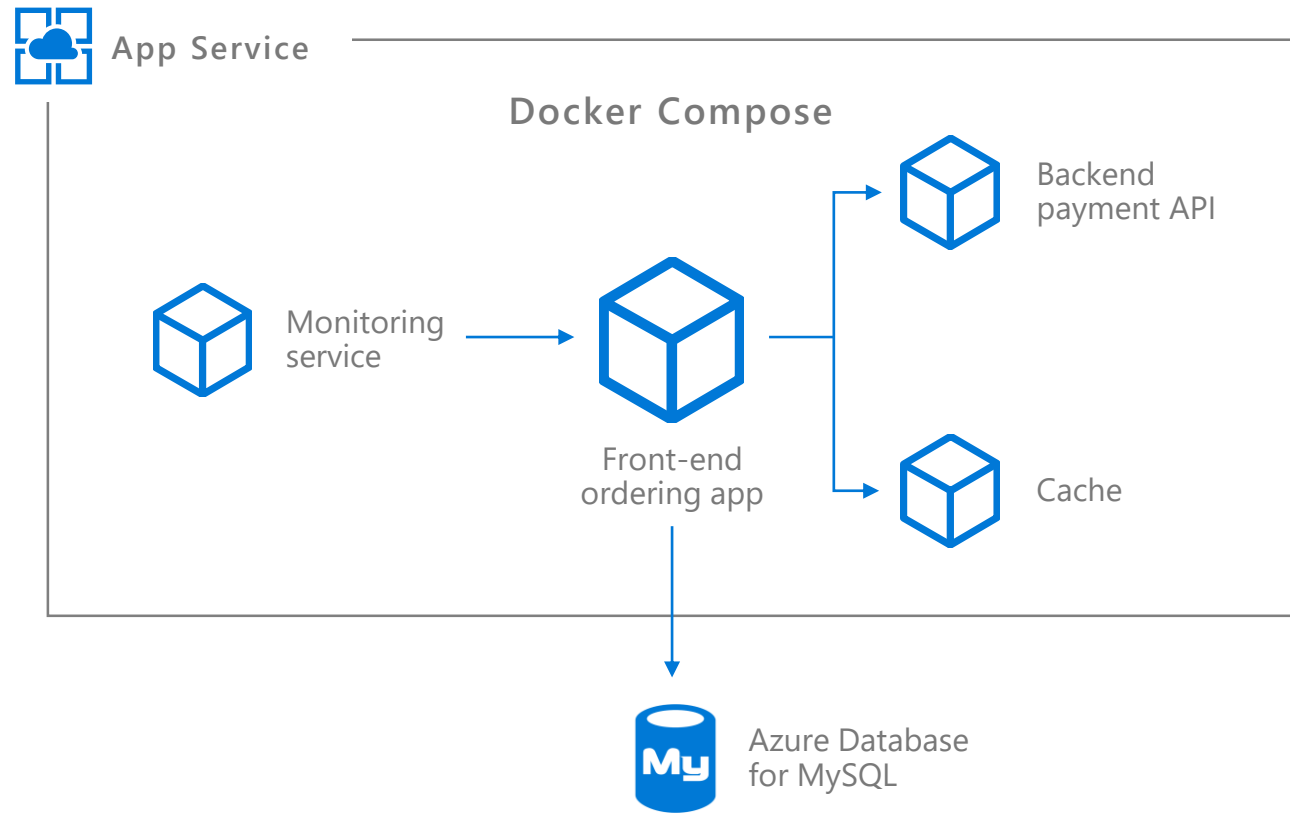


Single Docker image, multi
container w/ Docker compose,
or Kubernetes Pod Definition

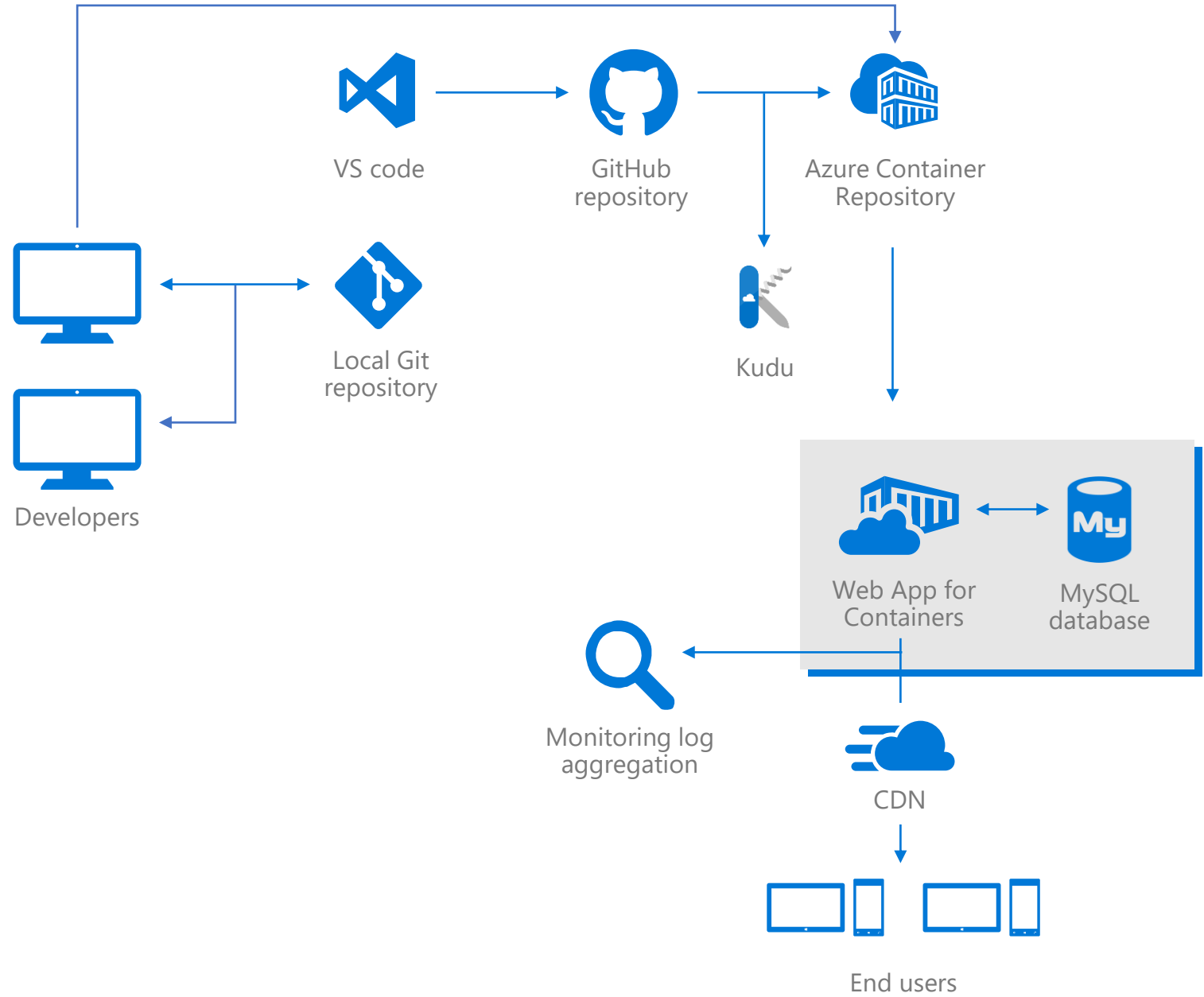


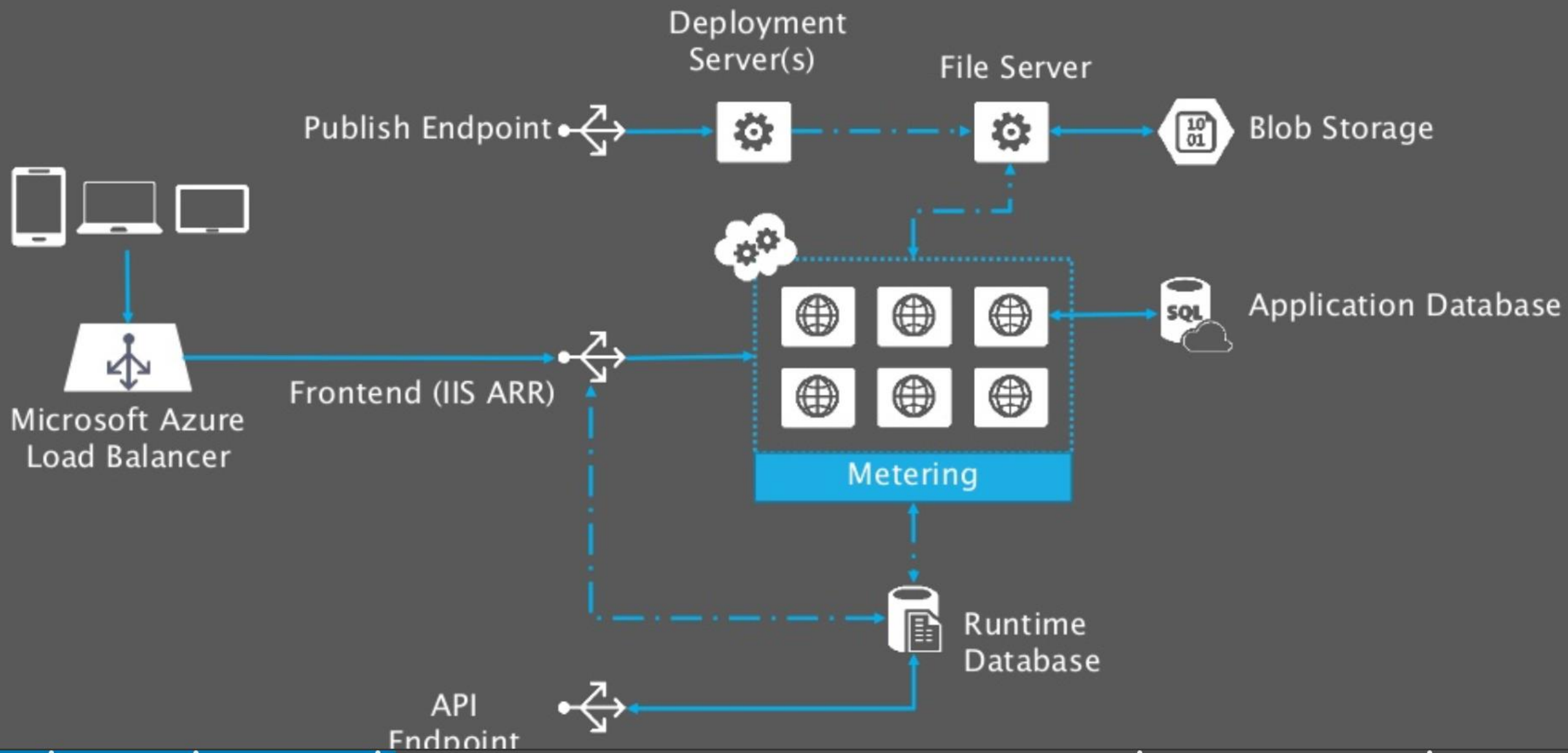
IntelliJ, , Jenkin, Maven
Visual Studio family

Multi-container sample architecture



Sample architecture





Web App

- **Multiple languages and frameworks** - ASP.NET, ASP.NET Core, Java, Ruby, Node.js, PHP, or Python. You can also run [PowerShell and other scripts or executables](#) as background services.
- **DevOps optimization** - Set up [continuous integration and deployment](#) with Visual Studio Team Services, GitHub, BitBucket, Docker Hub, or Azure Container Registry.
- **Global scale with high availability** - Scale [up](#) or [out](#) manually or automatically.
- **Connections to SaaS platforms and on-premises data** - Choose from more than 50 [connectors](#) for enterprise systems (such as SAP), SaaS services (such as Salesforce)
- **Security and compliance** - App Service is [ISO, SOC, and PCI compliant](#).
- **Application templates** - Choose from an list of application templates in the [Azure Marketplace](#), such as WordPress, Joomla, and Drupal.
- **API and mobile features** - turn-key CORS support for RESTful API scenarios, and simplifies mobile app scenarios by enabling authentication, offline data sync, push notifications, and more.
- **Serverless code** - Run a code snippet or script on-demand and pay only for the compute time your code actually uses

App Service Plan

- Defines a set of compute resources Region (West US, East US, etc.)
 - Number of VM instances
 - Size of VM instances (Small, Medium, Large)
 - Pricing tier (Free, Shared, Basic, Standard, Premium, PremiumV2, Isolated, Consumption)
- Multiple apps can run inside an App Service Plan
- Consider separate App Service Plans when
 - The app is resource-intensive.
 - You want to scale the app independently from the other apps the existing plan.
 - The app needs resource in a different geographical region

OS functionality available to App Service “sandbox”

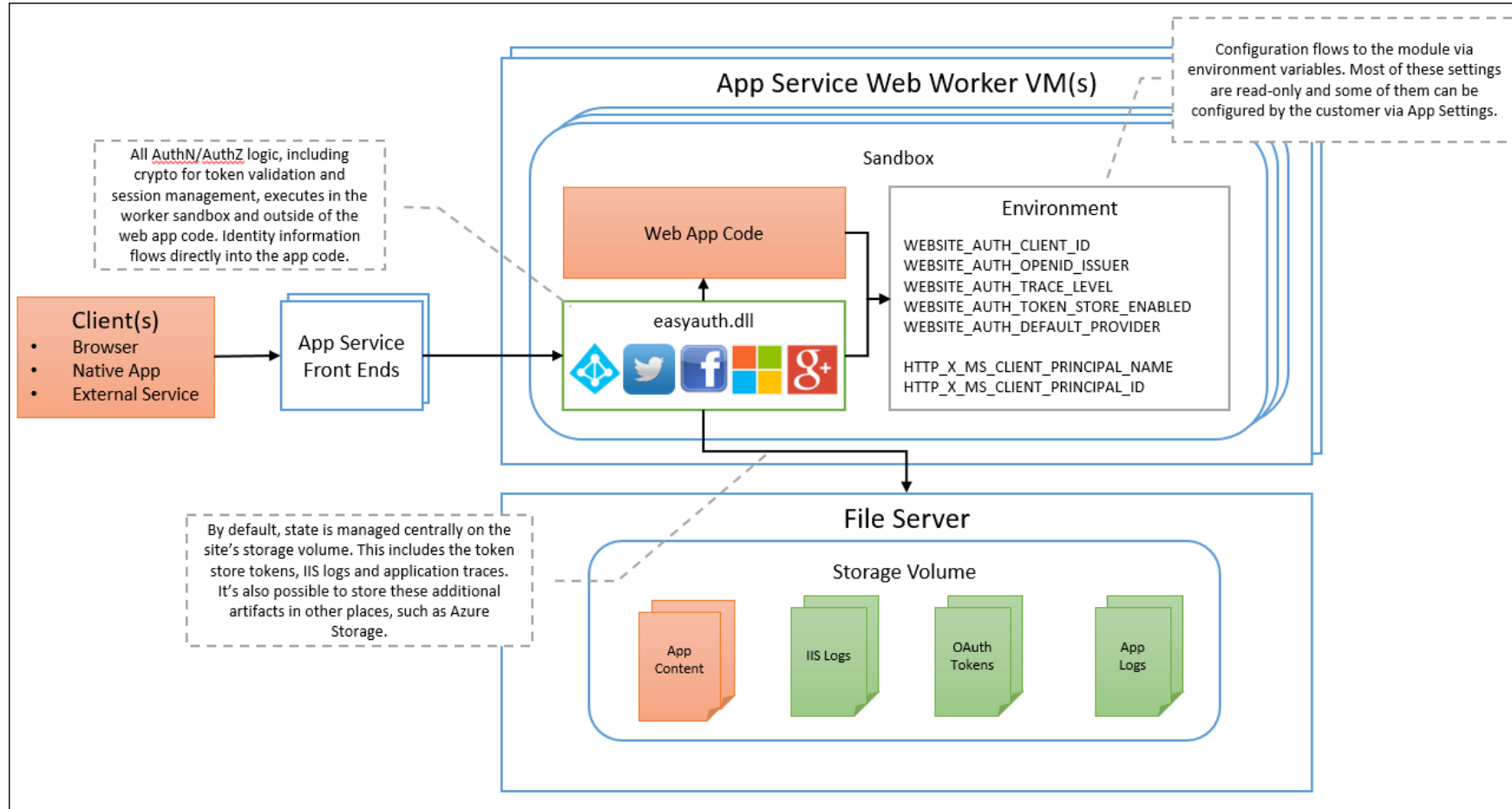
- Read access to registry
- Virtualized Event Log
- User32 / GDI 32
- Restricted access to the file system
 - D:\home
 - D:\local
- HTTP and HTTPS
 - Two processes within the same app can talk over sockets
- Frameworks like Syncfusion, Siberix may not work

<https://github.com/projectkudu/kudu/wiki/Azure-Web-App-sandbox>

App Service Shared Networking

- Except the Isolated Tier (we will talk about it next)
- Apps share network infrastructure
- Regardless of the number of instances you get a single inbound
 - You can get a Static IP via IP SSL Binding
- Set of outbound IPs (for an outbound connection to the SQL)
- Outbound IPs can change when scale up and down

Authentication and Authorization



Identity Providers

Provider	Sign-in endpoint
Azure Active Directory	/.auth/login/aad
Microsoft Account	/.auth/login/microsoft
Facebook	/.auth/login/facebook
Google	/.auth/login/google
Twitter	/.auth/login/twitter

Enabling Auth

The screenshot displays the Azure portal interface for configuring Authentication / Authorization on an App Service. The breadcrumb trail at the top indicates the path: Home > Resource groups > myAuthResourceGroup > dotnet-core-back-end - Authentication / Authorization. The left-hand navigation pane shows various settings, with 'Authentication / Authorization' highlighted by a red box. The main content area features a 'Save' button and a 'Discard' button. A blue information icon provides a note: '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"'. Below this, the 'App Service Authentication' section shows the 'On' toggle selected, also highlighted with a red box. The 'Action to take when request is not authenticated' dropdown menu is set to 'Log in with Azure Active Directory', which is also highlighted with a red box. The 'Authentication Providers' section lists three providers: 'Azure Active Directory' (Not Configured), 'Facebook' (Not Configured), and 'Google' (Not Configured). The 'Azure Active Directory' entry is highlighted with a red box, and a red arrow points to its configuration link.

Home > Resource groups > myAuthResourceGroup > dotnet-core-back-end - Authentication / Authorization

dotnet-core-back-end - Authentication / Authorization
App Service

Search (Ctrl+ /)

Continuous Delivery (Preview)

SETTINGS

- Application settings
- Authentication / Authorization**
- Managed service identity
- Backups
- Custom domains
- SSL certificates
- Networking
- Scale up (App Service plan)
- Scale out (App Service plan)
- WebJobs

Save Discard

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

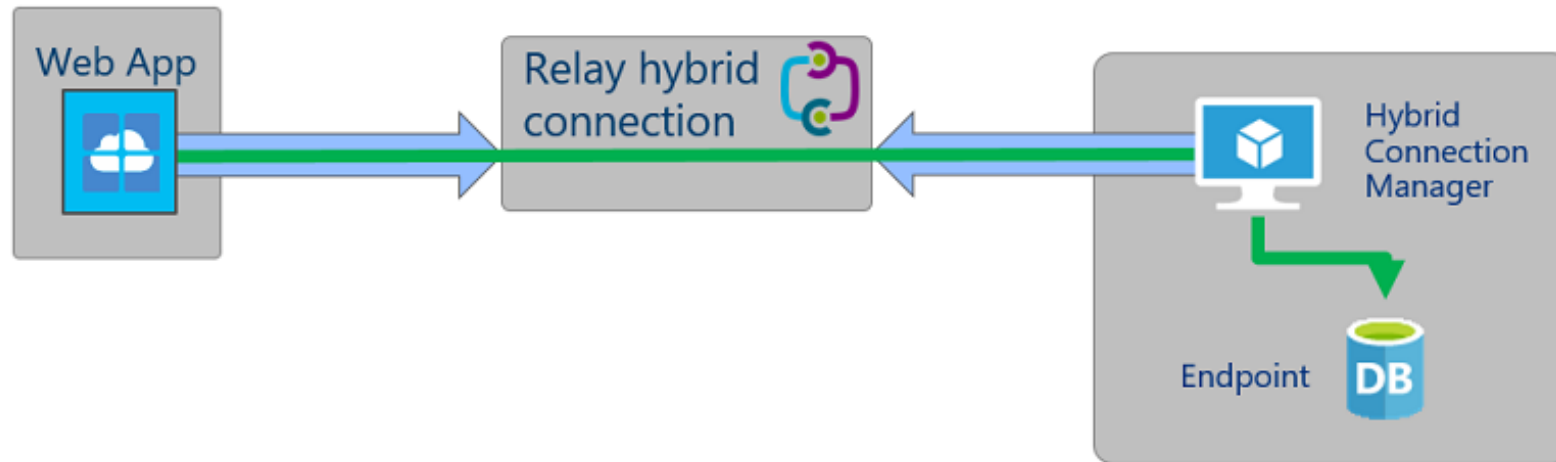
Authentication Providers

Azure Active Directory	Not Configured	>
Facebook	Not Configured	>
Google	Not Configured	>

Auth Flow

Step	Client Side Flow	Server Side Flow
1. Sign user in	Redirects client to /.auth/login/<provider>.	Client code signs user in directly with provider's SDK and receives an authentication token. For information, see the provider's documentation.
2. Post-authentication	Provider redirects client to /.auth/login/<provider>/callback.	Client code posts token from provider to /.auth/login/<provider> for validation.
3. Establish authenticated session	App Service adds authenticated cookie to response.	App Service returns its own authentication token to client code.
4. Serve authenticated content	Client includes authentication cookie in subsequent requests (automatically handled by browser).	Client code presents authentication token in X-ZUMO-AUTHheader (automatically handled by Mobile Apps client SDKs).

Hybrid Connections



Local Cache

- Web App Content inside an App Service is shared
 - Stored in Azure Storage
 - Durable
 - Log and Data files are placed under the same content folder
 - Changing the content was cause a restart.
- Web apps requiring high-performance can
 - Cache this content locally (enable local cache up to 2 GB)
 - Immune to content changes
 - D:\Home will now point to local cache

Diagnostics

The screenshot shows the 'BuggyBakery - Diagnose and solve problems' interface. The left sidebar contains navigation links for Overview, Activity log, Access control (IAM), Tags, Diagnose and solve problems (selected), and various deployment and settings options. The main content area features a 'Home' tab with five status buttons: Web App Down, Web App Slow, High CPU Usage, High Memory Usage, and Web App Restarted. A chatbot interface is active, asking to perform a health check. Below the chatbot, there are tabs for Requests and Errors, App Performance, CPU Usage, and Memory Usage. The 'Requests and Errors' tab is selected, showing a line graph of request counts over time. The right sidebar lists support tools, premium tools, FAQs, and a resource center.

BuggyBakery - Diagnose and solve problems

Search (Ctrl+/)

Overview

- Activity log
- Access control (IAM)
- Tags
- Diagnose and solve problems**

DEPLOYMENT

- Quickstart
- Deployment credentials
- Deployment slots
- Deployment options
- Continuous Delivery (Preview)

SETTINGS

- Application settings
- Authentication / Authorization
- Managed service identity
- Backups
- Custom domains
- SSL certificates
- Networking
- Scale up (App Service plan)

Home

Web App Down Web App Slow High CPU Usage High Memory Usage Web App Restarted

First, would you like me to perform a health checkup on your Web App?

A health checkup analyzes your Web App and gives you a quick and in-depth overview of your app health according to requests and errors, app performance, CPU usage, and memory usage.

Yes, please perform a health checkup on my Web App.

Great, give me a moment while I perform your health checkup...

Once your health checkup is complete, please use the tabs to navigate between the different categories. Click 'View Full Report' to get more details and potential quick solutions and troubleshooting advice.

Requests and Errors App Performance CPU Usage Memory Usage

Request Count

Legend: Requests (blue), Http 2xx (green), Http 3xx (purple), Http 4xx (orange), Http Server Errors (red)

SUPPORT TOOLS

- Metrics per Instance (Apps)
- Metrics per Instance (App Service Plan)
- Live HTTP Traffic
- Application Events
- Failed Request Tracing Logs
- Diagnostics as a Service
- Mitigate
- Advanced Application Restart

PREMIUM TOOLS

FAQs

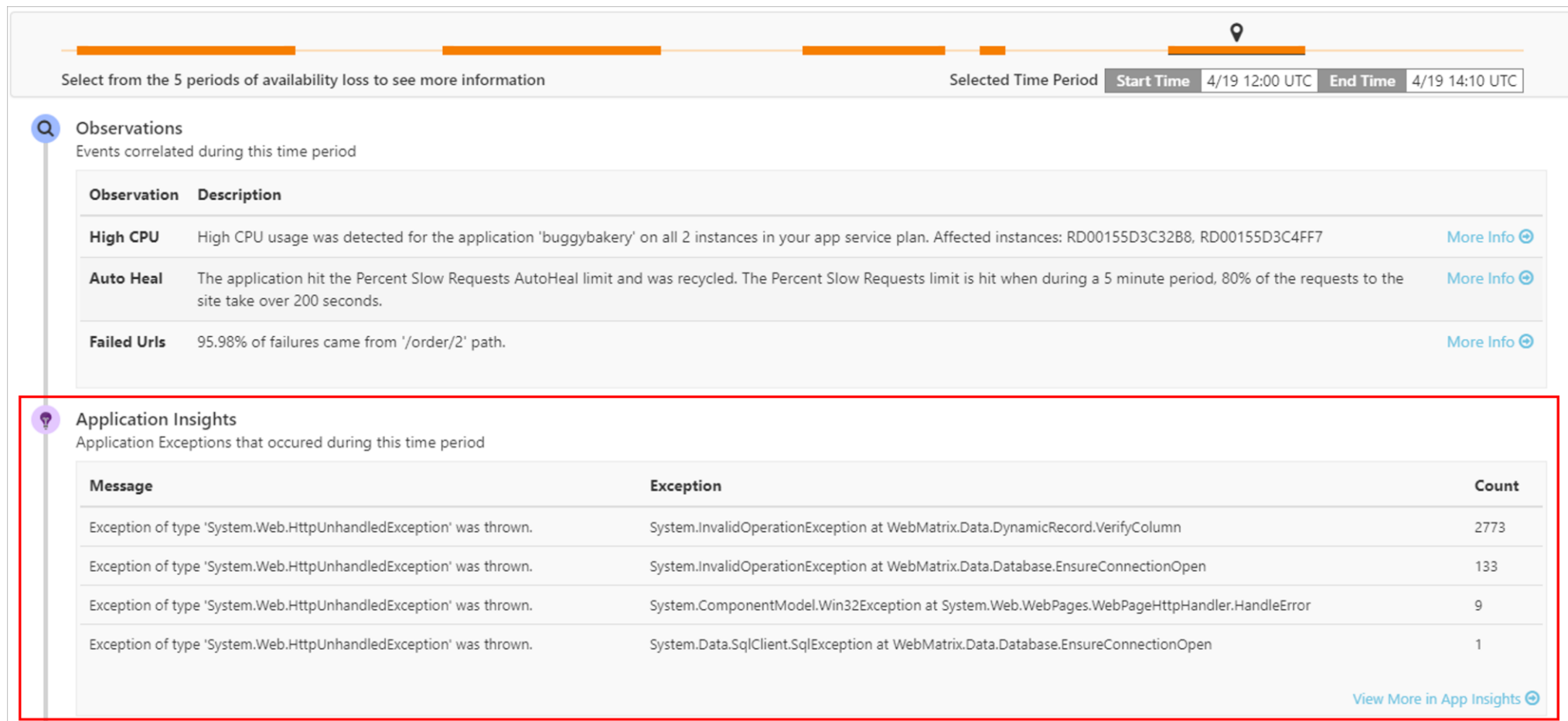
- Application Performance FAQs
- Deployment FAQs
- OSS FAQs
- Configuration and Management FAQs

RESOURCE CENTER

COMMUNITY

- MSDN Forums
- Stack Overflow
- @AzureSupport

App Insights Integration



Site Extensions

- Modify [IIS applicationhost.config](#) using [XDT Transforms](#)
- Deploy sub apps inside the Kudu folder for management actions
- <https://github.com/projectkudu/kudu/wiki/Azure-Site-Extensions>

Support for multiple languages

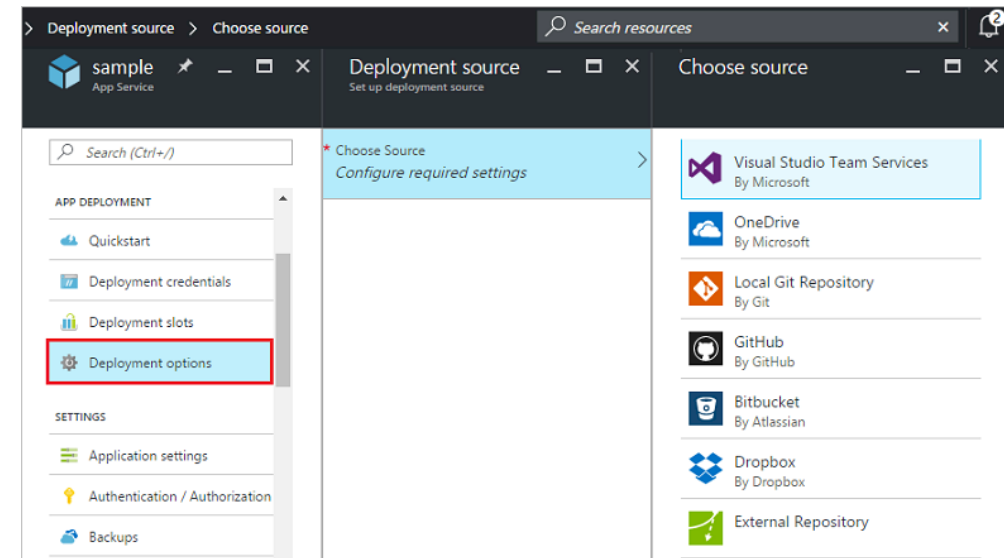
- App Settings
 - .NET configuration (injected into the .NET configuration)
 - PHP, Python, Java -> environment variables
 - For example Connection Strings
 - .NET configuration element - ConnectionStrings
 - MYSQL environment variable called MYSQLCONNSTR_
- Default documents
- Enabling Java for your app disables the .NET, PHP, and Python options

OS and runtime patching

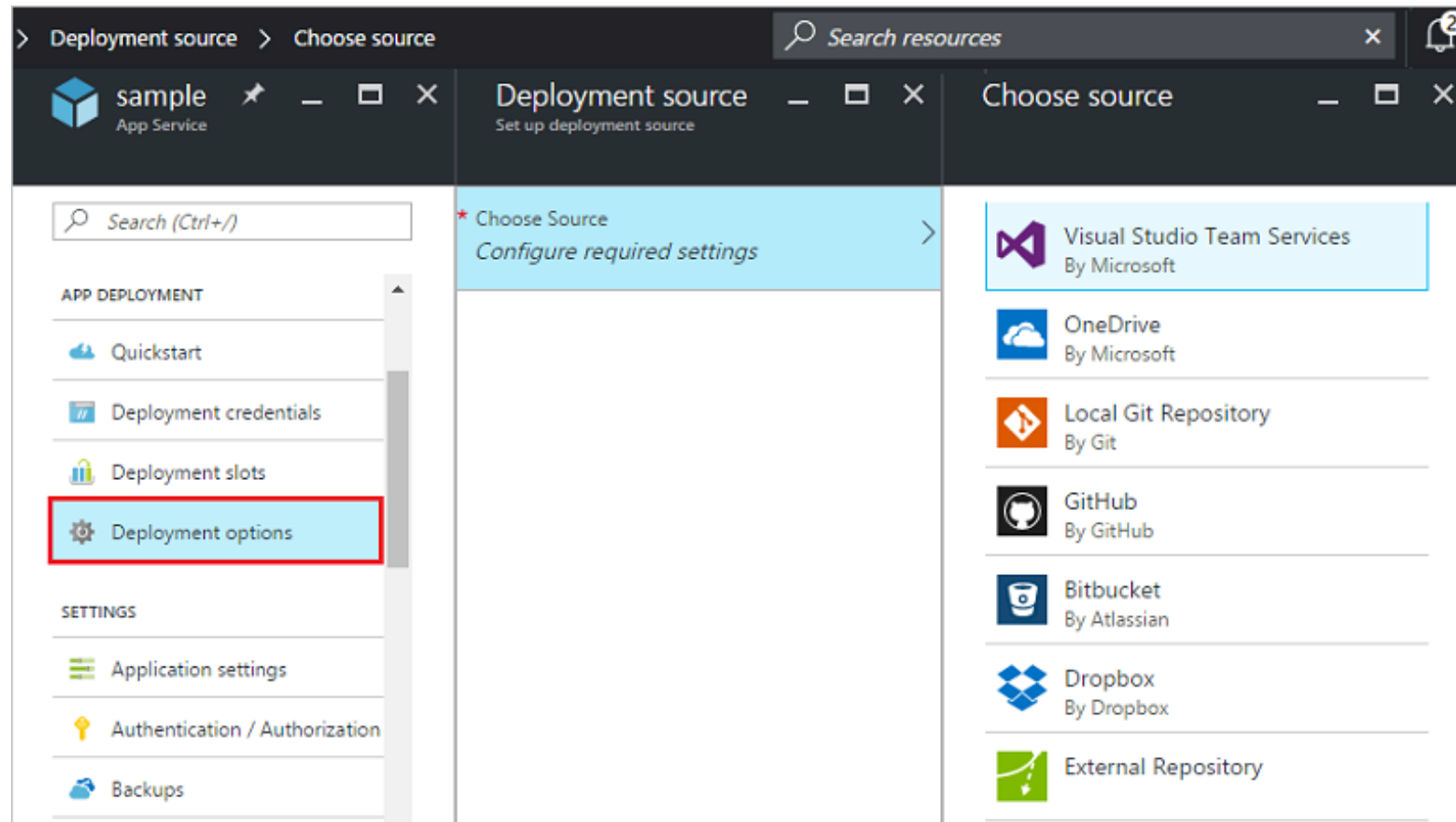
- New stable versions of language runtime (.NET, PHP, JAVA)
- Update can be:
 - Automatically installed (your app runs on new runtime)
 - Installed side by side (you need to manually upgrade your app)
 - Python patches need to be manually installed

Deploy Web App

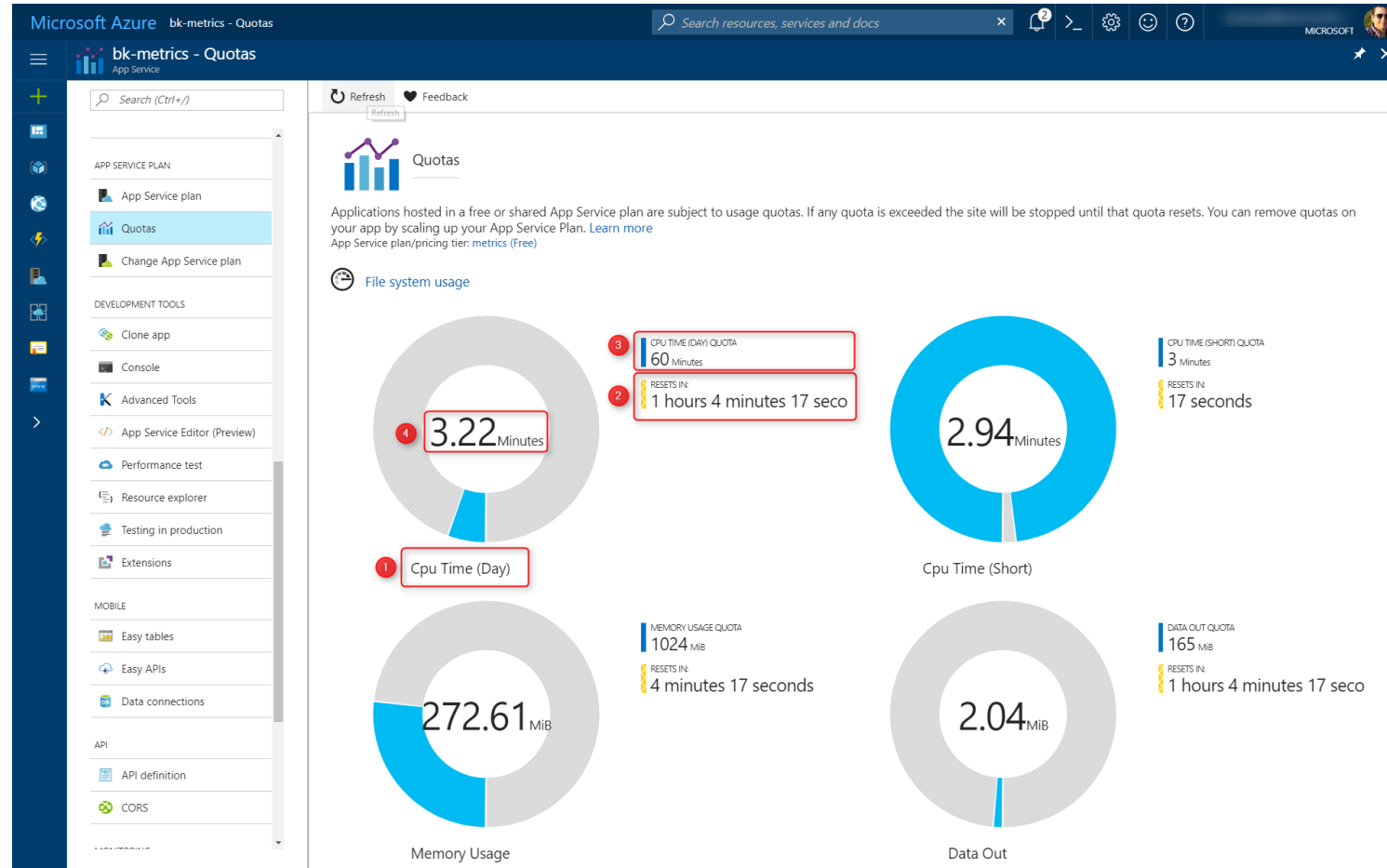
- ZIP or WAR file
- FTP
- Cloud Sync (Drop Box or One Drive)
- Continuous Deployment
- ARM Template



Deployment Slots



Quota and Metric Alerts



Backup and Restore

- Manual or scheduled
- What gets backed up
 - App Configuration
 - File Content
 - Database connected to your app
- Restore an app to previous snapshot
- Also look at App Cloning

WebJobs

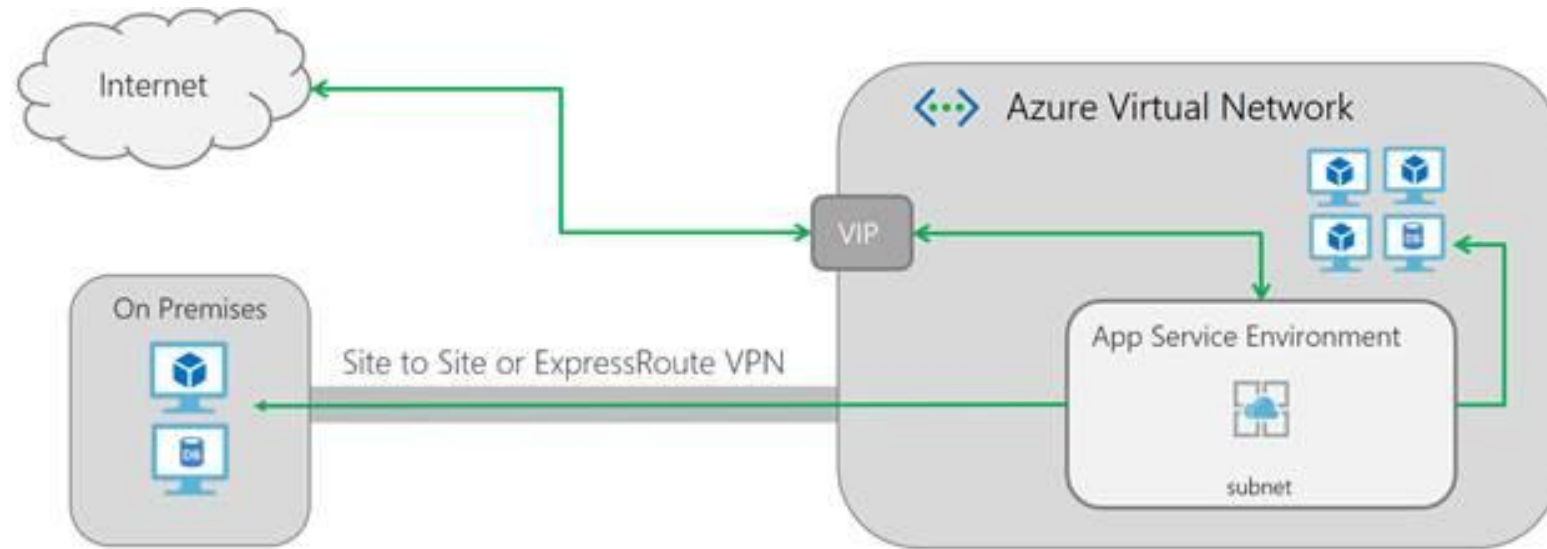
- Run a program in the same context as a web app
- Triggered or schedule
- .cmd, . ps1, .sh, .js etc
- Webjobs SDK –
 - simplifies creation of WebJobs
 - Structured (JSON) syntax for specifying event triggers
- Azure Functions is based on WebJobs SDK

```
public static void Run(  
    [QueueTrigger("items")] string myQueueItem,  
    [Blob("workitems/{queueTrigger}", FileAccess.Read)] Stream myBlob,  
    TraceWriter log)  
{  
    log.Info($"BlobInput processed blob\n Name:{myQueueItem} \n Size: {myBlob.Length} bytes");  
}
```

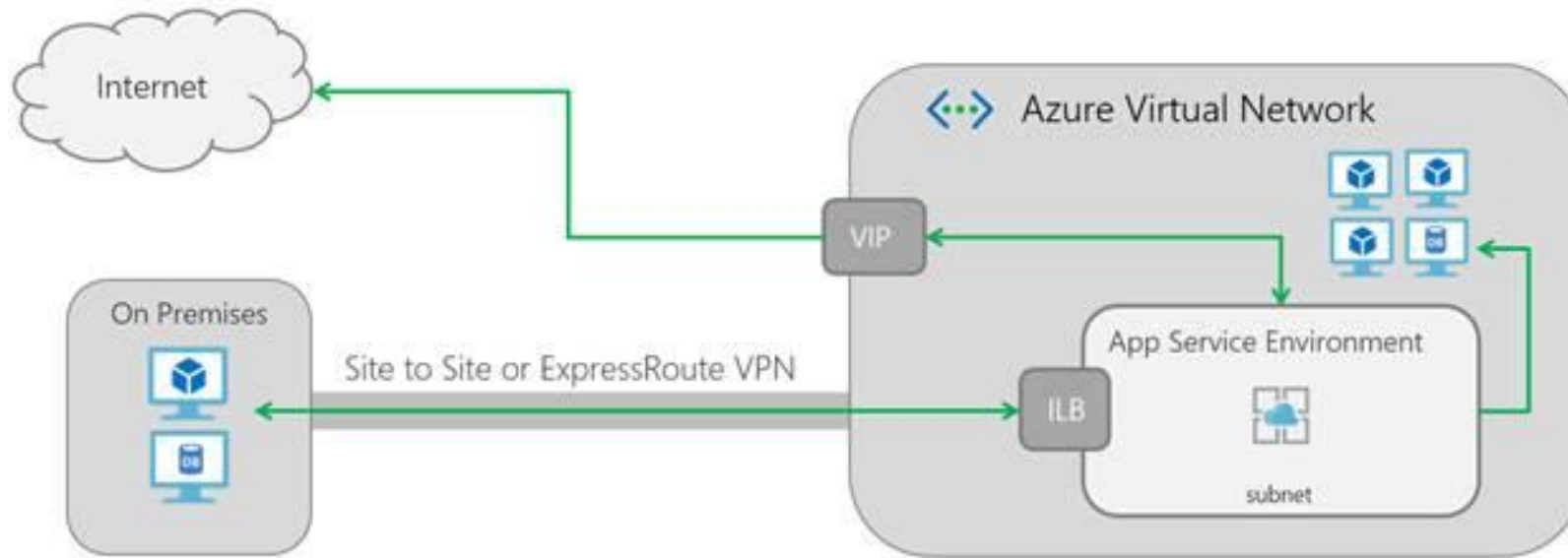
Dedicated Environment

- Fully isolated and dedicated environment
 - Windows, Linux, Docker Containers
- Appropriate for
 - High scale
 - Network isolation
 - High memory utilization
- ASE can be internet facing or internal-facing

External ASE



Internal ASE



Web apps for containers

Easily deploy and run container-based web apps at scale

Accelerated outer loop



Tight integration w/
Docker Hub, Azure Container Registry



Built-in CI/CD w/
Deployment Slots



Intelligent diagnostics &
troubleshooting, remote debugging

Fully managed platform



Automatic scaling
and load balancing



High availability
w/ auto-patching



Backup & recovery

Flexibility & choices



From CLI, portal, or
ARM template

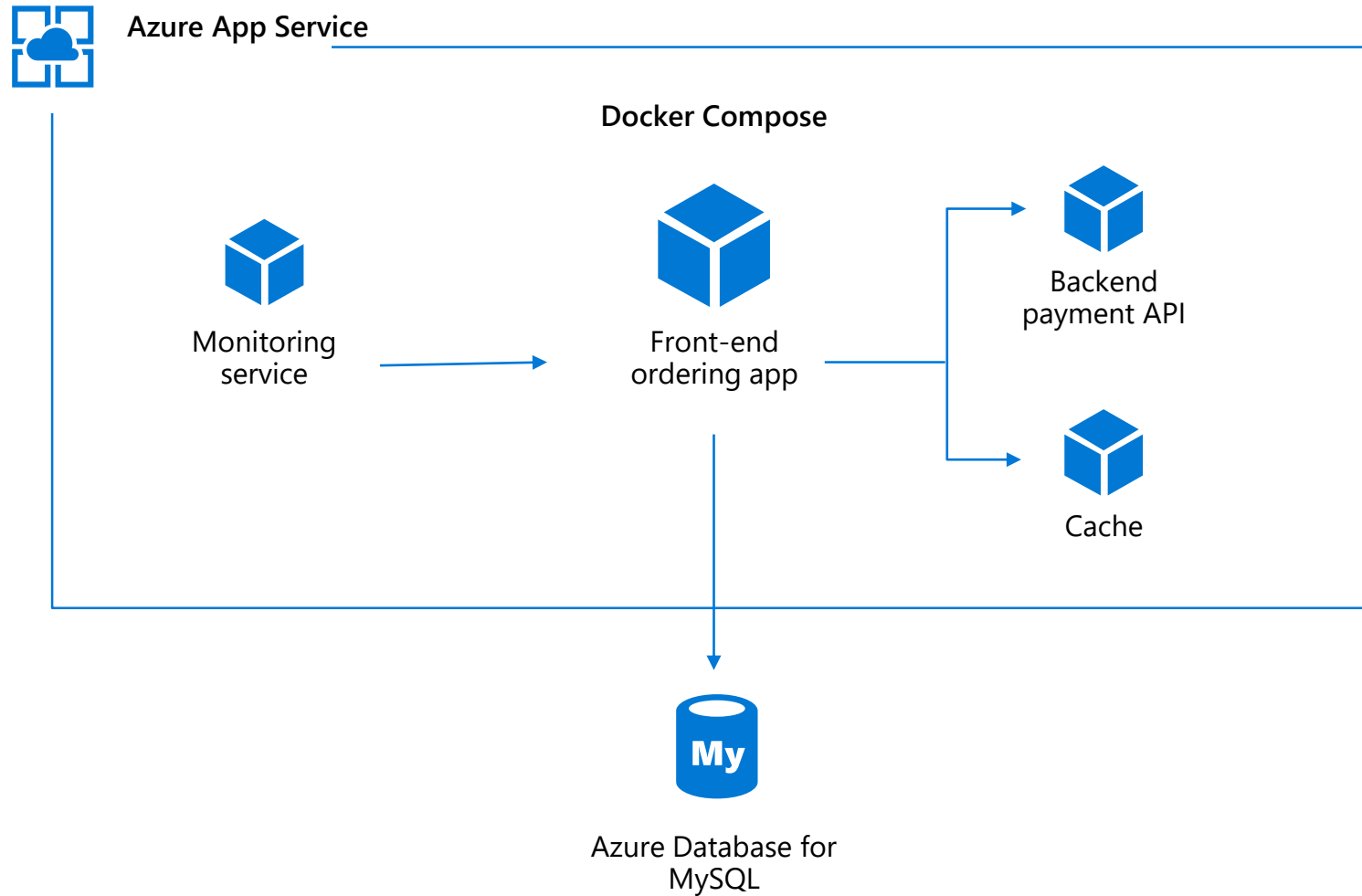


Single Docker image,
multi container w/ Docker compose,
or Kubernetes Pod Definition



IntelliJ, Jenkin, Maven Visual Studio family

Multi-container sample architecture



Demos

App Service Windows Containers

App Service + Windows Containers