



# Microsoft Azure Developer Associate (AZ-204) Crash Course

Developing Solutions for Microsoft Azure



# Reza Salehi

Cloud Consultant and Trainer



@zaalion



# Course Overview

# AZ-204 Skills Measured

Exam AZ-204: Developing Solutions for Microsoft Azure



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# Questions & Resources

- Please post questions in the Q&A box
- The course repository
  - <https://github.com/zaalion/oreilly-az-204>
- Reach out:
  - Twitter: [@zaalion](https://twitter.com/zaalion)



# AZ-204 Candidate Profile

- Professionals who:
  - Have subject matter expertise designing, building, testing, and maintaining cloud applications and services on Microsoft Azure.



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# Azure Data Engineers

- Should have 1-2 years professional development experience
- Experience with Microsoft Azure
- Can program in a language supported by Azure



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# AZ-204 Candidates

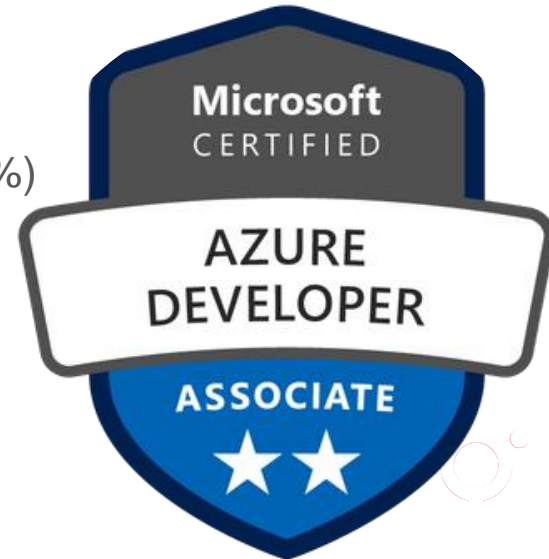
- Proficiency in
  - Azure SDKs, Azure PowerShell, Azure CLI,
  - Data storage options, data connections, APIs,
  - App authentication and authorization
  - Compute and container deployment
  - Debugging, performance tuning, and monitoring.





# AZ-204 Skills Measured

- Skills measured:
  - Develop Azure compute solutions (25-30%)
  - Develop for Azure storage (15-20%)
  - Implement Azure security (20-25%)
  - Monitor, troubleshoot, and optimize Azure solutions (15-20%)
  - Connect to and consume Azure services and third-party services (15-20%)



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# Course Repository

<https://github.com/zaalion/oreilly-az-204>



zaalion / oreilly-az-204 Public

[Code](#) [Issues](#) [Pull requests](#) [Actions](#) [Projects](#) [Wiki](#) [Security](#) 10 [Insights](#) [Settings](#)

master ▾

1 branch

0 tags

Go to file

Add file ▾

<> Code ▾



rezasalehinewsig Updated slide deck PDF



Demos

demo files arrangement



.gitignore

Demos



AP-204 Resources.pdf

Resource updates



OReilly-AZ-204-Slide-Deck.pdf

Updated slide deck PDF

Help people interested in this repository understand your project by adding a

Local

Codespaces

New

Clone



HTTPS

SSH

GitHub CLI

<https://github.com/zaalion/oreilly-az-204.git>



Use Git or checkout with SVN using the web URL.

Open with GitHub Desktop

Open with Visual Studio

Download ZIP

# Develop Azure Compute Solutions

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# Develop Azure Compute Solutions

- Implement IaaS solutions
- Create Azure App Service Web Apps
- Implement Azure functions



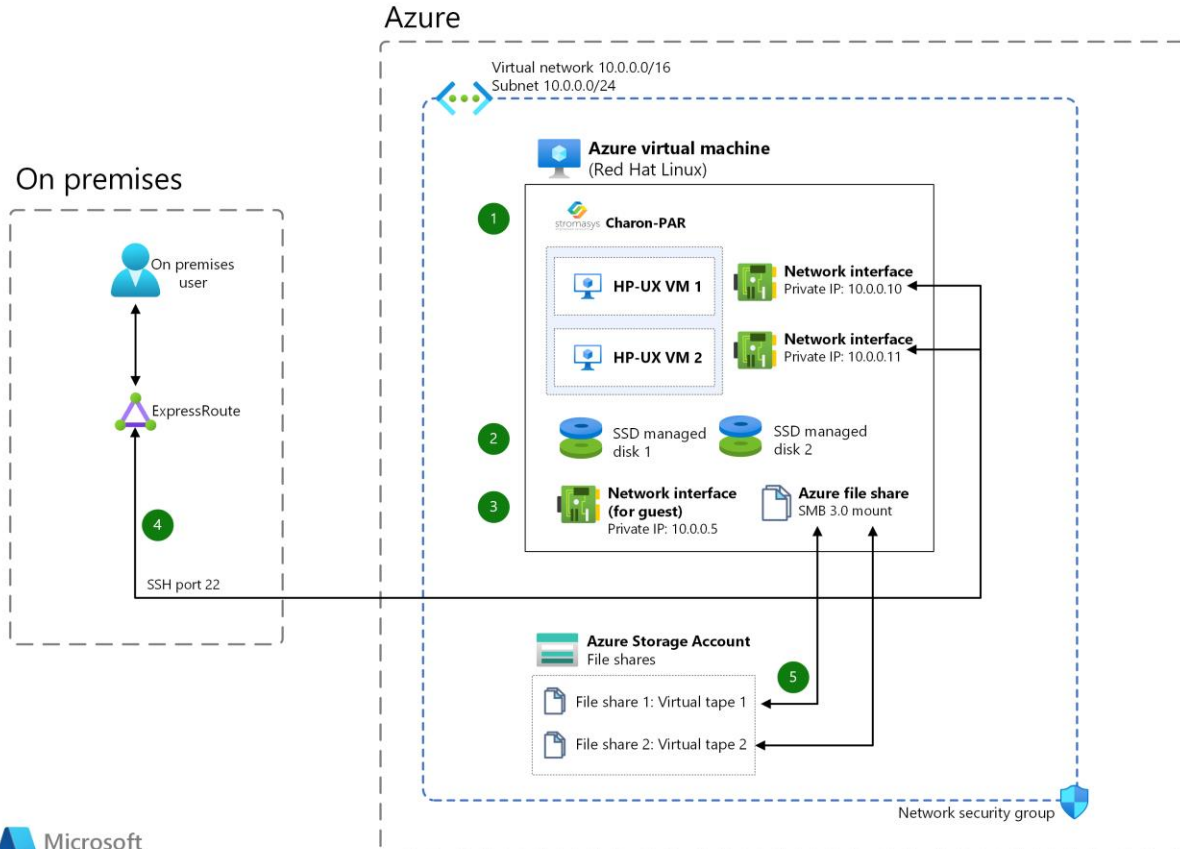
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# Implement IaaS solutions

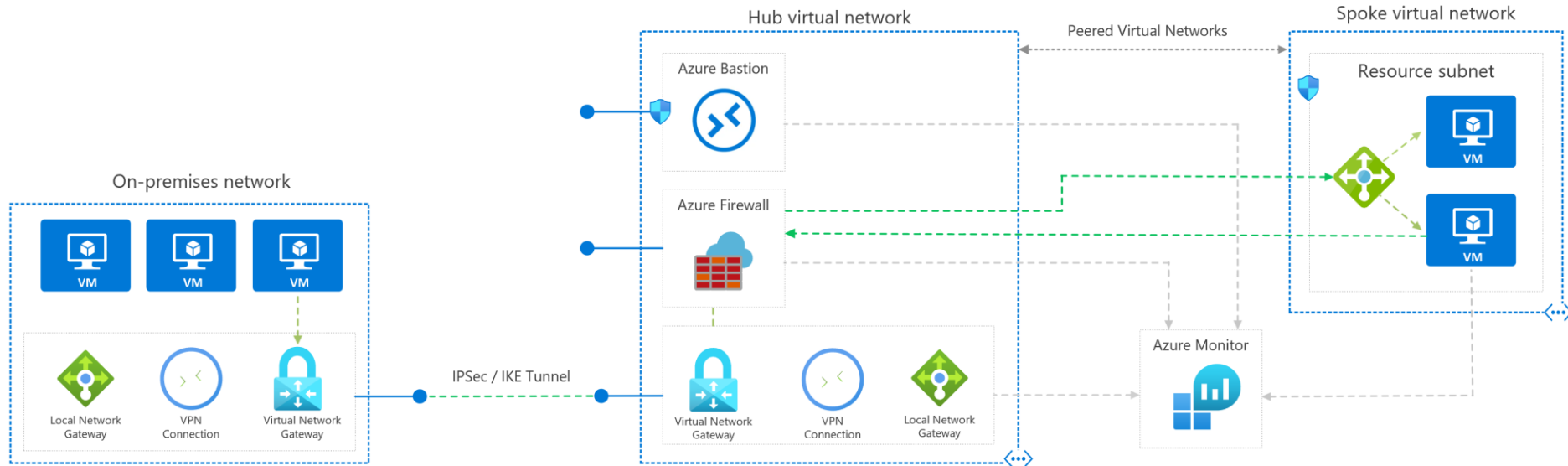
- Provision virtual machines (VMs) [see [1](#) [2](#) [3](#)]
- Configure, validate, and deploy ARM templates [see [1](#) [2](#) [3](#) [4](#) [5](#) [6](#) [7](#) [8](#)]
- Configure container images for solutions [see [1](#) [2](#)]
- Publish an image to the Azure Container Registry [see [1](#) [2](#) [3](#) [4](#)]
- Run containers by using Azure Container Instance [see [1](#) [2](#) [3](#)]



# Implement IaaS solutions




# Implement IaaS solutions





# ARM Templates

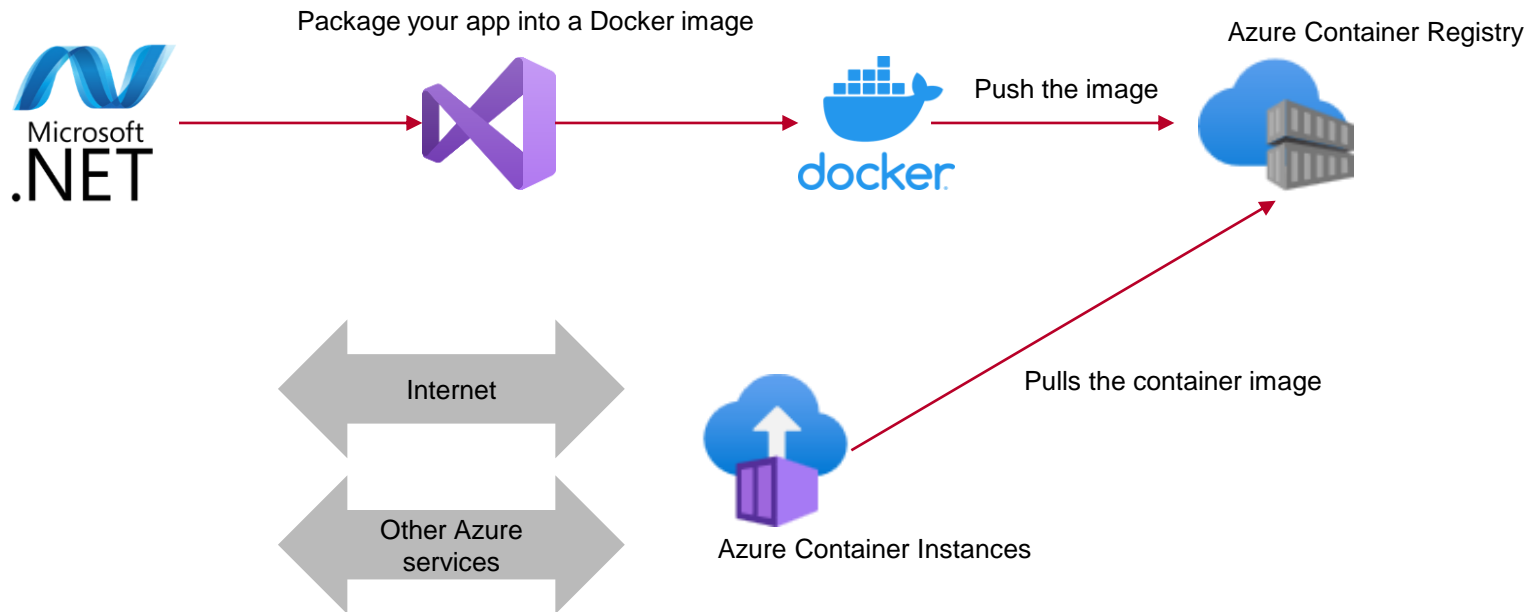
JSON

 Copy

```
{
  "$schema": "https://schema.management.azure.com/schemas/2019-04-01/deploymentTemplate.json#",
  "contentVersion": "",
  "apiProfile": "",
  "parameters": {  },
  "variables": {  },
  "functions": [  ],
  "resources": [  ],
  "outputs": {  }
}
```

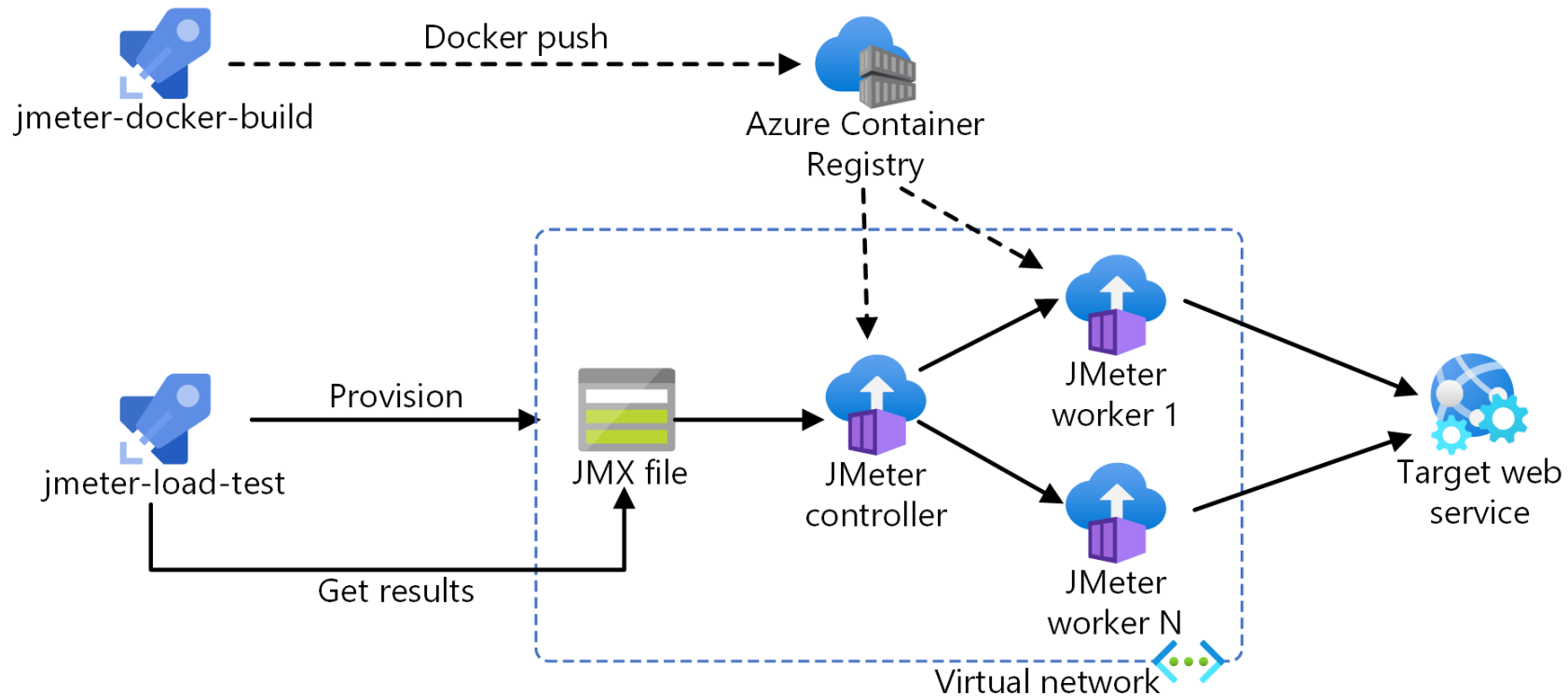


# Host Your Code in ACI



<https://docs.microsoft.com/en-us/azure/container-instances/container-instances-overview>





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# Create Azure App Service Web Apps

- Create an Azure App Service Web App [see [1](#) [2](#) [3](#)]
- Enable diagnostics logging [see [1](#)]
- Deploy code to a web app [see [1](#) [2](#) [3](#) [4](#)]
- Configure web app settings including SSL, API settings, and connection strings [see [1](#) [2](#)]
- Implement auto scaling rules including scheduled autoscaling and autoscaling by operational or system metrics [see [1](#)]



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# Azure App Services

Azure App Service is an HTTP-based service for hosting web applications, REST APIs, and mobile back ends. It can host .NET, .NET Core, Java, Ruby, Node.js, PHP, or Python code

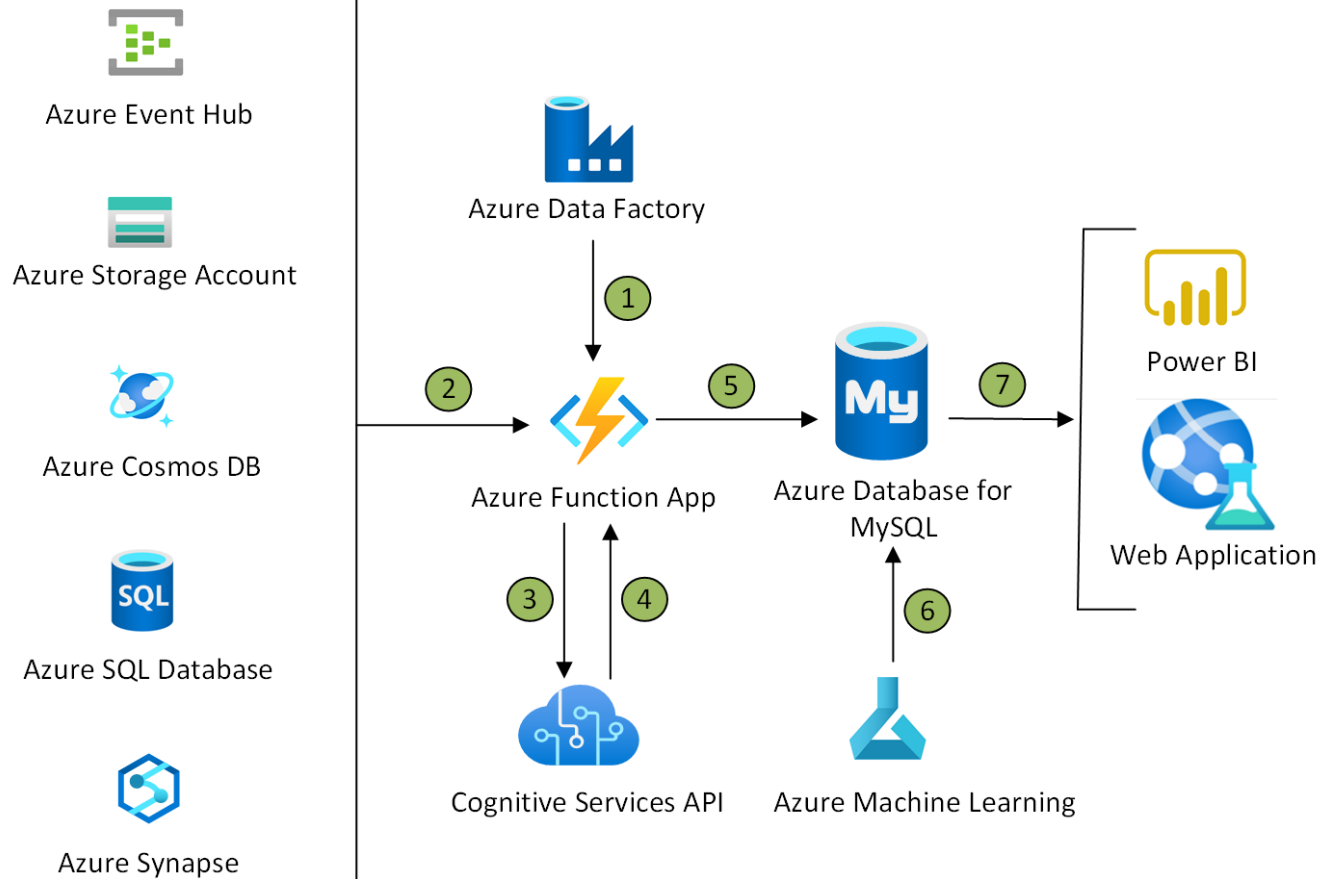


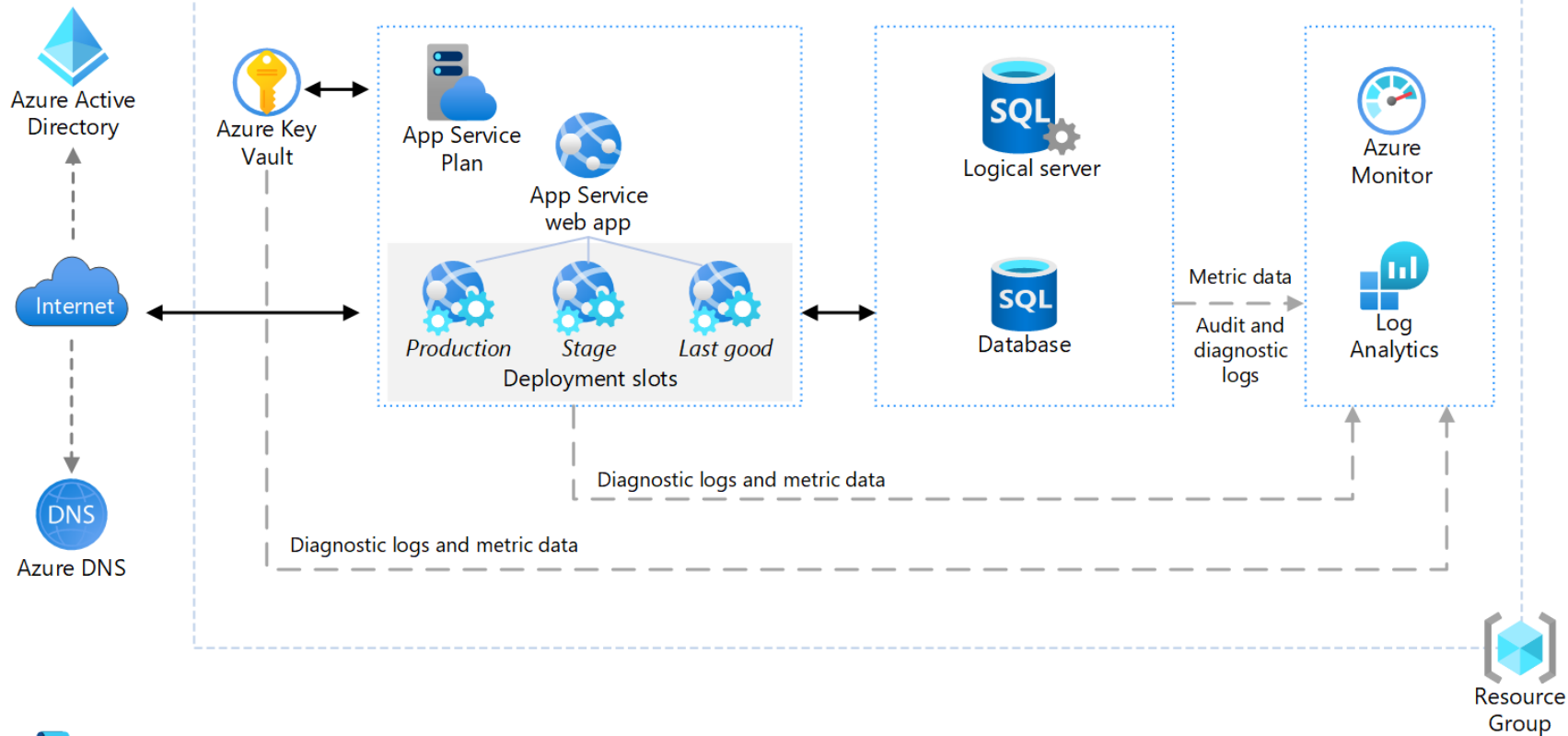
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# Azure App Services

- Is a PaaS service, which means less administrative overhead comparing to IaaS services
- The service is managed by Azure. You just deploy your code and run it
- Host websites and RESTful APIs using the web app feature
- Other apps such as mobile app back ends or automated business processes
- Use for legacy and new applications
- Global scale with high availability









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# Implement Azure functions

- Create and deploy Azure Functions apps [see [1](#) [2](#) [3](#)]
- Implement input and output bindings for a function [see below]
- Implement function triggers by using data operations, timers, and webhooks  
[see [1](#) [2](#) [3](#) [4](#)]
- Implement Azure Durable Functions [see [1](#) [2](#) [3](#) [4](#) [5](#)]



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# Azure Functions

- Run isolated pieces of code in a serverless solution.
- Best to host microservices and APIs (HTTP, and other types)

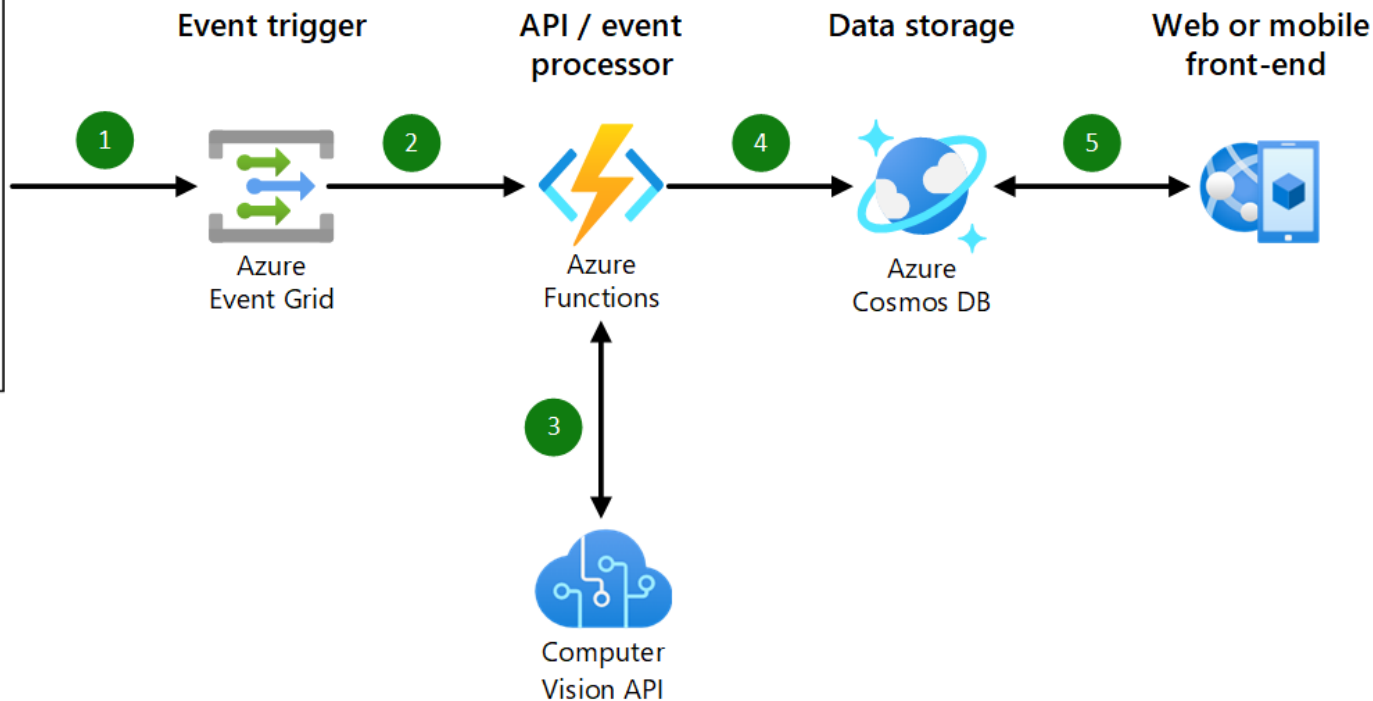
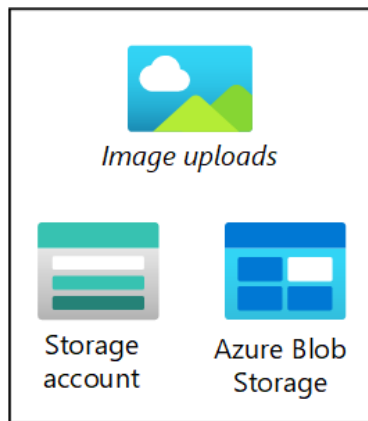


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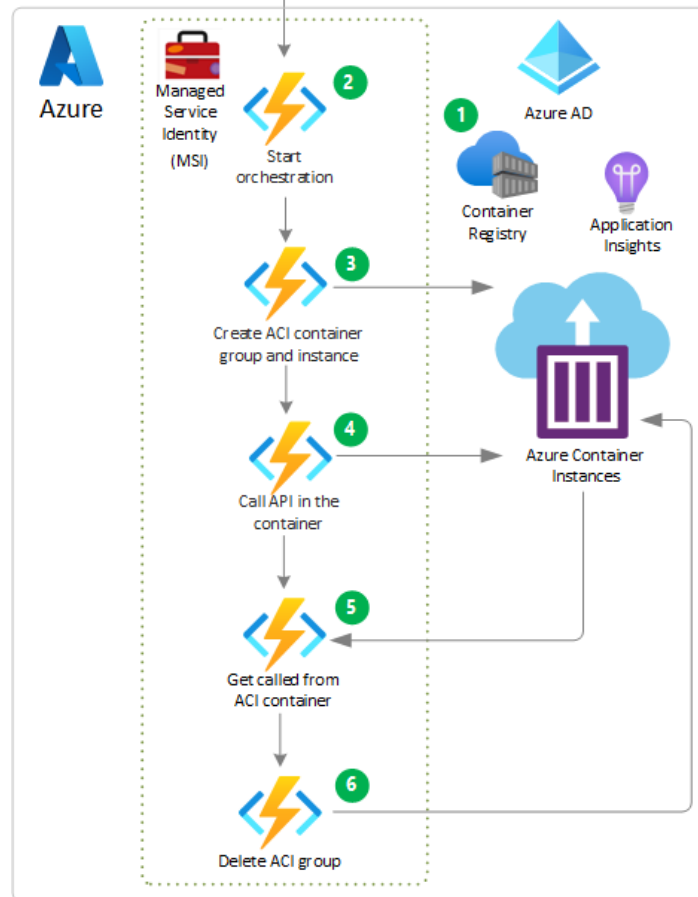
# Azure Functions

- A serverless PaaS
- The service is managed by Azure. Just deploy your code and run it
- Host APIs and microservices
- Use for legacy and new applications
- Automatic scale and high availability





HTTP API call to Orchestrator  
Durable Function



# Develop for Azure Storage

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# Develop for Azure storage

- Develop solutions that use Cosmos DB storage
- Develop solutions that use blob storage



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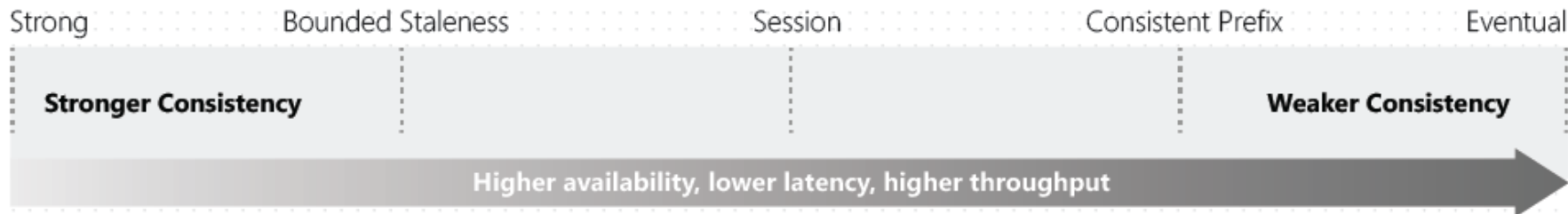
# Develop solutions that use Cosmos DB storage

- Select the appropriate API and SDK for a solution [see [1](#) [2](#) [3](#) [4](#) [5](#) [6](#) [7](#) [8](#) [9](#)]
- Implement partitioning schemes and partition keys [see [1](#) [2](#)]
- Perform operations on data and Cosmos DB containers [see [1](#) [2](#)]
- Set the appropriate consistency level for operations [see [1](#)]
- Manage change feed notifications [see [1](#), [2](#)]





# Consistency Levels in Azure Cosmos DB





## Event-Computing and Notifications

Retail, Gaming, Content management



Azure  
Functions



Azure  
Notification Hubs



Azure  
App Service

## Stream Processing

IoT processing, Data Science & analytics



Azure  
Stream Analytics



Azure  
HDInsight



Apache  
Spark



Apache  
Storm

## Data movement

Enterprise data management



Azure  
Storage Blob



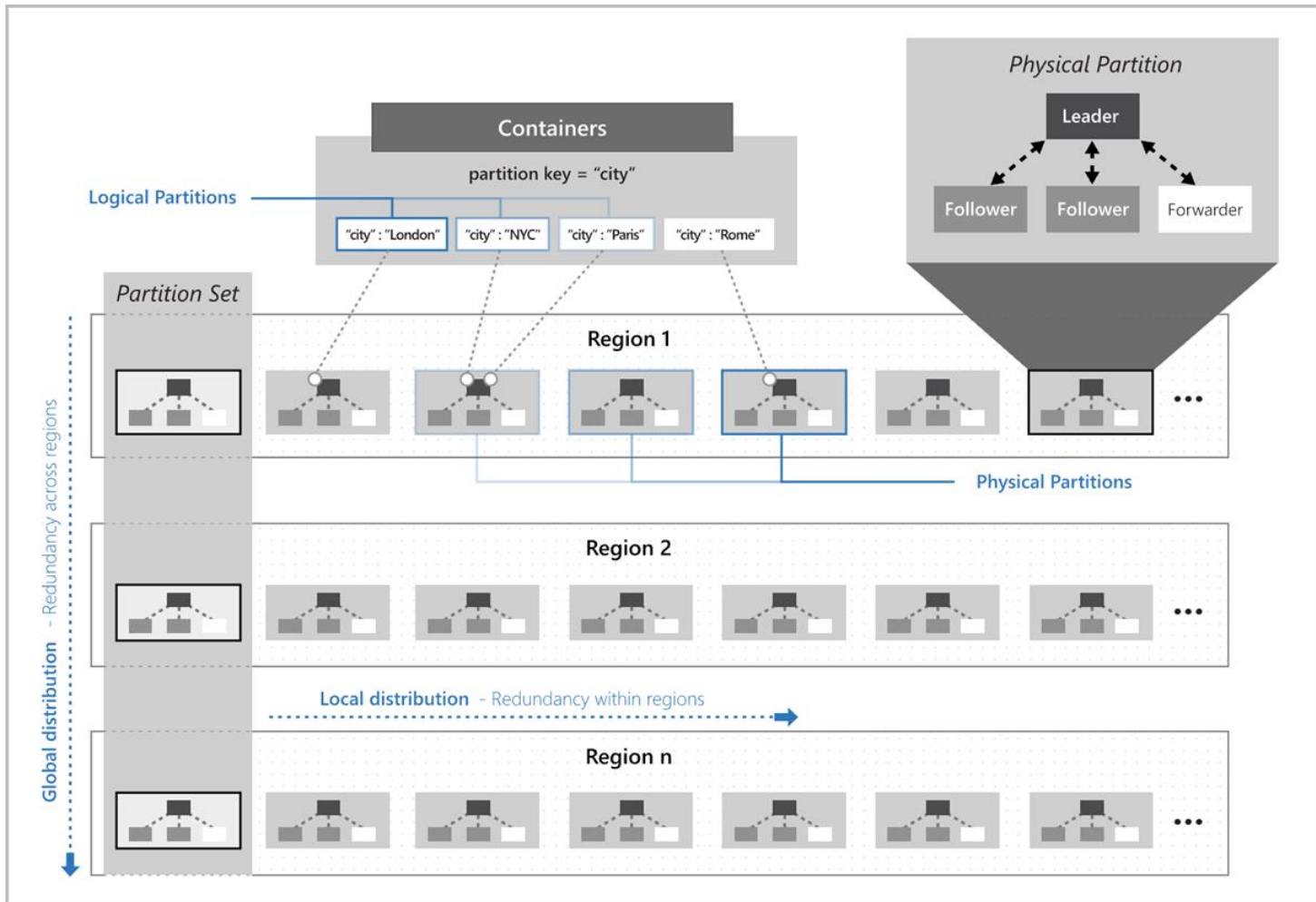
Azure  
Storage Table

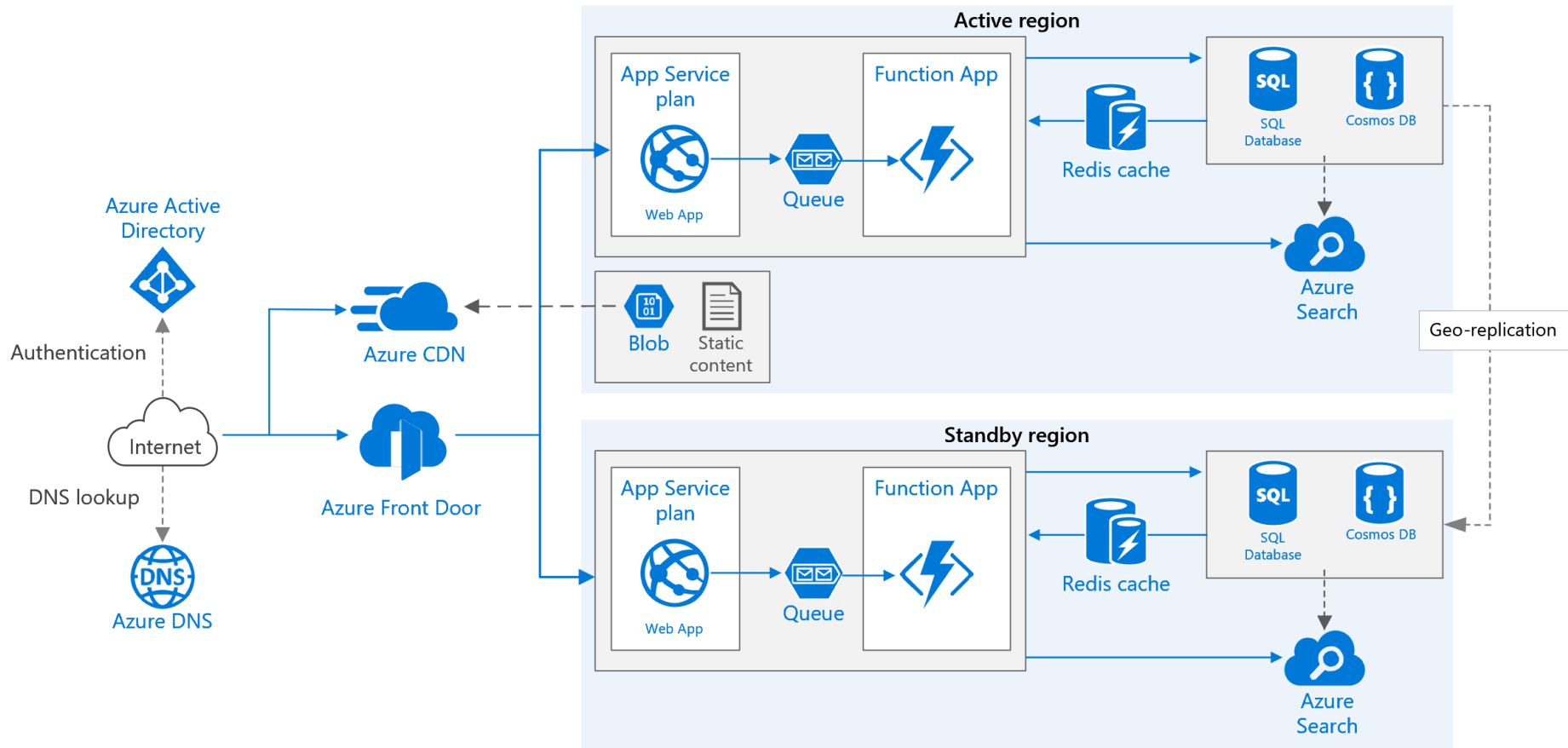


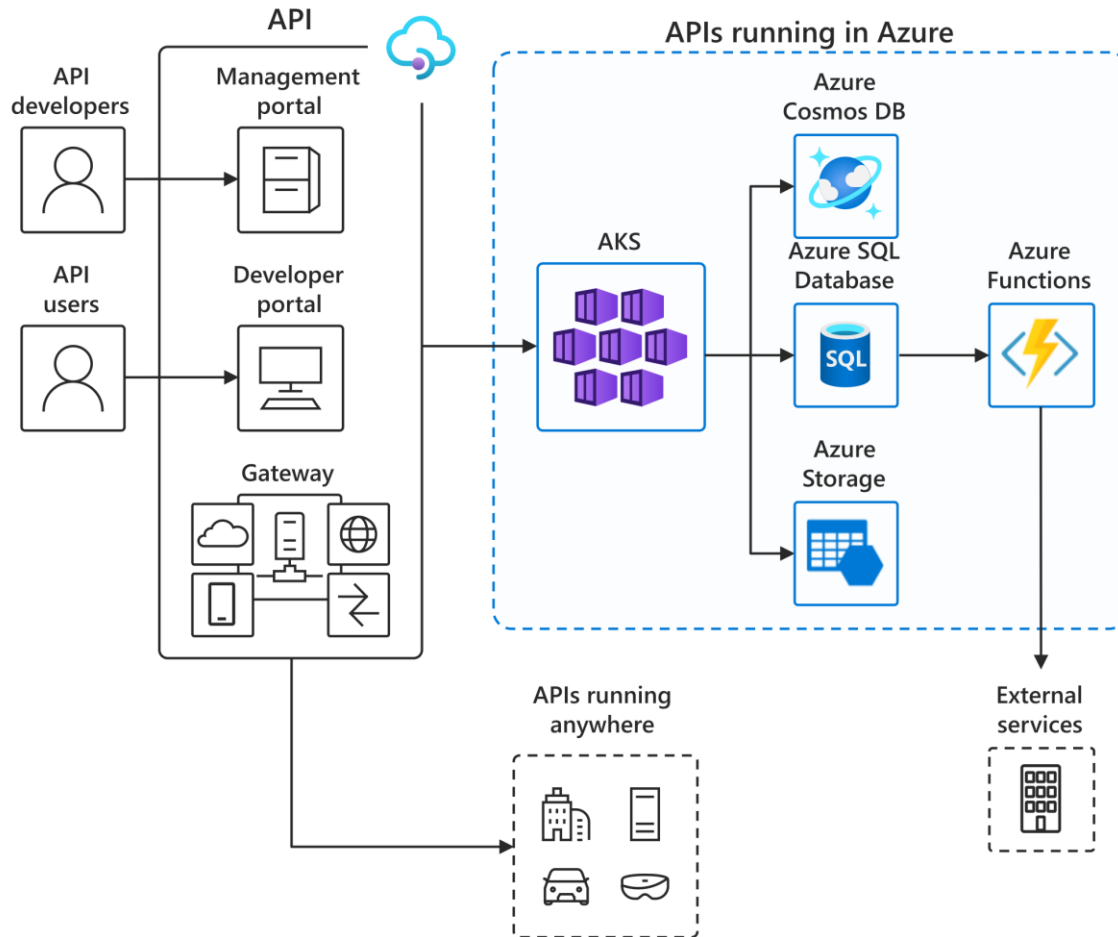
Azure  
Data Lake



Azure  
Cosmos DB







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# Develop solutions that use blob storage

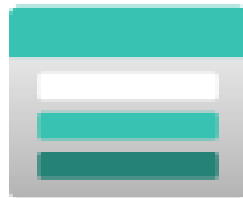
- Move items in Blob storage between storage accounts or containers [see [1](#)]
- Set and retrieve properties and metadata [see [1](#)]
- Perform operations on data by using the appropriate SDK [see [1](#) [2](#)]
- Implement storage policies, and data archiving and retention [see [1](#) [2](#) [3](#) [4](#)]



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# Azure Storage Account

Contains all Azure Storage data objects, including blobs, file shares, queues, and tables.



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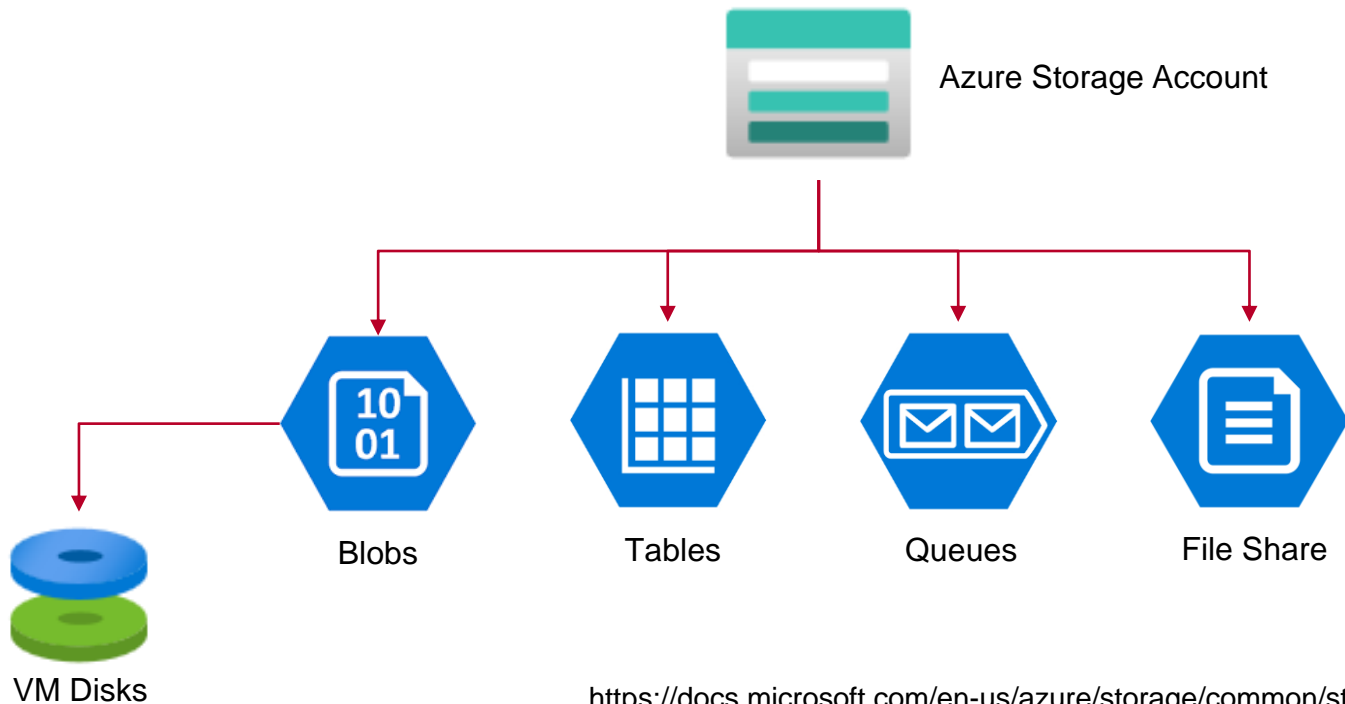
# Azure Storage Account

- Accessible from around the globe over HTTP(S)
- Store blobs, tables, queues, and file shares
- Access via public and private endpoints
- Financially-backed SLA
- Security-in-depth (firewall, in transit, at rest)





# Azure Storage Services

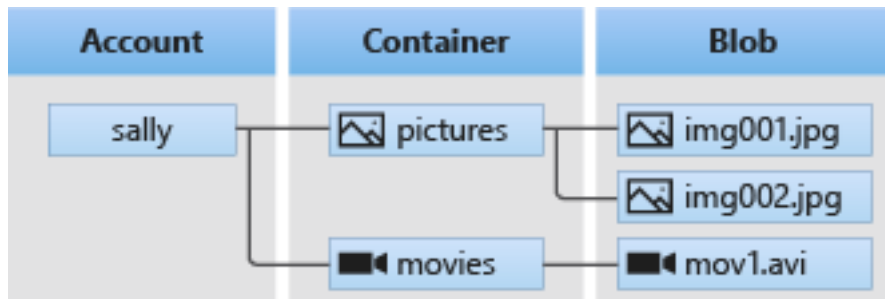


<https://docs.microsoft.com/en-us/azure/storage/common/storage-introduction>

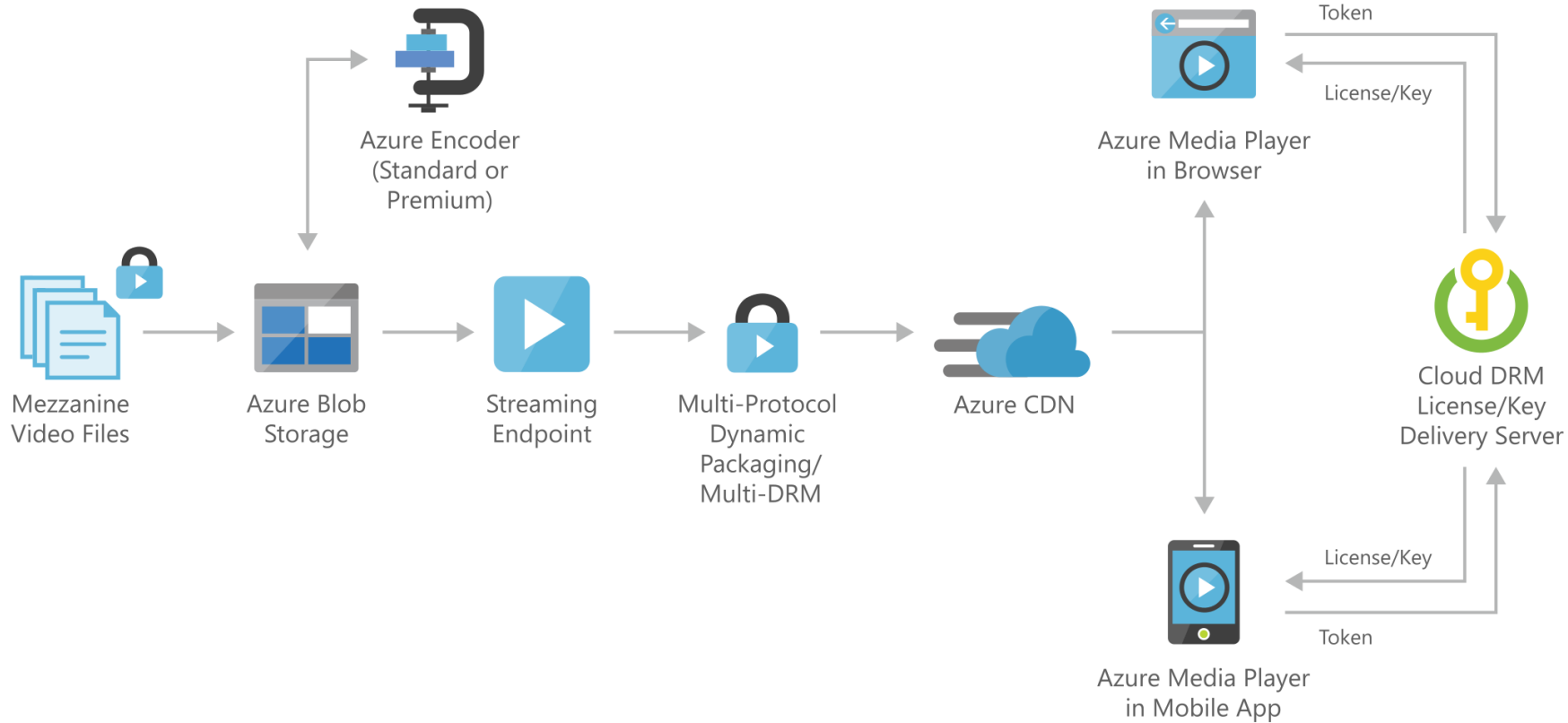


# Azure Storage Account: Blobs

A scalable object store for text/binary files (unstructured data). Also includes support for big data analytics through Data Lake Storage Gen2







# Implement Azure Security

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# Implement Azure Security

- Implement user authentication and authorization
- Implement secure cloud solutions



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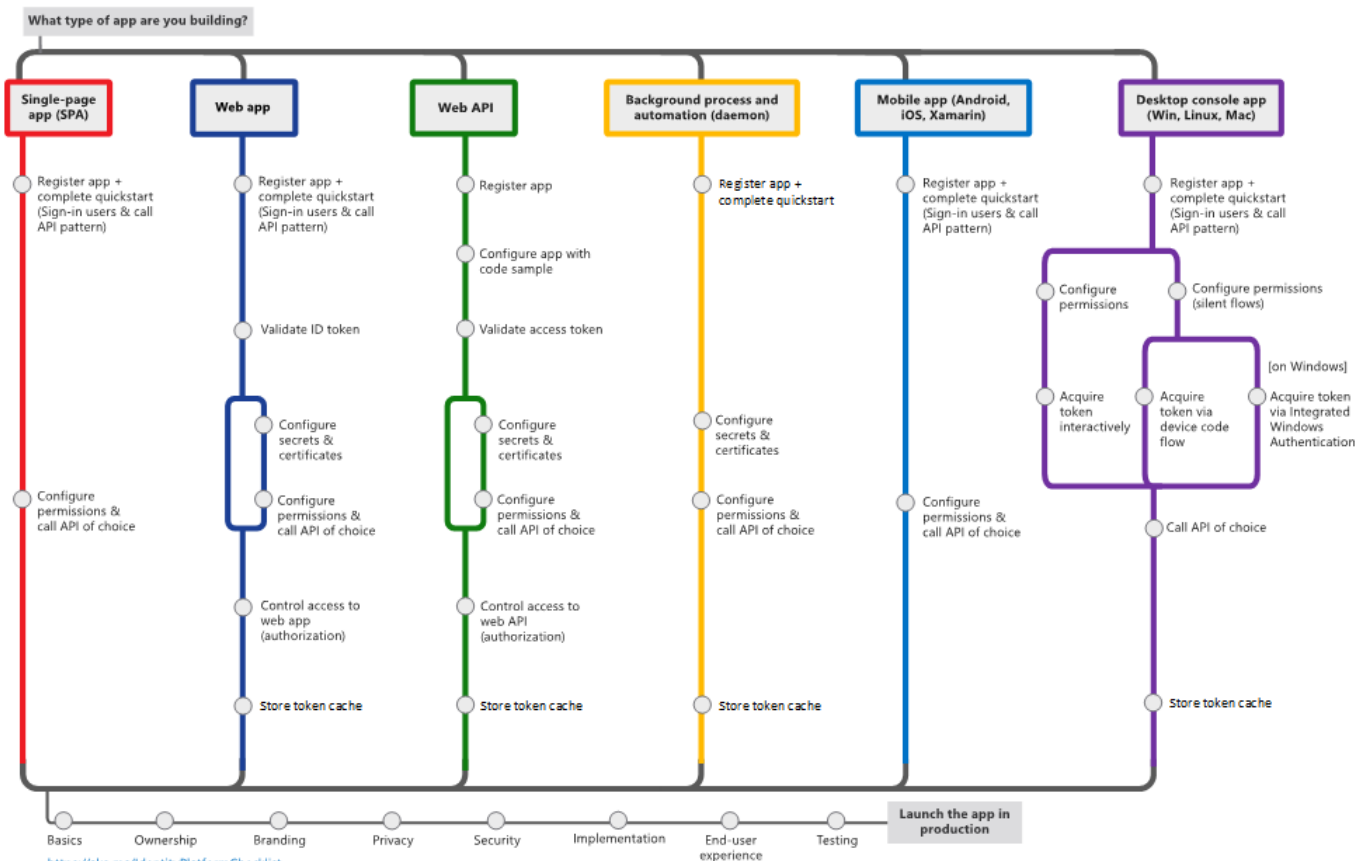
# Implement user authentication and authorization

- Authenticate and authorize users by using the Microsoft Identity platform [see [1](#) [2](#) [3](#) [4](#) [5](#)]
- Authenticate and authorize users and apps by using Azure Active Directory [see [1](#) [2](#)]
- Create and implement shared access signatures [see [1](#) [2](#)]
- Implement solutions with Microsoft Graph [see [1](#) [2](#) [3](#) [4](#) [5](#)]

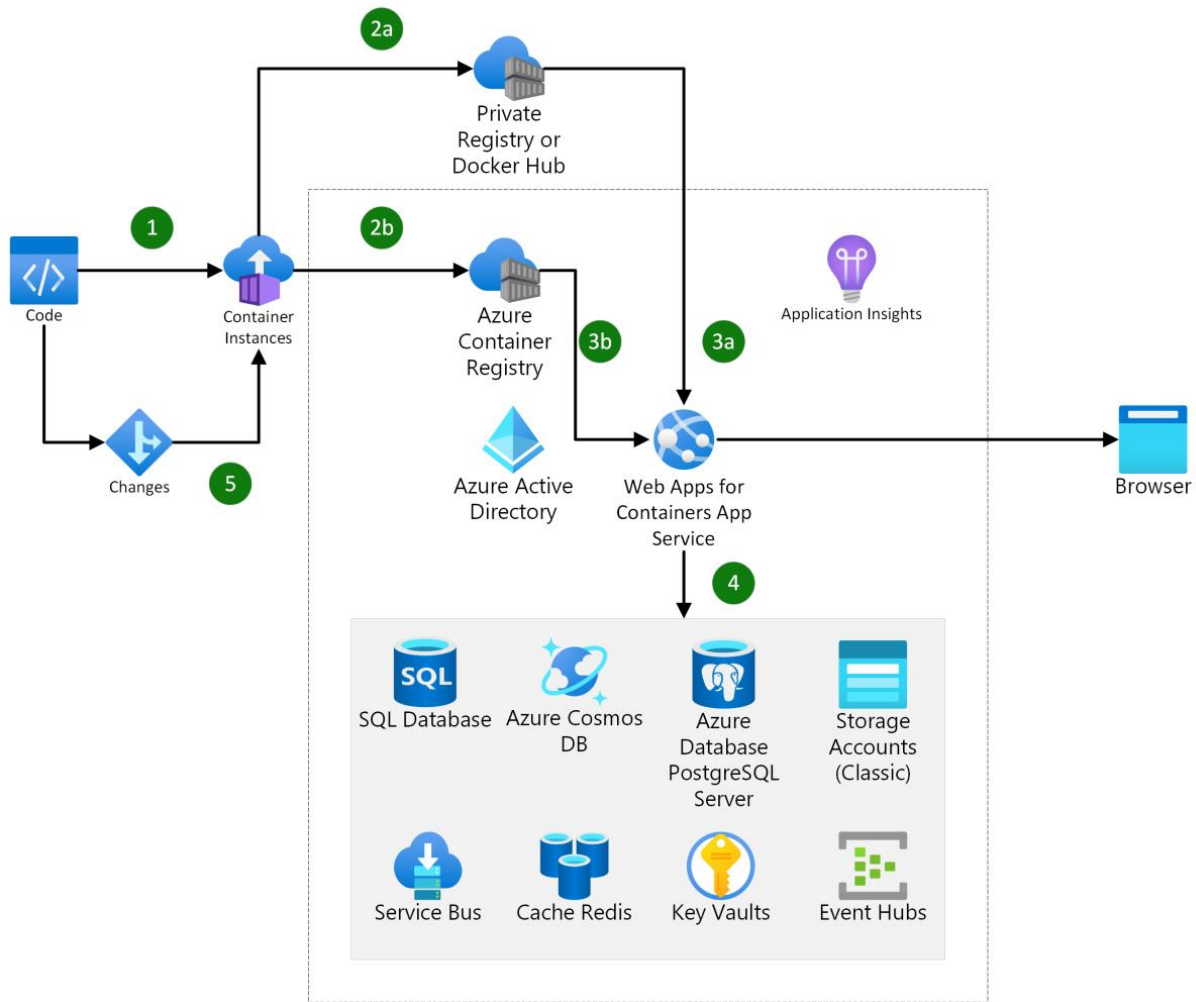


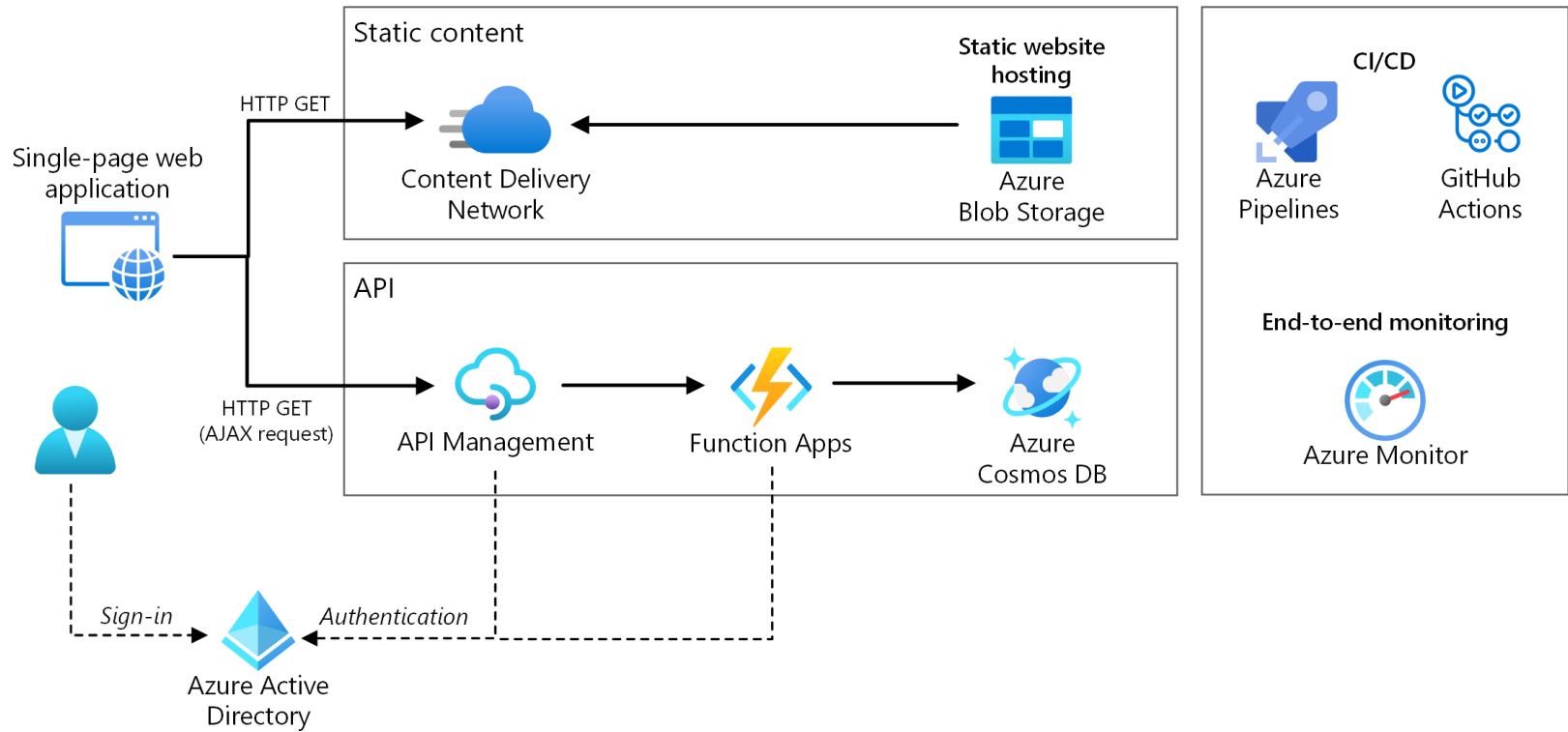
# Microsoft identity platform

<http://aka.ms/IdentityPlatform>









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# Implement secure cloud solutions

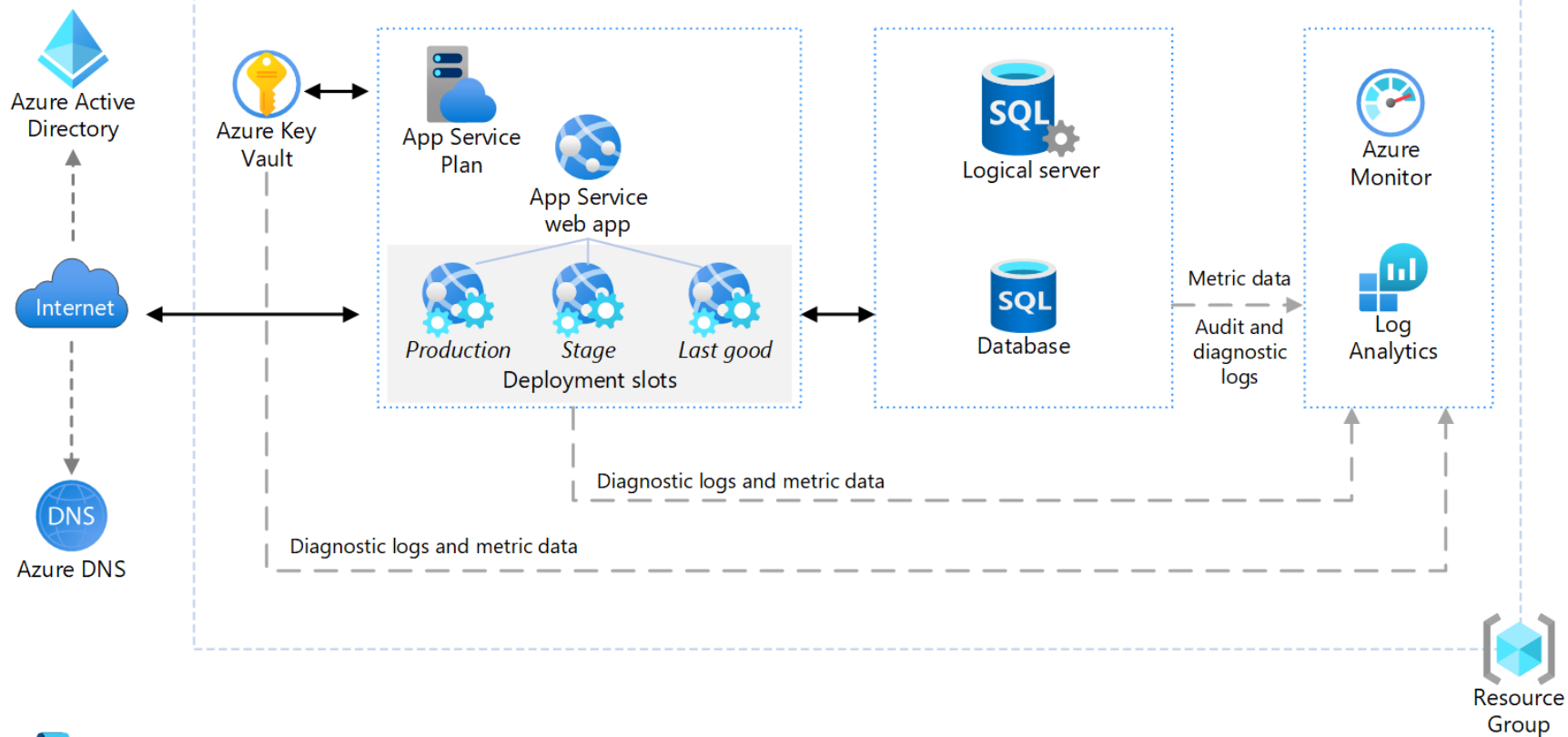
- Secure app configuration data by using App Configuration Azure Key Vault

[see [1](#) [2](#) [3](#)]

- Develop code that uses keys, secrets, and certificates stored in Azure Key

Vault [see [1](#) [2](#) [3](#)]





# Monitor, Troubleshoot, and Optimize Azure Solutions

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# Monitor, troubleshoot, and optimize Azure solutions

- Implement caching for solutions
- Troubleshoot solutions using metrics and log data

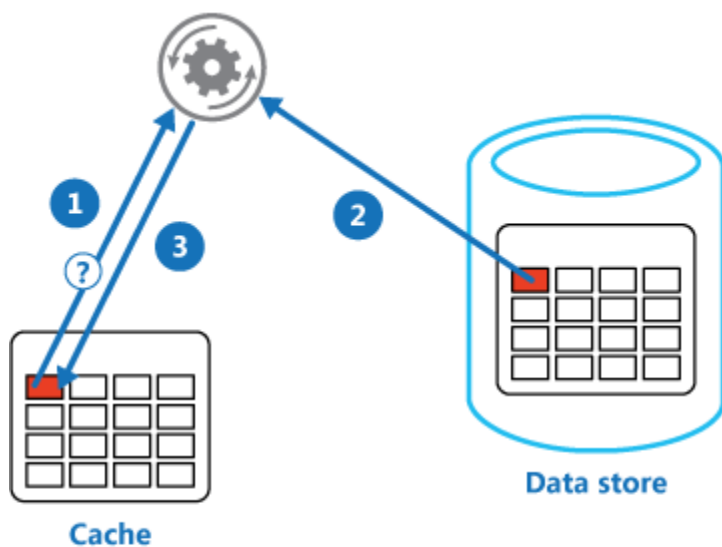




# Implement caching for solutions

- Configure cache and expiration policies for Azure Cache for Redis [see [1](#) [2](#) [3](#)]
- Implement secure and optimized application cache patterns including data sizing, connections, encryption, and expiration [see [1](#)]





- 1: Determine whether the item is currently held in the cache.
- 2: If the item is not currently in the cache, read the item from the data store.
- 3: Store a copy of the item in the cache.





Browser



CDN



CMS on Web App



Application Insights



SQL Database



Azure Cache for Redis



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# Troubleshoot solutions using metrics and log data

- Configure an app or service to use Application Insights [see [1](#) [2](#) [3](#)]
- Review and analyze metrics and log data [see [1](#)]
- Implement Application Insights web tests and alerts [see [1](#) [2](#) [3](#)]





1st-function

40.3 ms  
24K calls



2nd-function

27.4 ms  
24K calls



3rd-function

32.2 s | 3.1%  
53K calls

1.5 s  
323 calls

21.2 ms  
37K calls

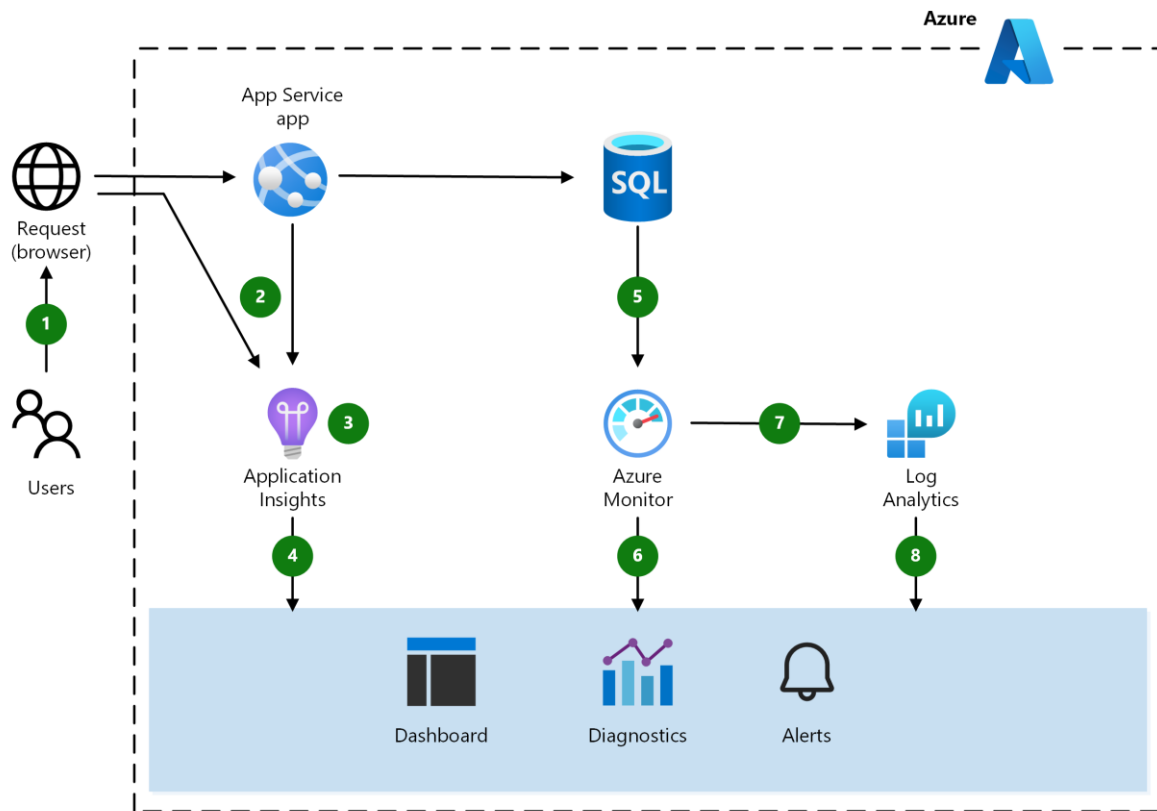


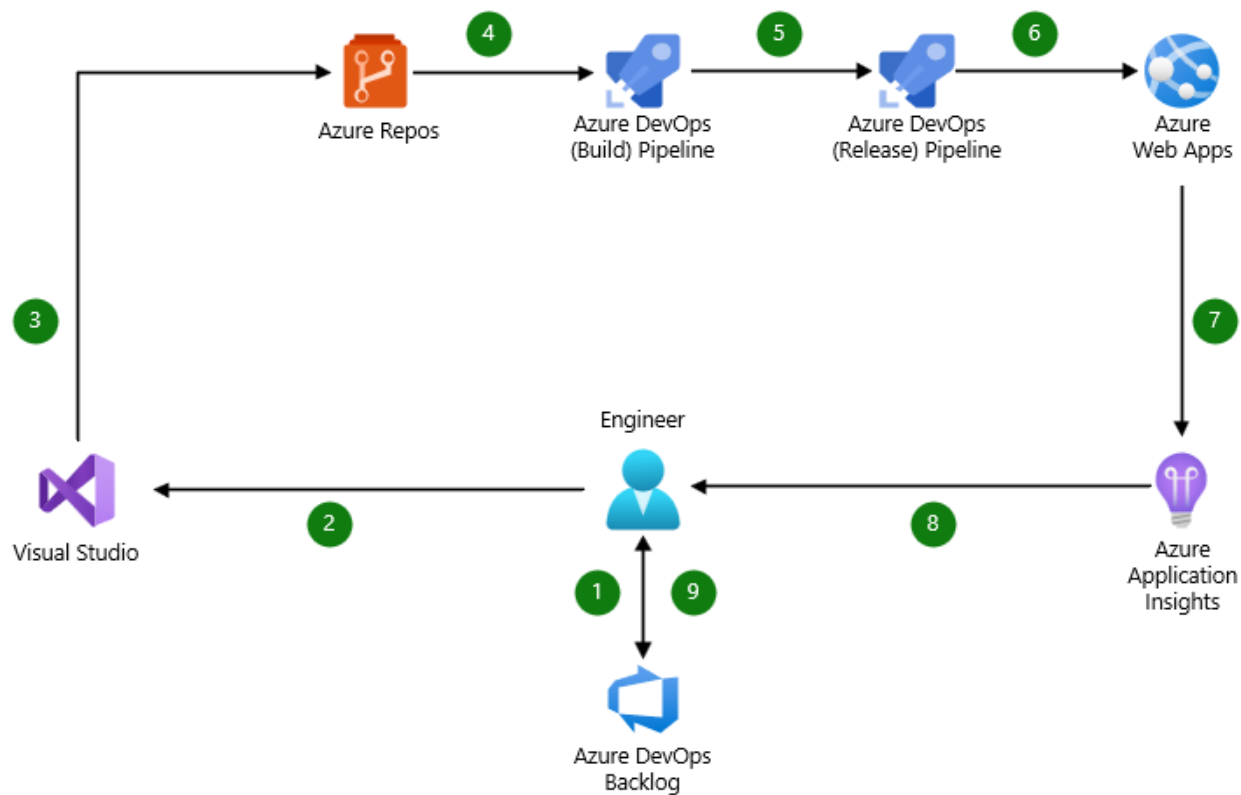
Database  
HTTP



final-eventhub  
AZURE EVENT HUBS







# **Connect to and Consume Azure Services and Third-party Services**

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# Connect to and consume Azure services and third-party services

- Implement API Management
- Develop event-based solutions
- Develop message-based solutions



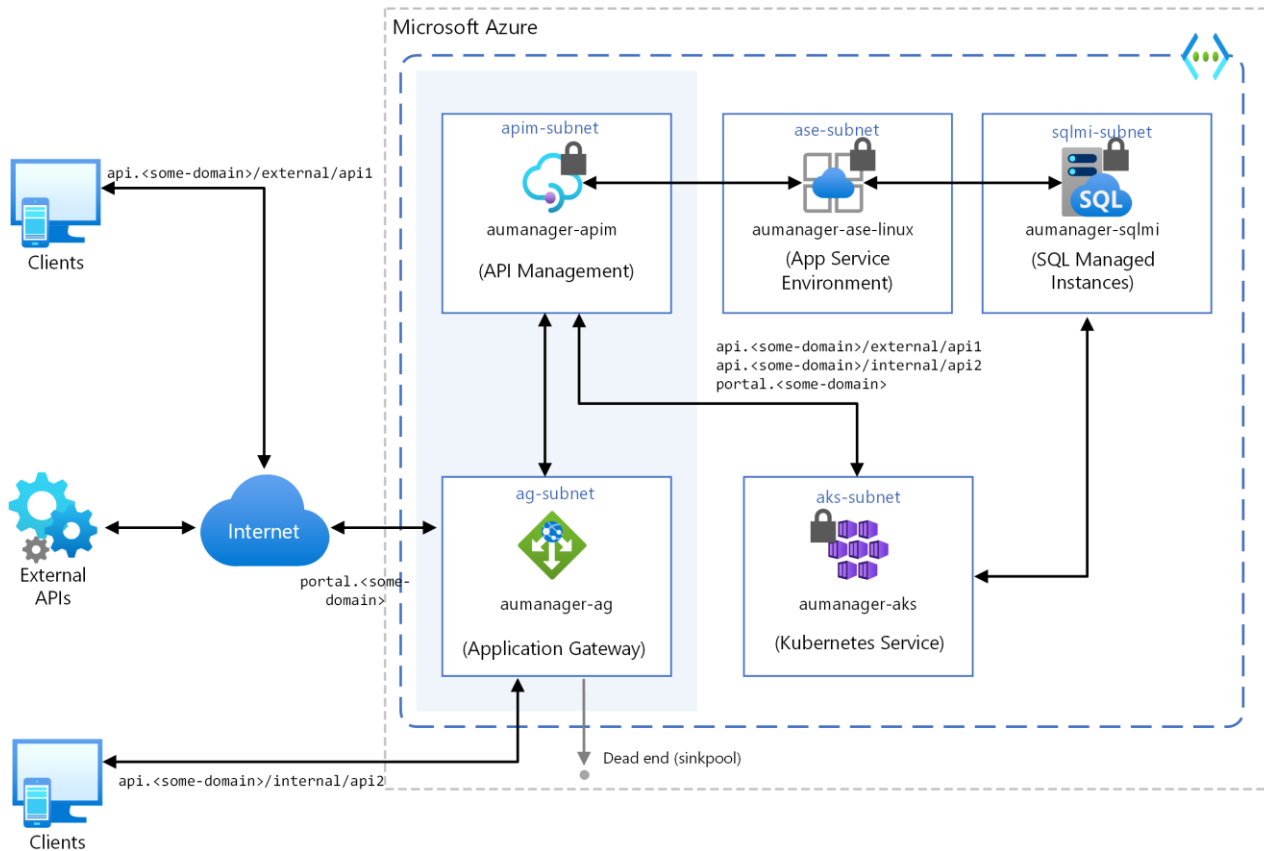
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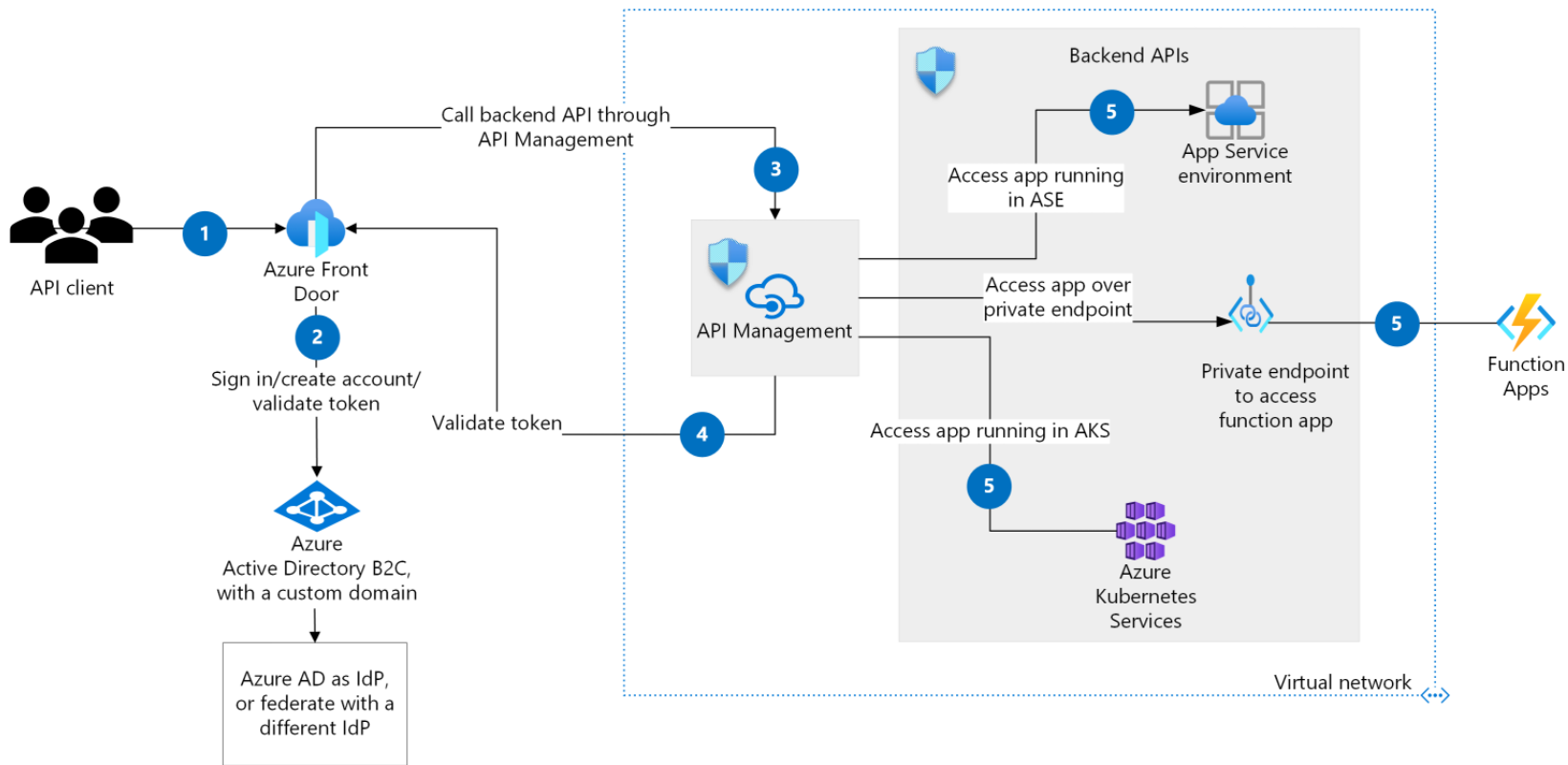
# Implement API Management

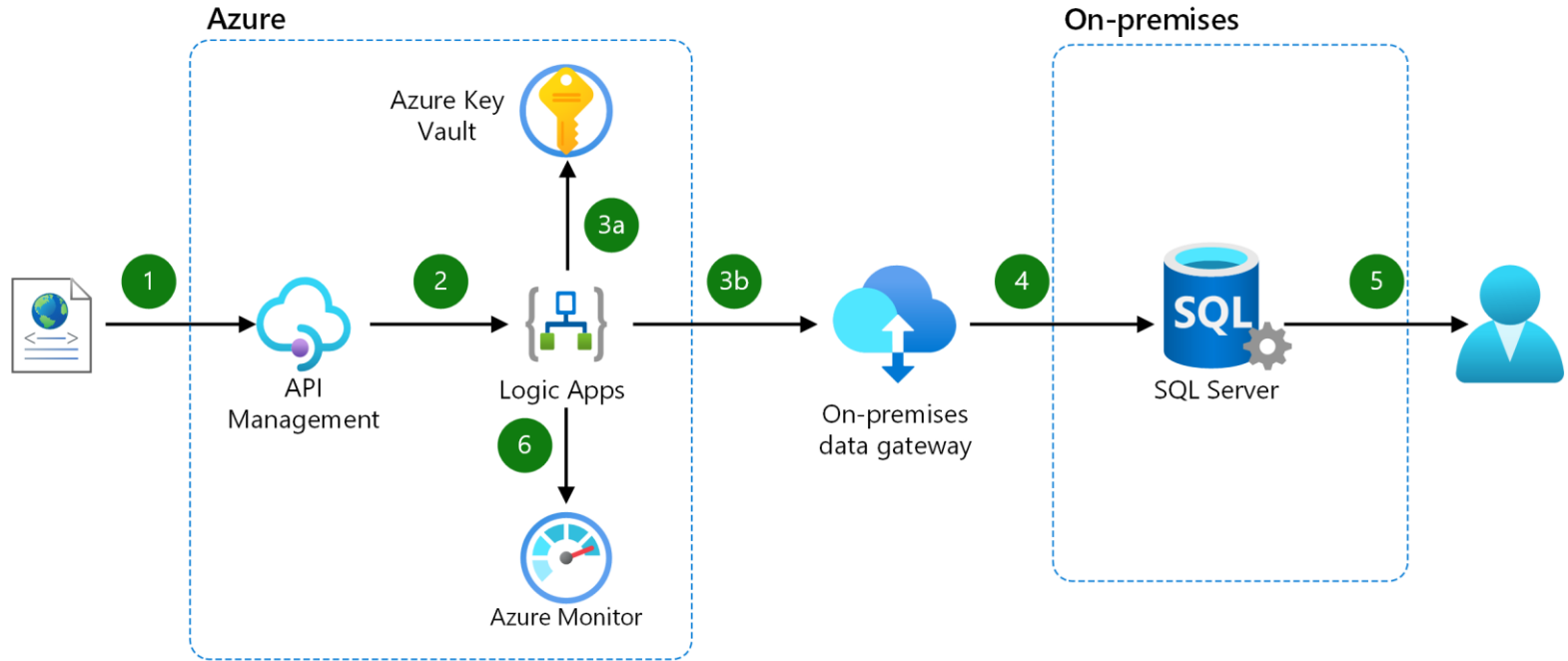
- Create an APIM instance [see [1](#)]
- Create and document APIs [see [1](#)]
- Configure authentication for APIs [see [1](#)]
- Define policies for APIs [see [1](#)]









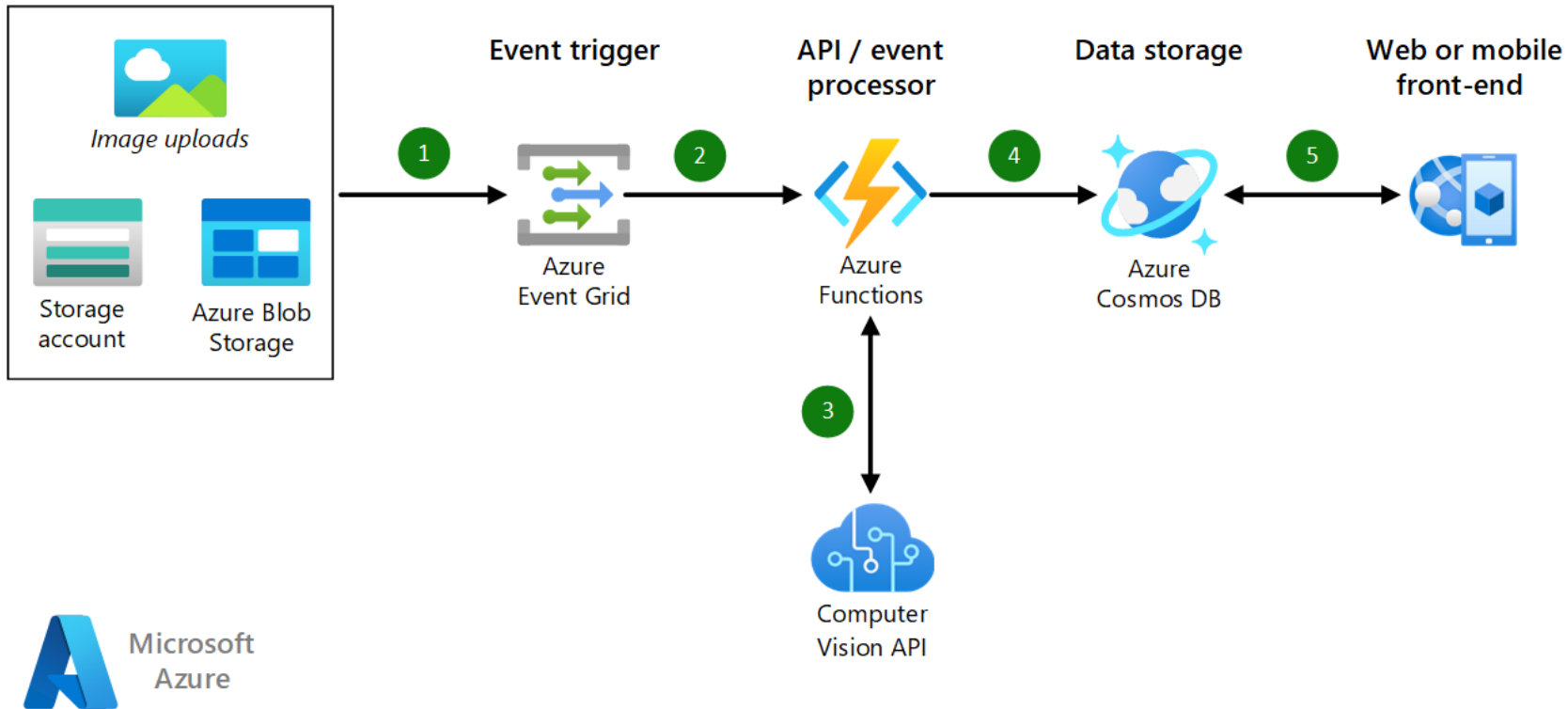


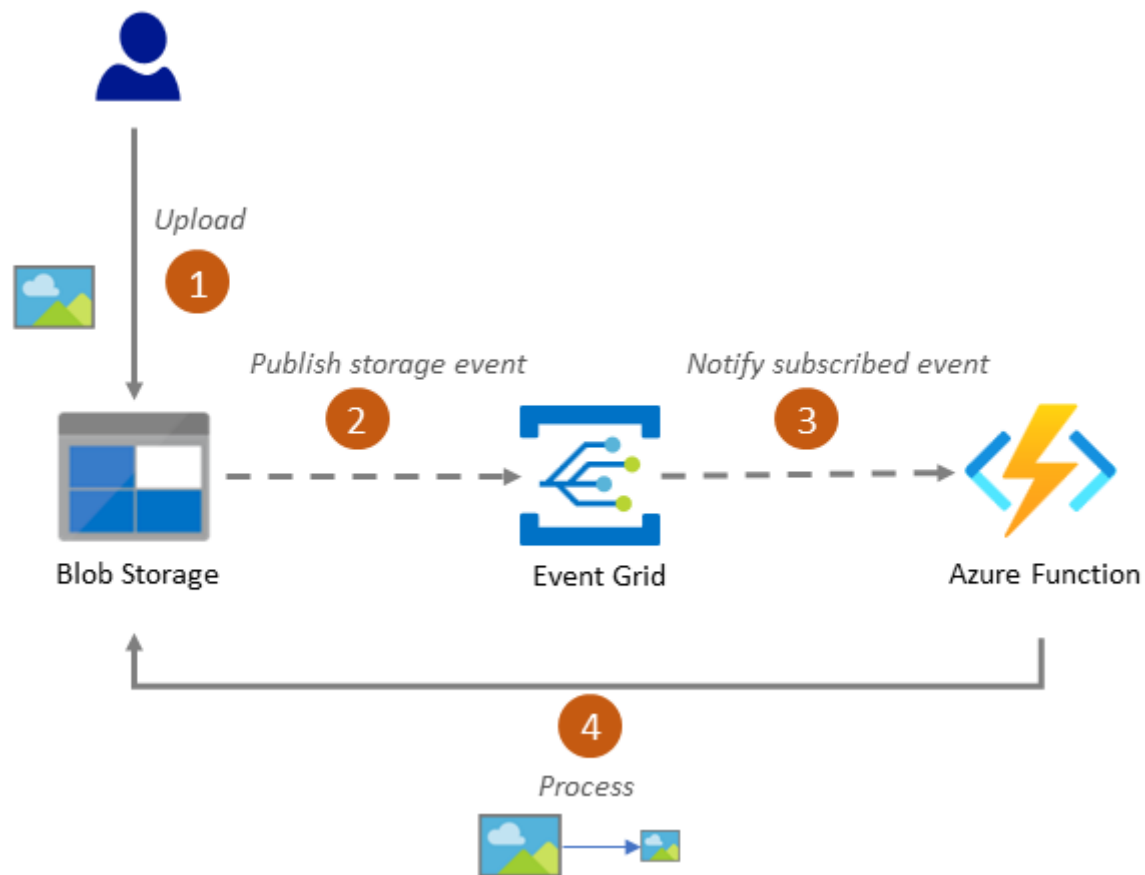
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# Develop event-based solutions

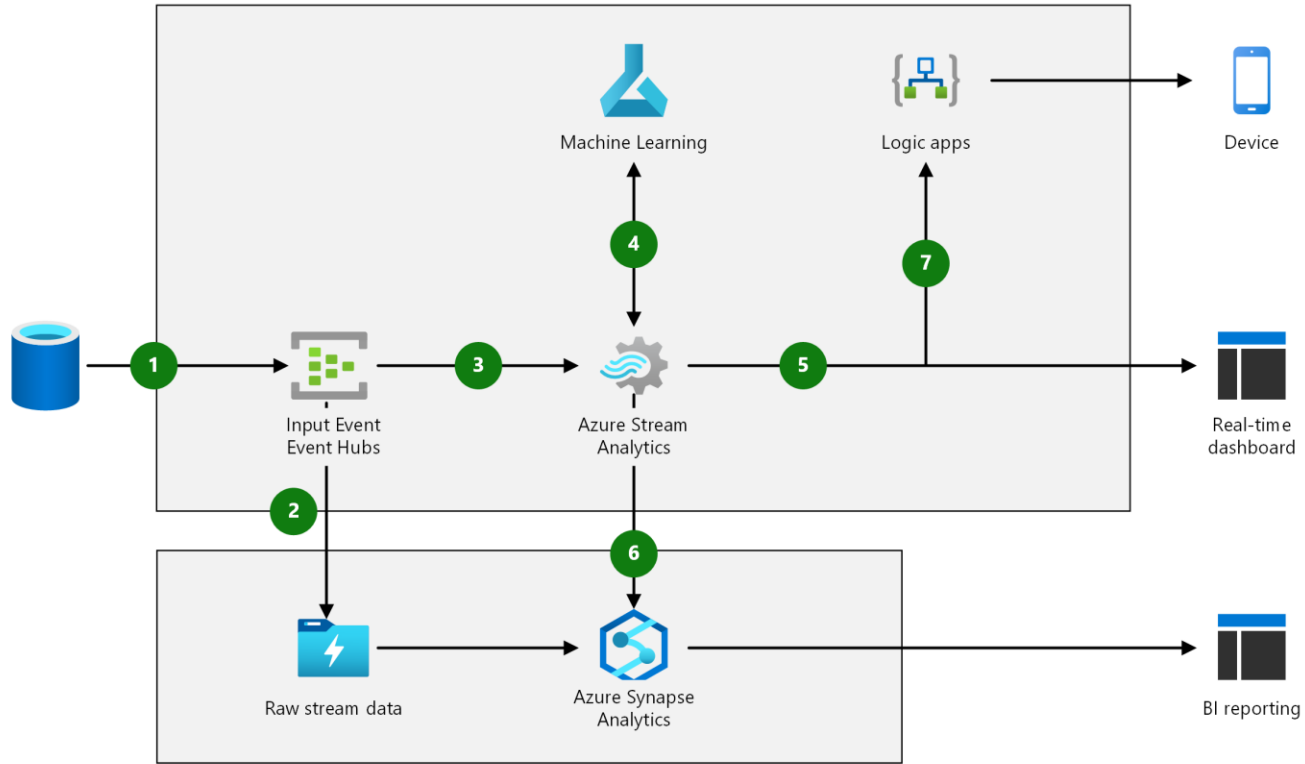
- Implement solutions that use Azure Event Grid [see [1](#) [2](#)]
- Implement solutions that use Azure Notification Hubs [see [1](#) [2](#)]
- Implement solutions that use Azure Event Hubs [see [1](#) [2](#) [3](#) [4](#)]
- Import OpenAPI definitions [see [1](#)]











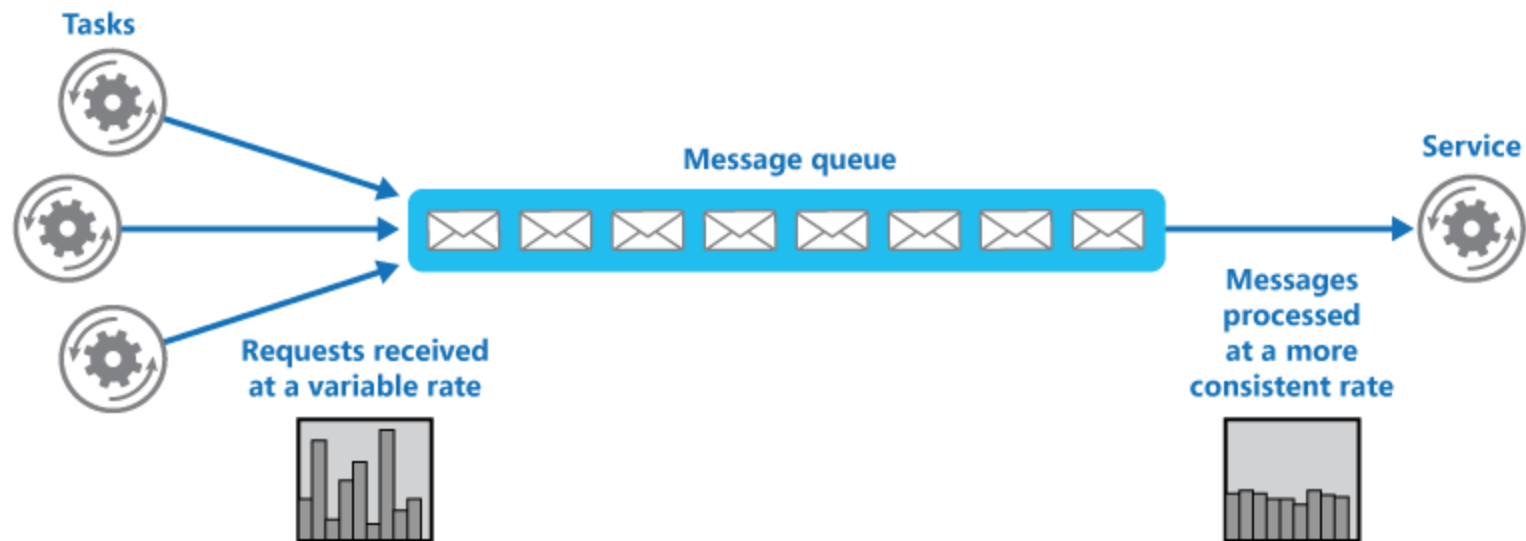


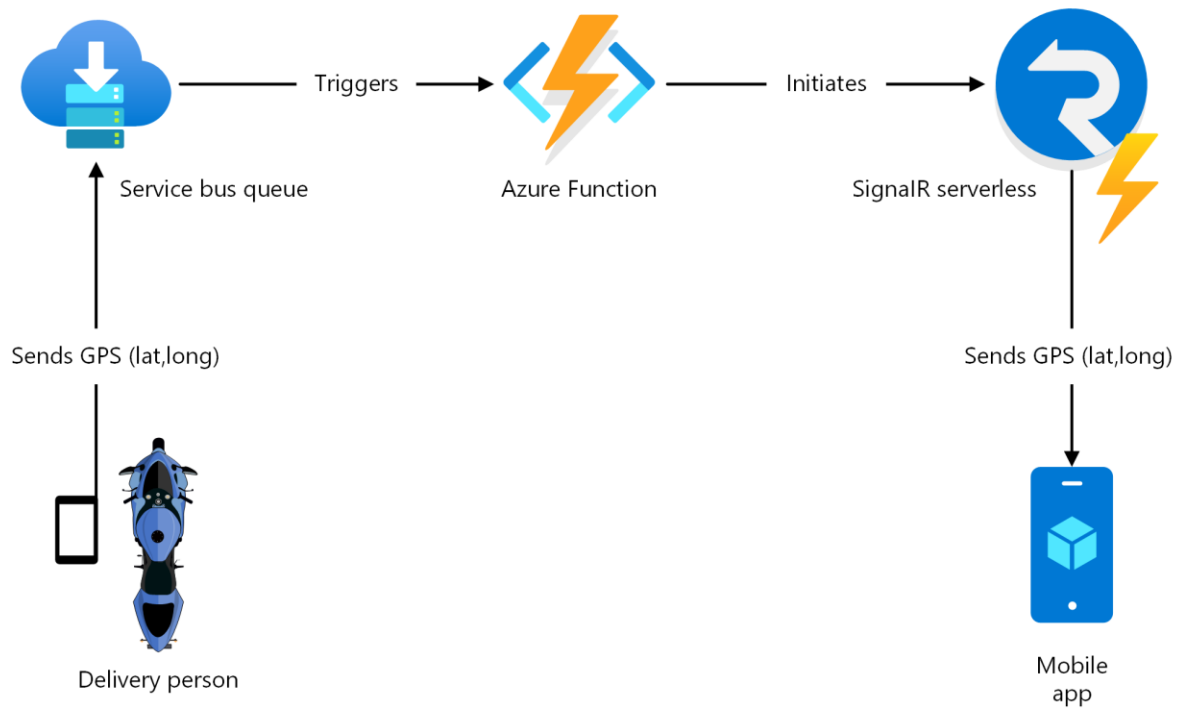
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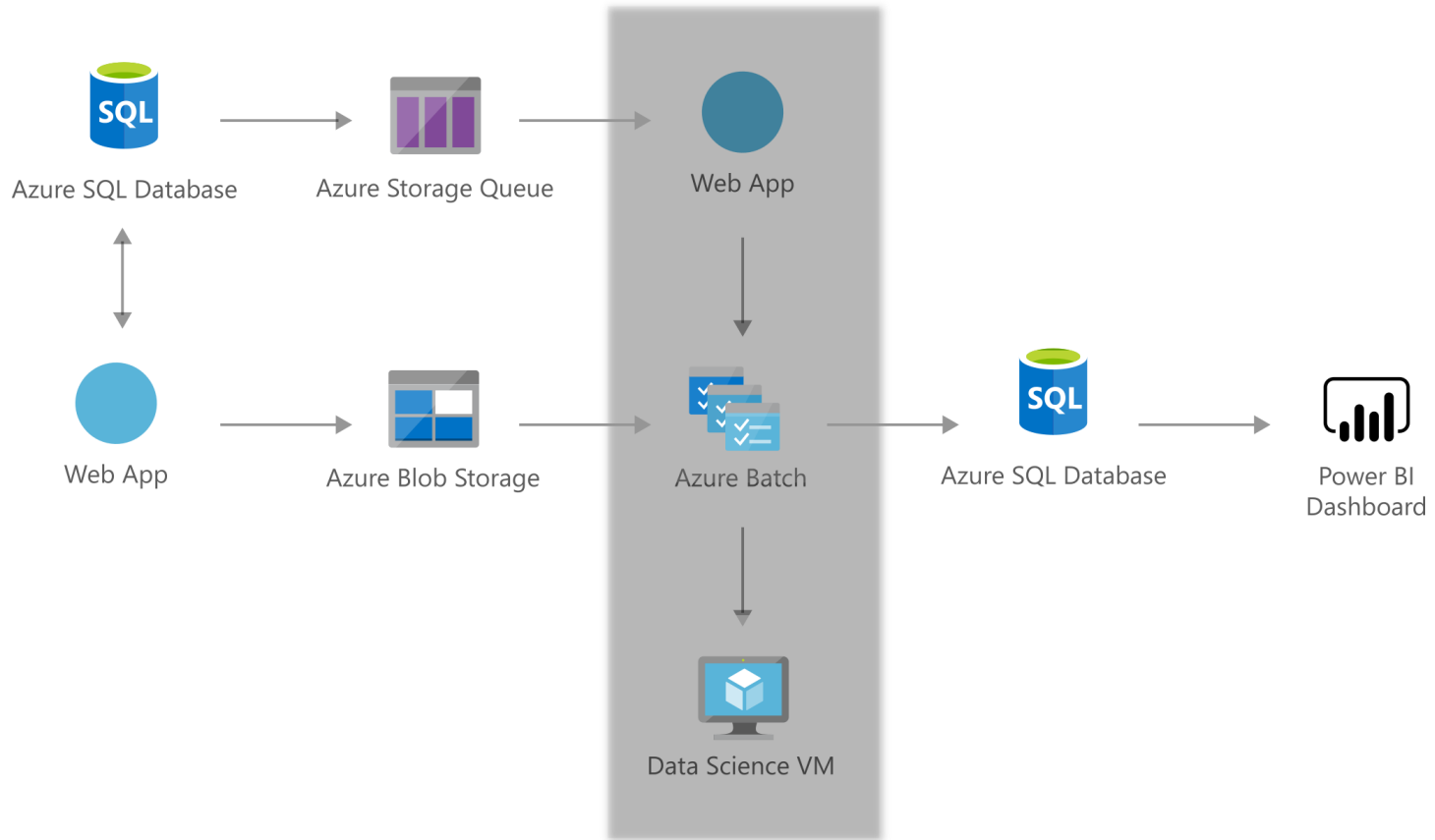
# Develop message-based solutions

- Implement solutions that use Azure Service Bus [see [1](#) [2](#) [3](#) [4](#) [5](#)]
- Implement solutions that use Azure Queue Storage queues [see [1](#) [2](#)]









# The Exam

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# Questions in AZ-204

- 45-55 questions
- Multiple choice
- Drag and drop
- Scenario based
- There will be hands-on labs



# AZ-204

- Exam AZ-204:

<https://docs.microsoft.com/en-us/learn/certifications/exams/az-204>

- Skills measured :

<https://query.prod.cms.rt.microsoft.com/cms/api/am/binary/RE4oZ7B>



# Questions in AZ-204

## 💡 Tip

- Watch **AZ-204 Exam Prep videos** on Learn
- Download the **AZ-204 study guide** [↗](#) to help you prepare for the exam
- Demo the exam experience by visiting our **Exam Sandbox** [↗](#)

**Part of the requirements for:** [Microsoft Certified: Azure Developer Associate](#)

**Related exams:** none

**Important:** [See details](#)

[Go to Certification Dashboard](#) [↗](#)





# Schedule exam

## Exam AZ-204: Developing Solutions for Microsoft Azure

United States



**Languages:** English, Japanese, Chinese (Simplified), Korean, French, German, Spanish, Portuguese (Brazil), Russian, Chinese (Traditional), Italian, Indonesian (Indonesia), Arabic (Saudi Arabia)

**Retirement date:** none

This exam measures your ability to accomplish the following technical tasks: develop Azure compute solutions; develop for Azure storage; implement Azure security; monitor, troubleshoot, and optimize Azure solutions; and connect to and consume Azure services and third-party services. You will be able to select the code language (C# or Python) that's included in the questions when you launch the exam.

**\$165 USD\***

Price based on the country or region in which the exam is proctored.

Schedule exam >

Official practice test for Developing Solutions for Microsoft Azure

All objectives of the exam are covered in depth so you'll be ready for any question on the exam.

+ Save



## Select exam options

AZ-104: Microsoft Azure Administrator

Where do you want to take your exam?



At a test center



Online at my home or office

I have a Private Access Code



Where do you want to take your exam?



At a test center



Online at my home or office

I have a Private Access Code

Prepare for your online exam at your home or office



### Your computer

Use a personal computer that has a reliable webcam and internet connection.

Run [system test](#).



### Your testing space

The room should be a distraction-free, private place.

See [acceptable spaces](#) and view permitted [comfort aid list](#).



### Your photo ID

We'll verify your government-issued identification (ID) when you arrive for your exam.

Review [admission & ID policies](#)



### What to expect

Check in for your OnVUE exam 30 minutes before your appointment time.

Watch our [short video](#) to get familiar with the process.

### Questions?

Check out the [OnVUE FAQs](#) and [minimum technical requirements](#).



## Cart

[Review and confirm](#) contact information to avoid issues on test day.

Description	Details	Price	Actions
		165.00	<a href="#">Remove</a>

### Available Products

In addition to scheduling your exam, you might be interested in the following products.



**Microsoft Official Practice Test powered by MeasureUp - 30 day online access**  
Get a discount on available Microsoft Official Practice Test for Microsoft certification exams (Fundamentals, Role-based, or Specialty) 30-day online access.

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[More Details](#)

USD 80.00

[Add to Order](#)



# It's time to test your system

Order #: 0064-8802-7606

Your appointment is confirmed! An order confirmation containing important exam day information has been sent to: zaalion@gmail.com

## What's next?

Run a system test

We need to verify that the computer and internet connection you plan to use on exam day meet the [minimum requirements](#) for online testing. It'll just take 5 minutes to run:



Equipment and internet connection checks



Exam simulation

### Description

### Details

### Order Information

### Price

165.00



## System Test

☐ I confirm that on my exam day I will be using this same testing space, computer, and internet connection.

**Alert!** Work computers generally have more restrictions that may prevent a successful test. Ensure you are not behind a corporate firewall, and shut down any **Virtual Private Networks (VPNs)** or **Virtual Machines**.

### 1. Copy Access Code

Click '**Copy Access Code**'.

This code will authorize you to perform a system test.

690-635-235

Copy Access Code

### 2. Download OnVUE

Click '**Download**'.

Download

### 3. Run OnVUE

Run the OnVUE application from your Downloads folder.



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# Course Repository

<https://github.com/zaalion/oreilly-az-204>



**O'REILLY<sup>®</sup>**

**Thank you!**

**Reza Salehi**

**@zaalion**

