O'REILLY®

Microsoft Azure Developer Associate (AZ-204) Crash Course

Developing Solutions for Microsoft Azure

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@zaalion

Course Overview

AZ-204 Skills Measured

Exam AZ-204: Developing Solutions for Microsoft Azure

Questions & Resources

- Please post questions in the Q&A box

- The course repository

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

- Reach out:

  - Twitter: @zaalion

AZ-204 Candidate Profile

- Professionals who:

  - Have subject matter expertise designing, building,

    testing, and maintaining cloud applications and

    services on Microsoft Azure.

Azure Data Engineers

- Should have 1-2 years professional development experience

- Experience with Microsoft Azure

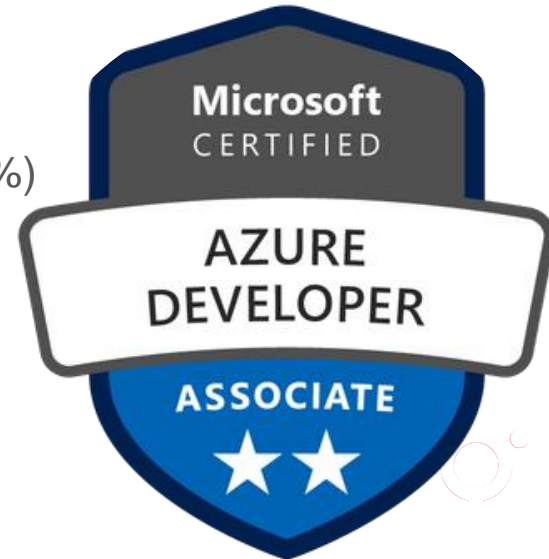- Can program in a language supported by Azure

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%)

Course Repository

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

Develop Azure Compute Solutions

Develop Azure Compute Solutions

- **Implement IaaS solutions**

- **Create Azure App Service Web Apps**

- **Implement Azure functions**

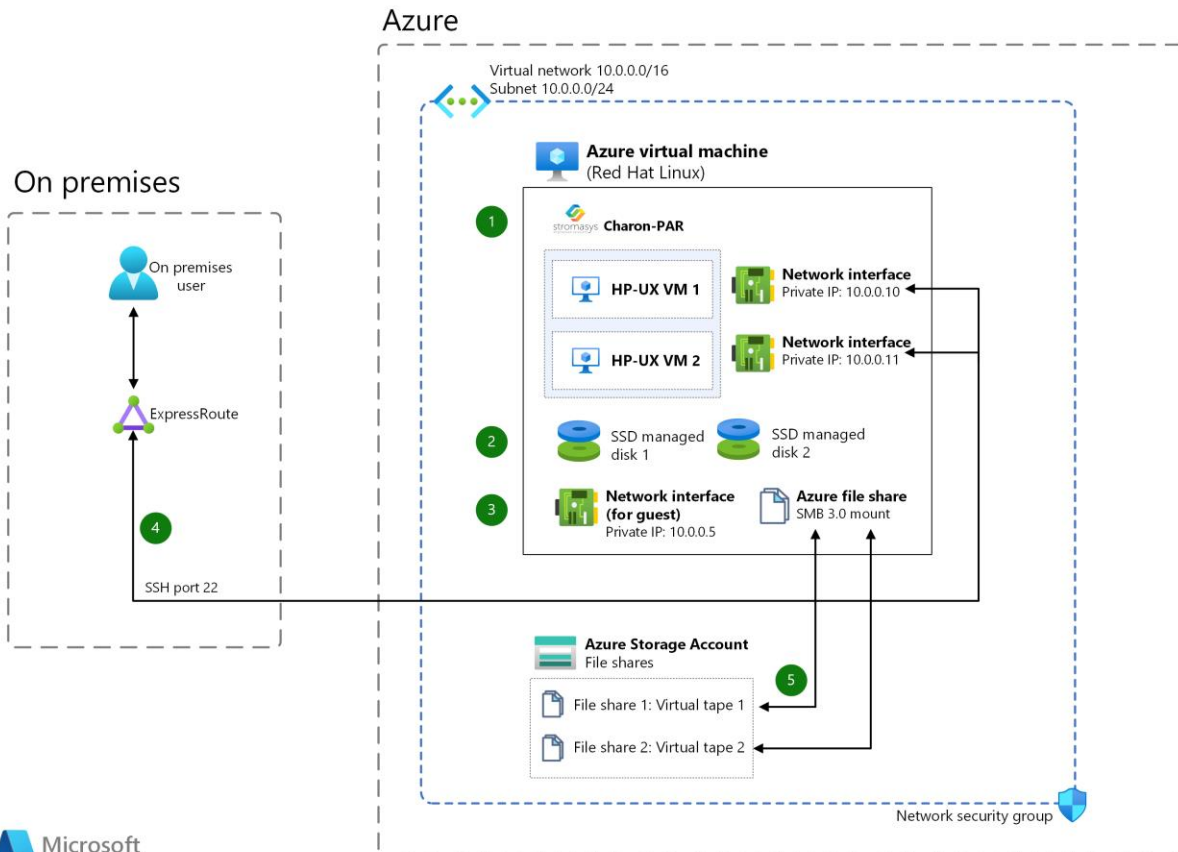# Implement IaaS solutions

- 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

Hub virtual network

Peered Virtual Networks

Spoke virtual network

Azure Bastion

Resource subnet

VM

VM

On-premises network

VM

VM

VM

Azure Firewall

Local Network Gateway

VPN Connection

Virtual Network Gateway

IPSec / IKE Tunnel

Virtual Network Gateway

VPN Connection

Local Network Gateway

Azure Monitor
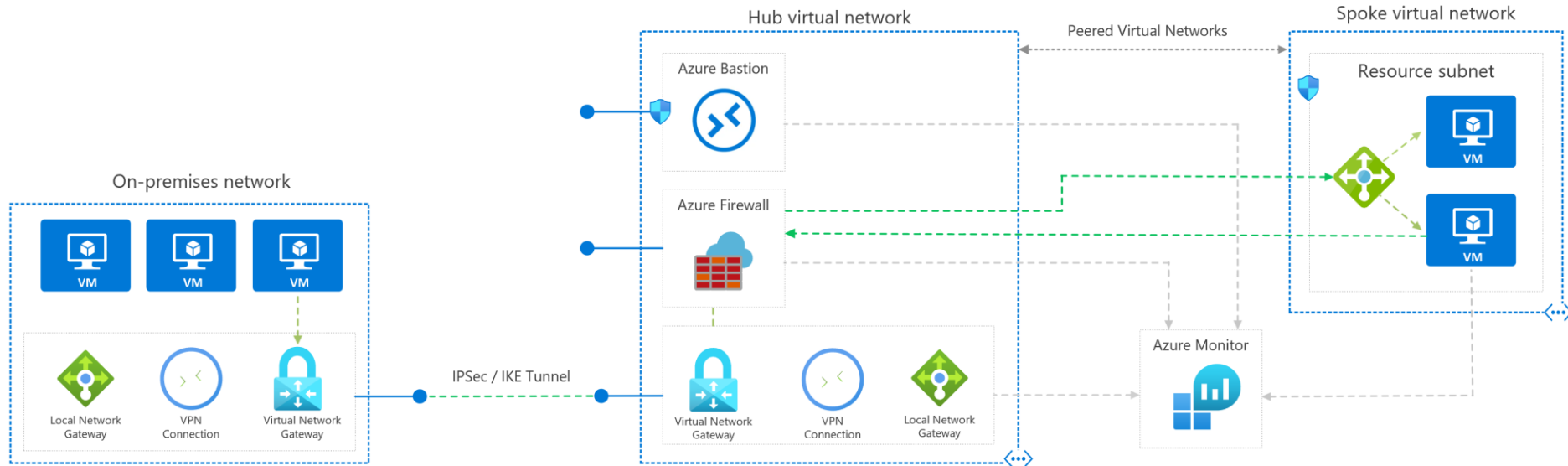
ARM Templates

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

JSON　　Copy

Host Your Code in ACI

Package your app into a Docker image

Push the image

Azure Container Registry

Internet

Other Azure services

Azure Container Instances

Pulls the container image

https://docs.microsoft.com/en-us/azure/container-instances/container-instances-overview
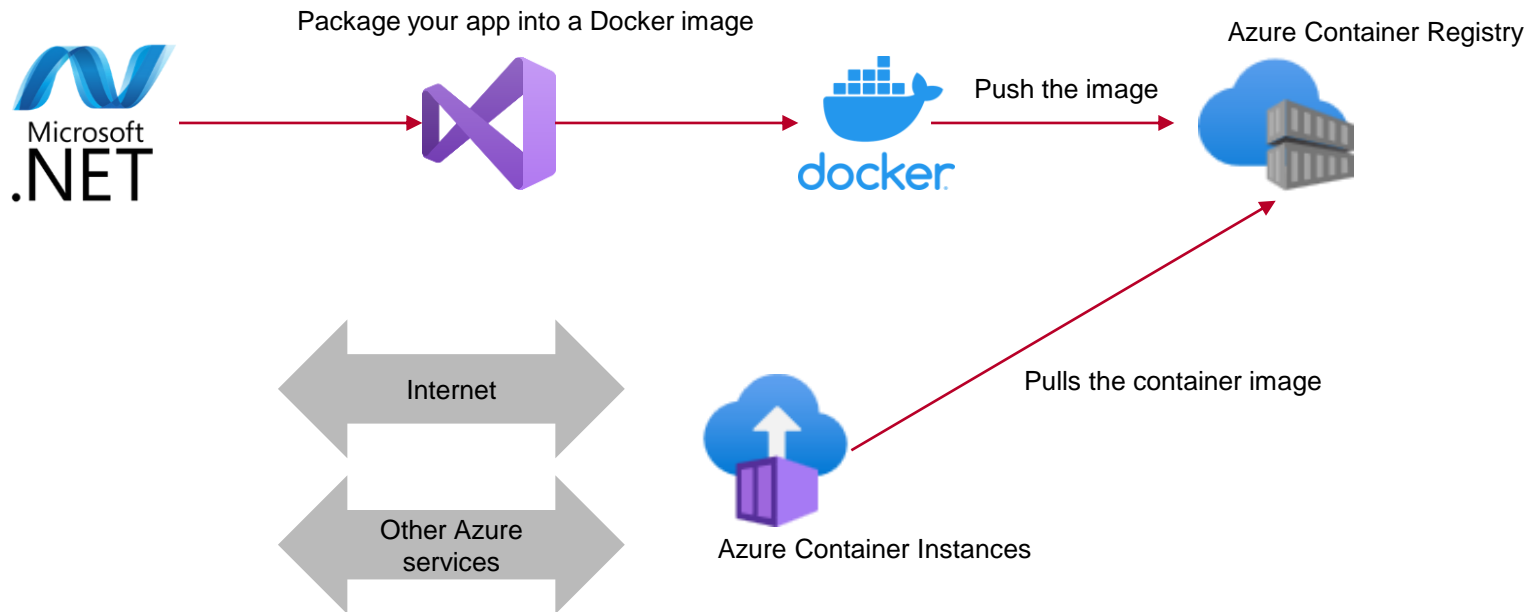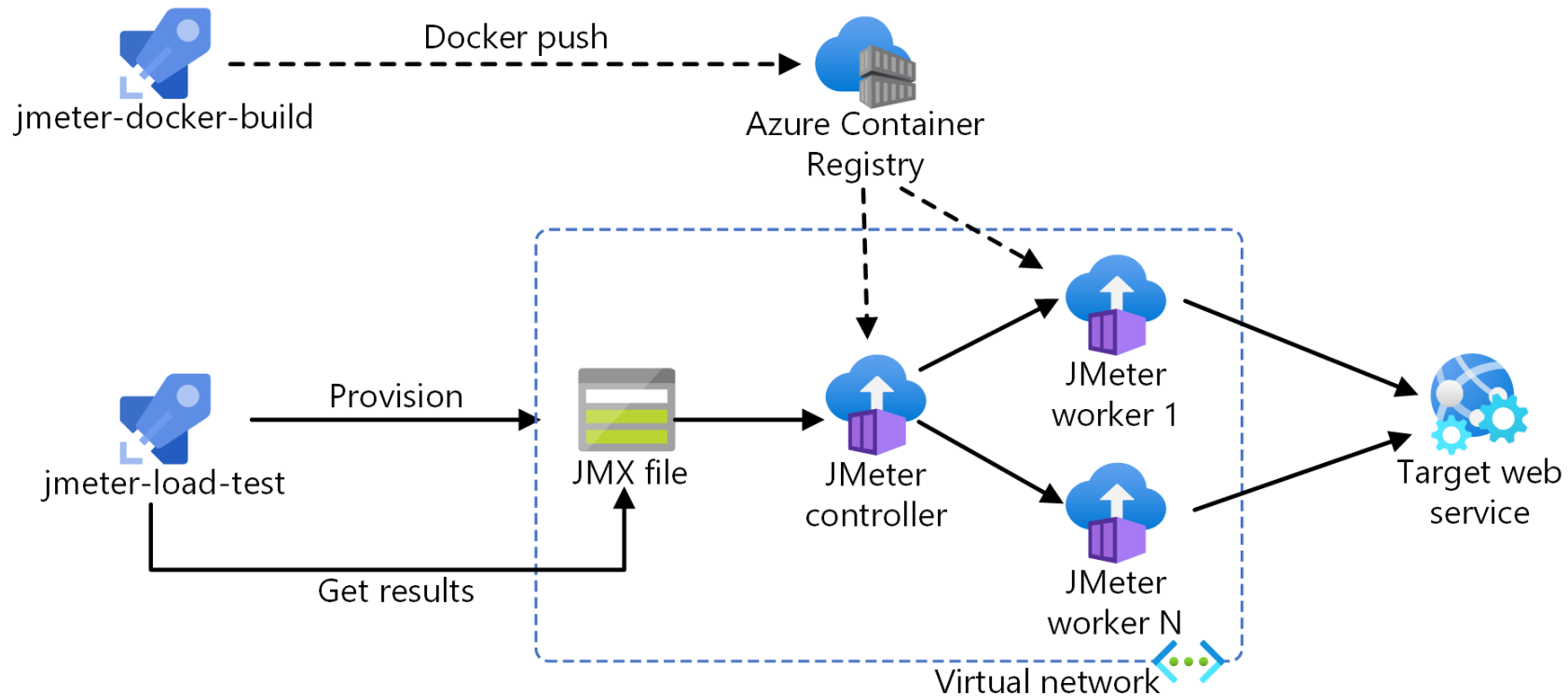
Create Azure App Service Web Apps

- 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]

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

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

https://docs.microsoft.com/en-us/azure/app-service/overview
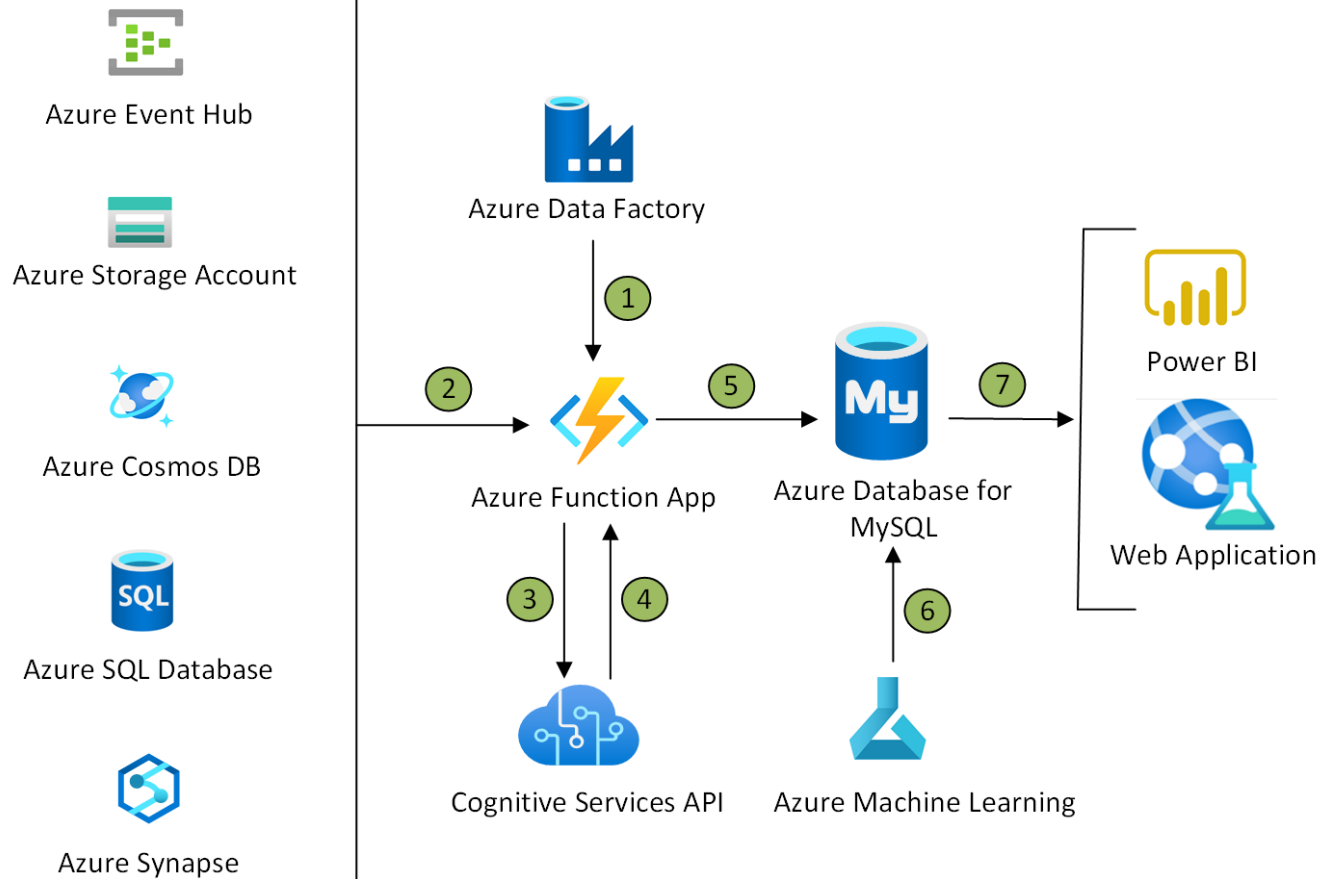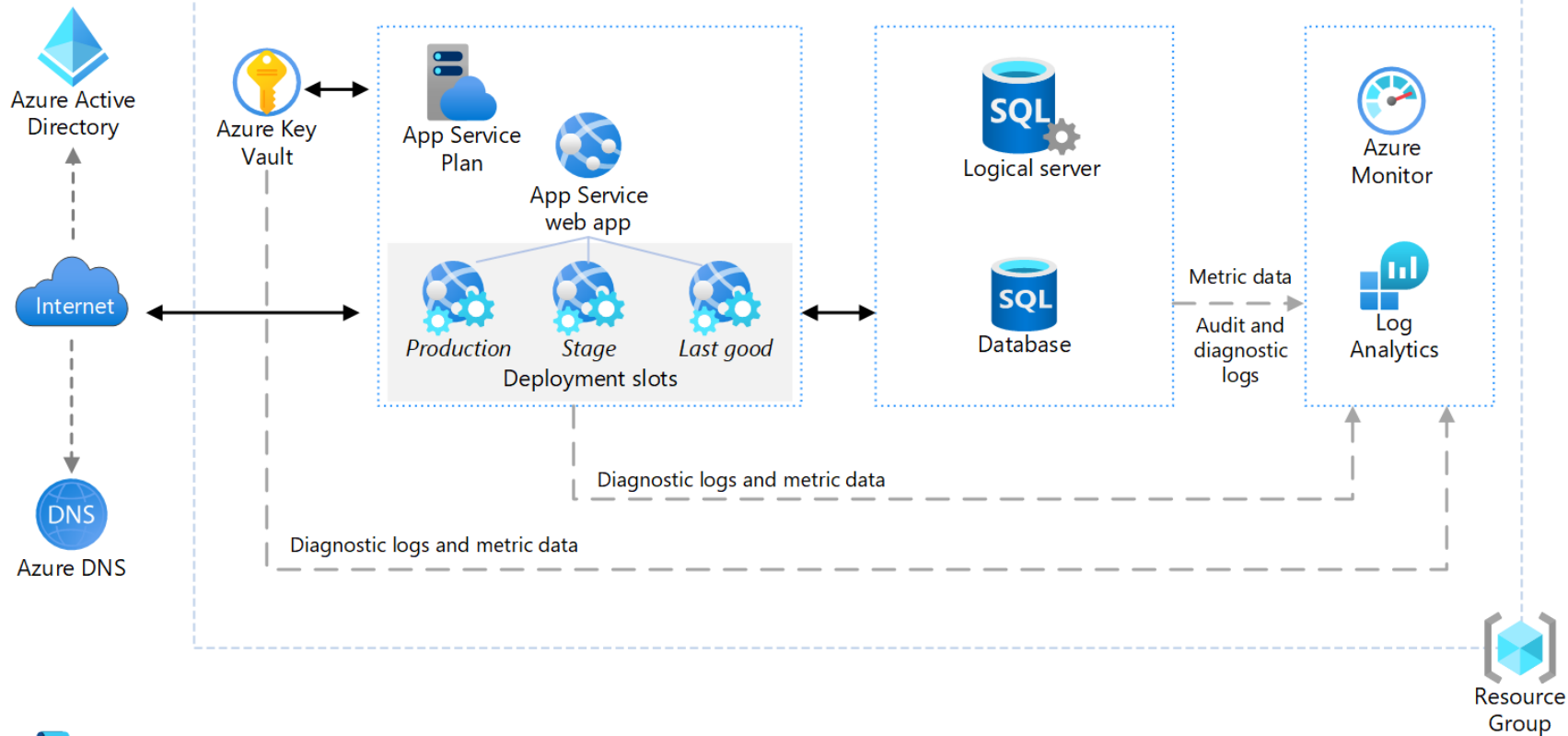
Implement Azure functions

- 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]

Azure Functions

- Run isolated pieces of code in a serverless solution.

- Best to host microservices and APIs (HTTP, and other types)

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

https://docs.microsoft.com/en-us/azure/azure-functions/functions-overview
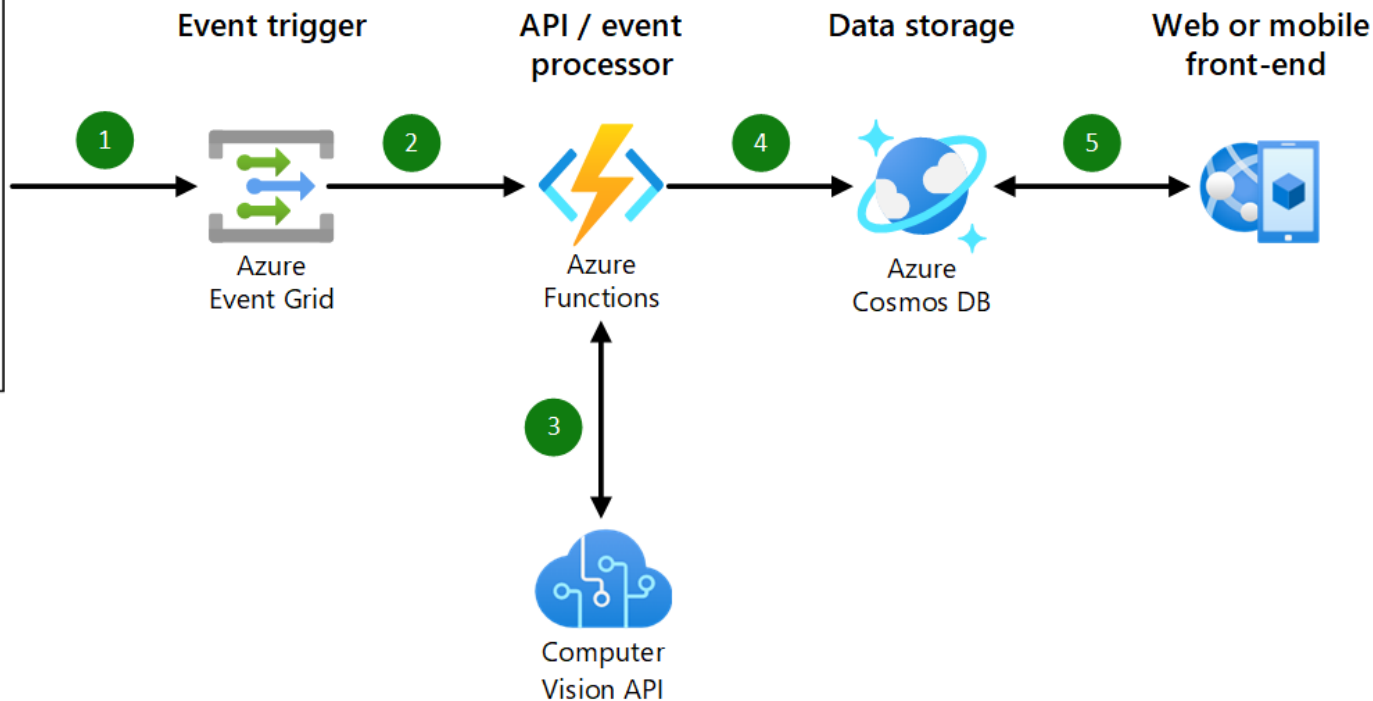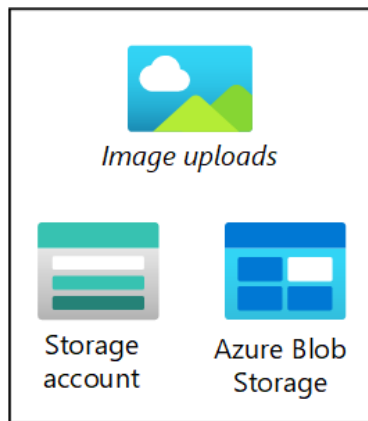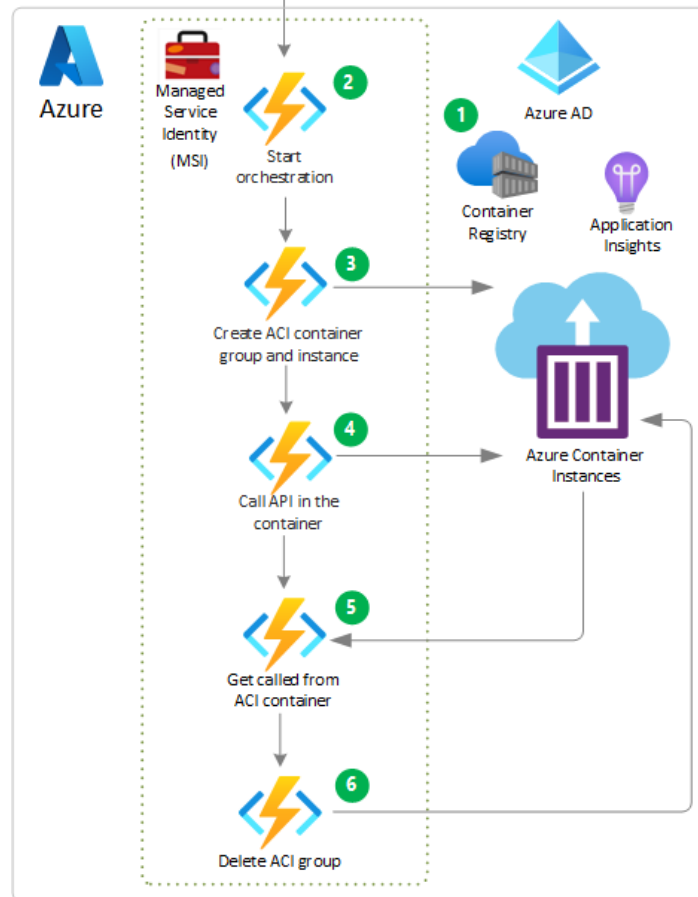
Develop for Azure Storage

Design Azure Data Storage Solutions

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

- **Develop solutions that use blob storage**

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]

Consistency Levels in Azure Cosmos DB
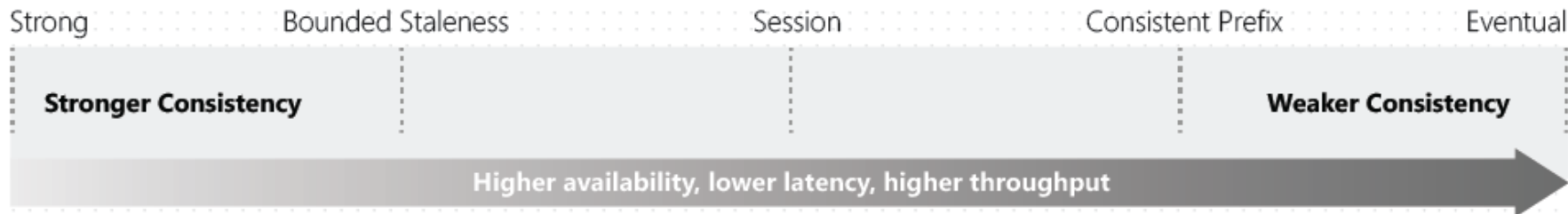
Event-Computing and Notifications
Retail, Gaming, Content management

Azure
Functions

Azure
Notification Hubs

Azure
App Service

Stream Processing
IoT processing, Data Science & analytics

Azure
Stream Analytics

Azure
HDInsight

APACHE
Spark

Apache
Spark

APACHE
STORM™

Apache
Storm

Data movement
Enterprise data management

Azure
Storage Blob

Azure
Storage Table

Azure
Data Lake

Azure
Cosmos DB

Azure Cosmos DB

Change Feed

Sources

Trigger call to an API
when a document is
inserted or modified

Real-time (stream)
processing of data

Zero-downtime
migrations

Physical Partition

Leader

Follower | Follower | Forwarder

Containers

partition key = "city"

Logical Partitions

"city" : "London" | "city" : "NYC" | "city" : "Paris" | "city" : "Rome"

Partition Set

Region 1

Physical Partitions

Region 2

Local distribution - Redundancy within regions

Region n

Global distribution - Redundancy across regions

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]

Azure Storage Account

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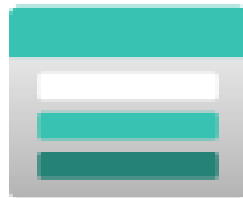
Azure Storage Account

- 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)

https://docs.microsoft.com/en-us/azure/storage/common/storage-account-overview

Azure Storage Services

Azure Storage Account

VM Disks   Blobs   Tables   Queues   File Share

https://docs.microsoft.com/en-us/azure/storage/common/storage-introduction
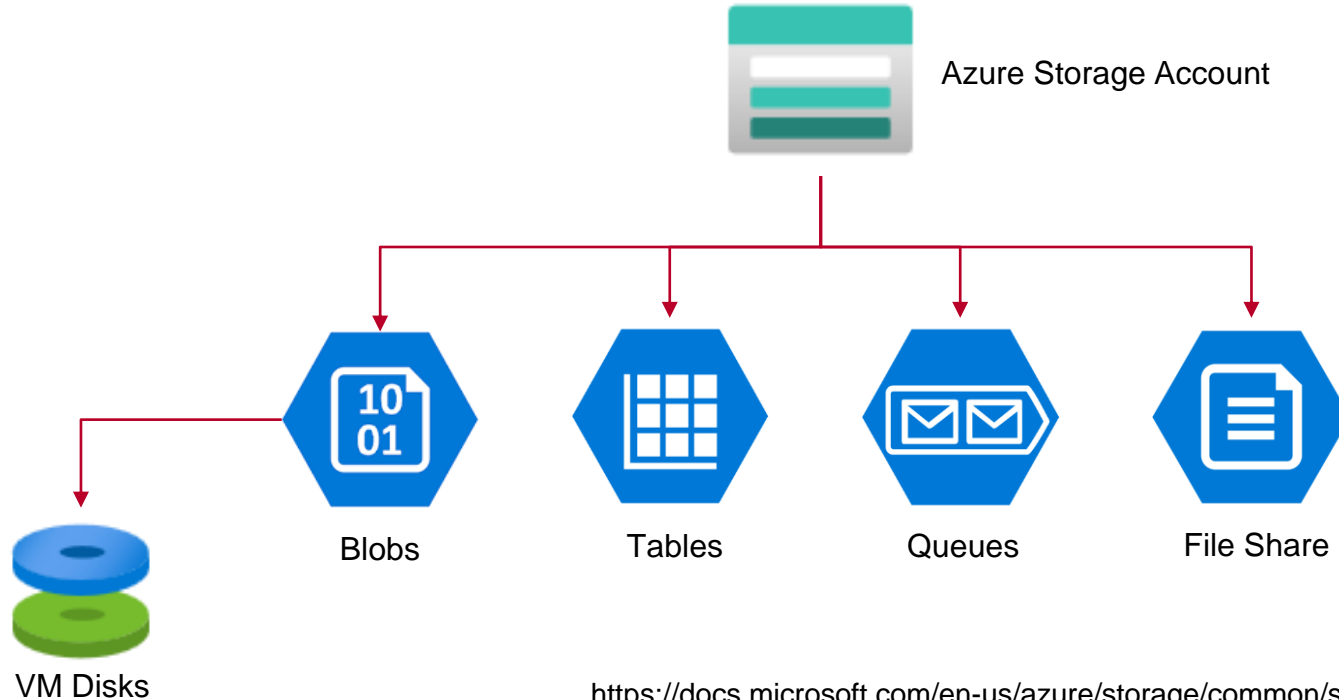
Azure Storage Account: Blobs

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

All mobile-phone call metadata → **1** → Event Hubs → **2** → Stream Analytics (**3**) → **4** → Fraudulent call metadata (Blob Storage)

Microsoft Azure

Mezzanine Video Files

Azure Encoder (Standard or Premium)

Azure Blob Storage

Streaming Endpoint

Multi-Protocol Dynamic Packaging/ Multi-DRM

Azure CDN

Azure Media Player in Browser

Token

License/Key

Cloud DRM License/Key Delivery Server

Azure Media Player in Mobile App

License/Key

Token

Implement Azure Security

Implement Azure Security

- **Implement user authentication and authorization**

- **Implement secure cloud solutions**

Implement user authentication and authorization

- Authenticate and authorize users by using the Microsoft Identity platform

  [see 1 2 3 4]

- 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]

Microsoft identity platform

http://aka.ms/IdentityPlatform

What type of app are you building?

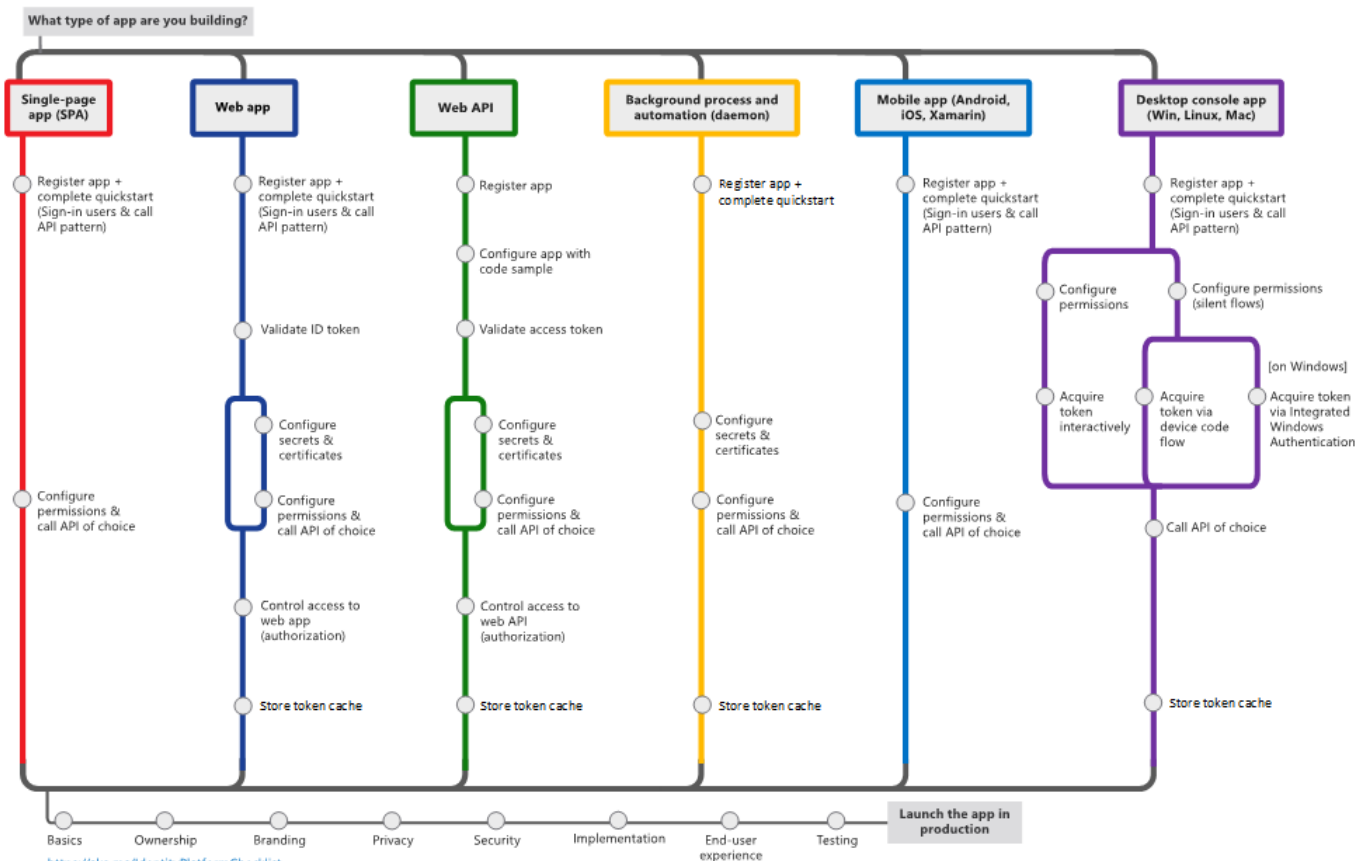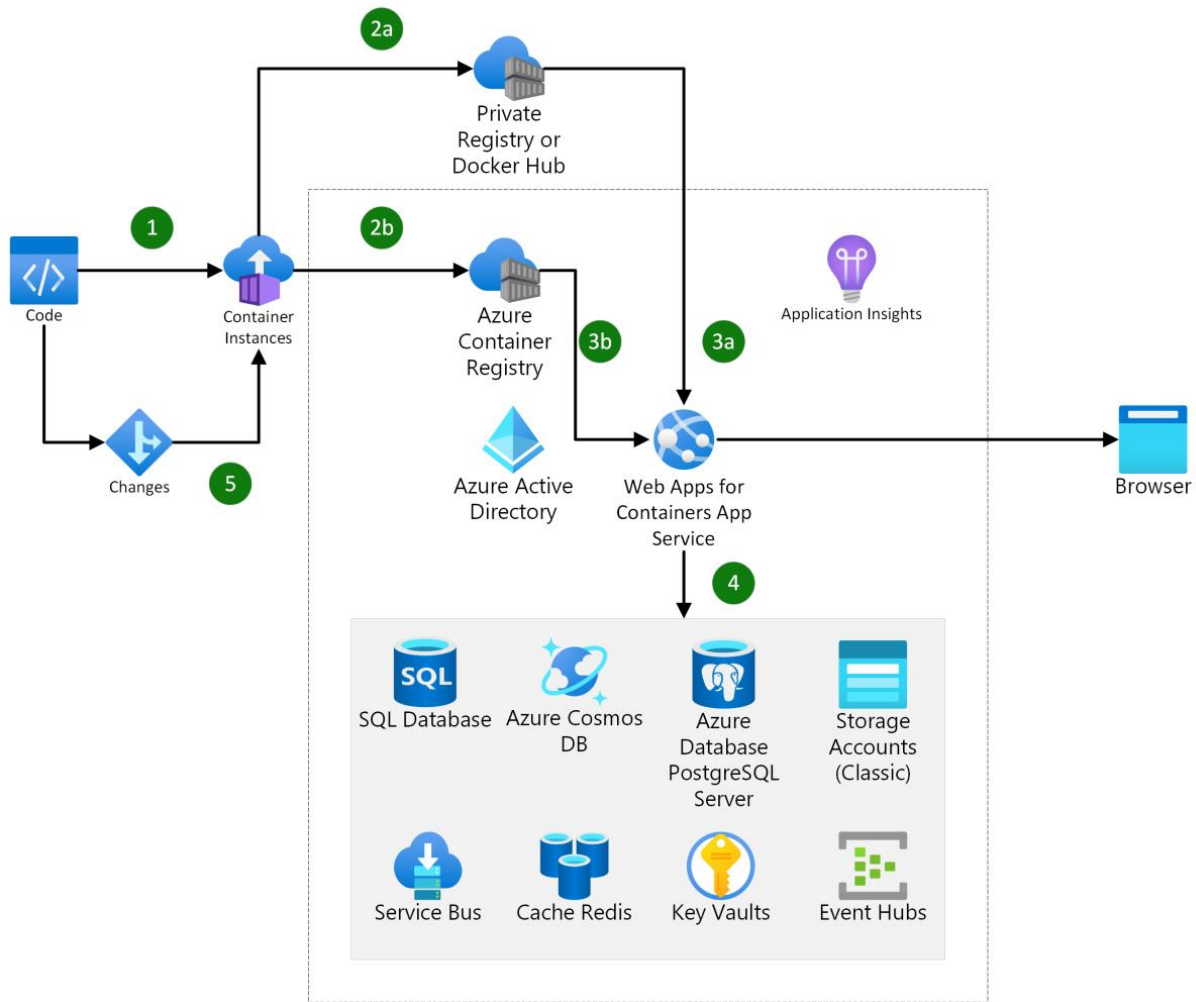| Single-page app (SPA)	Web app	Web API	Background process and automation (daemon)	Mobile app (Android, iOS, Xamarin)	Desktop console app (Win, Linux, Mac)
Register app + complete quickstart (Sign-in users & call API pattern)	Register app + complete quickstart (Sign-in users & call API pattern)	Register app	Register app + complete quickstart	Register app + complete quickstart (Sign-in users & call API pattern)	Register app + complete quickstart (Sign-in users & call API pattern)
		Configure app with code sample			Configure permissions / Configure permissions (silent flows)
	Validate ID token	Validate access token			[on Windows]
	Configure secrets & certificates	Configure secrets & certificates	Configure secrets & certificates		Acquire token interactively / Acquire token via device code flow / Acquire token via Integrated Windows Authentication
Configure permissions & call API of choice	Configure permissions & call API of choice	Configure permissions & call API of choice	Configure permissions & call API of choice	Configure permissions & call API of choice	Call API of choice
	Control access to web app (authorization)	Control access to web API (authorization)			
	Store token cache	Store token cache	Store token cache		Store token cache

Launch the app in production

Basics — Ownership — Branding — Privacy — Security — Implementation — End-user experience — Testing
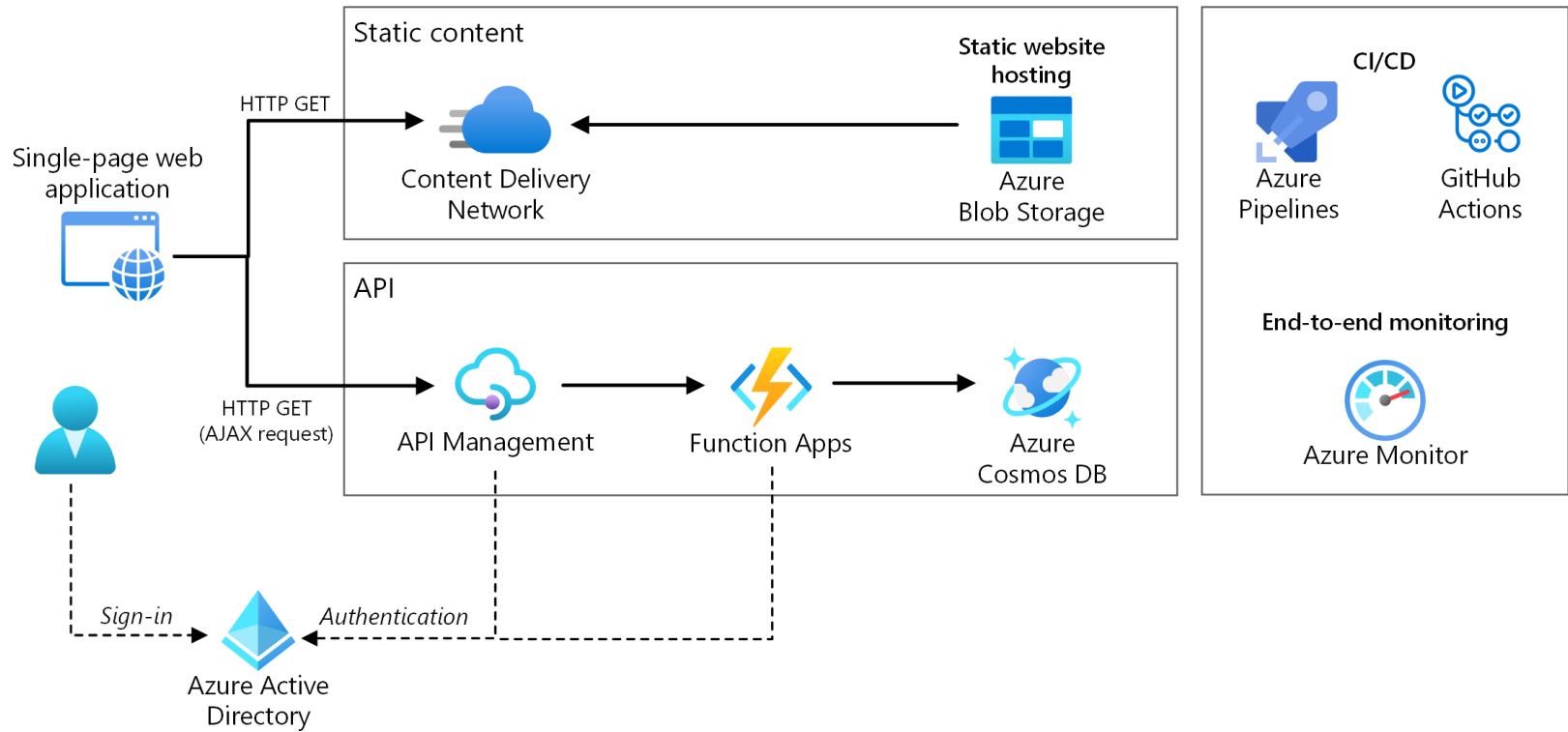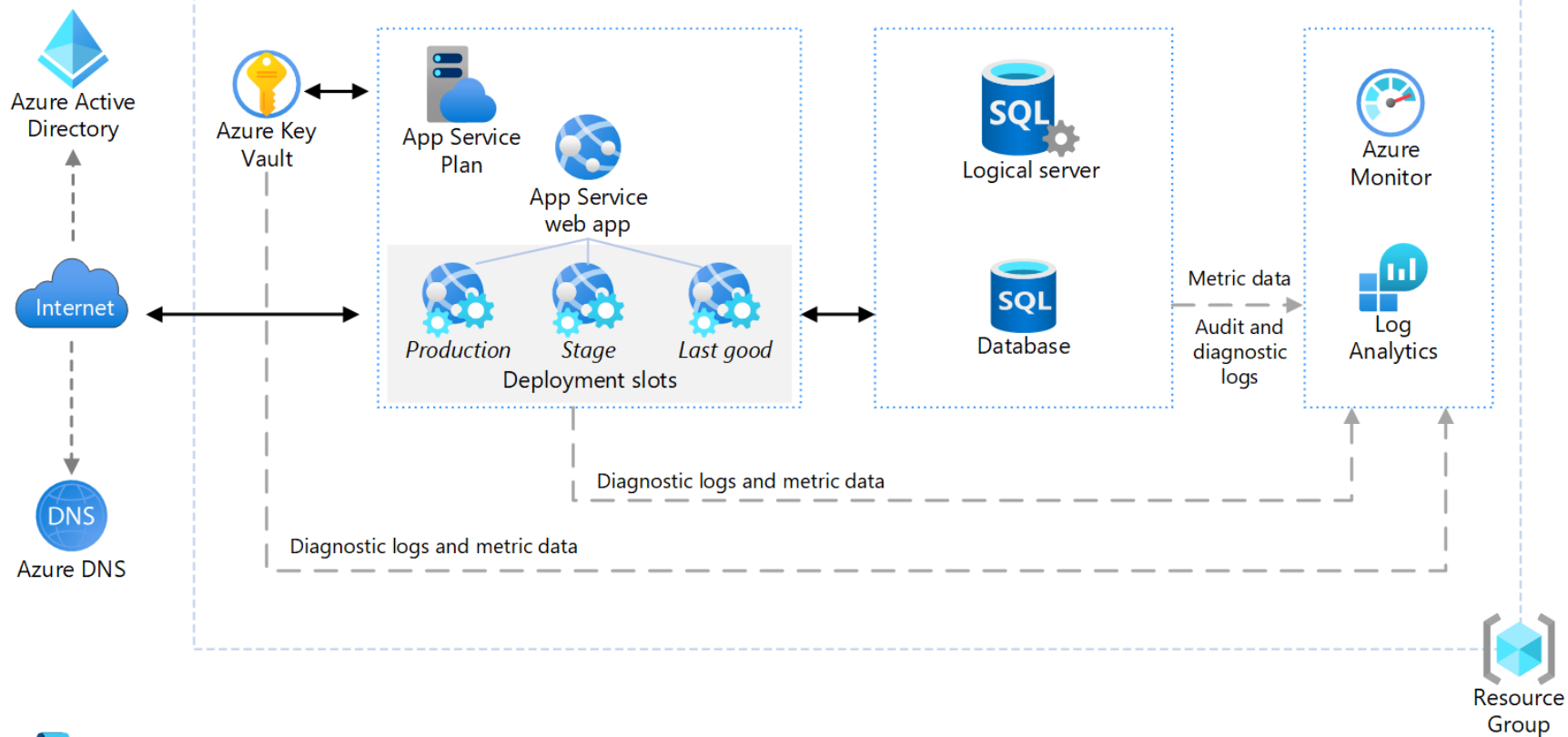
https://aka.ms/IdentityPlatformChecklist

Microsoft

Implement secure cloud solutions

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

  [see 1]

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

  Vault [see 1 2 3]

Azure Active Directory

Azure Key Vault

Internet

App Service Plan

App Service web app

Production Stage Last good
Deployment slots

Logical server

SQL Database

Metric data

Audit and diagnostic logs

Azure Monitor

Log Analytics

Diagnostic logs and metric data

Diagnostic logs and metric data

DNS

Azure DNS

Resource Group

Microsoft Azure

Monitor, Troubleshoot, and Optimize Azure Solutions

Monitor, Troubleshoot, and Optimize

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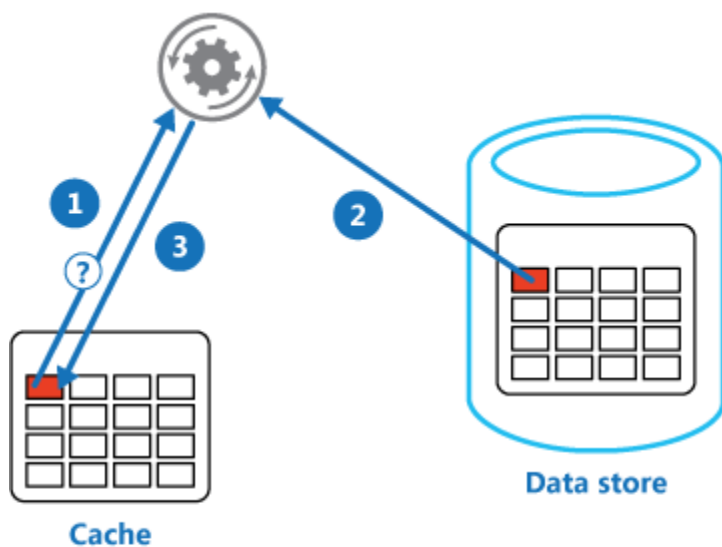
- **Troubleshoot solutions using metrics and log data**

Implement caching for solutions

- Configure cache and expiration policies for Azure Cache for Redis [see 1 2]

- Implement secure and optimized application cache patterns including data

  sizing, connections, encryption, and expiration [see 1]

Cache

Data store

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.

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]

Azure Repos

Azure DevOps (Build) Pipeline

Azure DevOps (Release) Pipeline

Azure Web Apps

Visual Studio

Engineer

Azure Application Insights

Azure DevOps Backlog

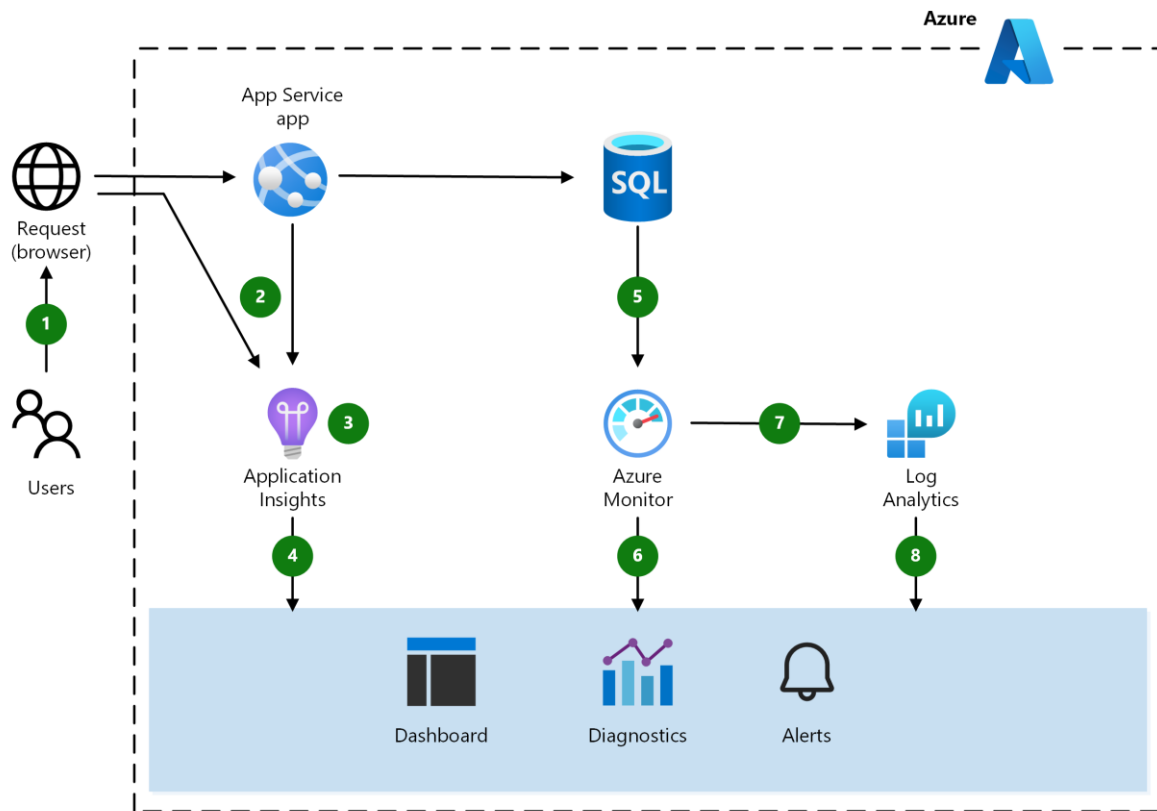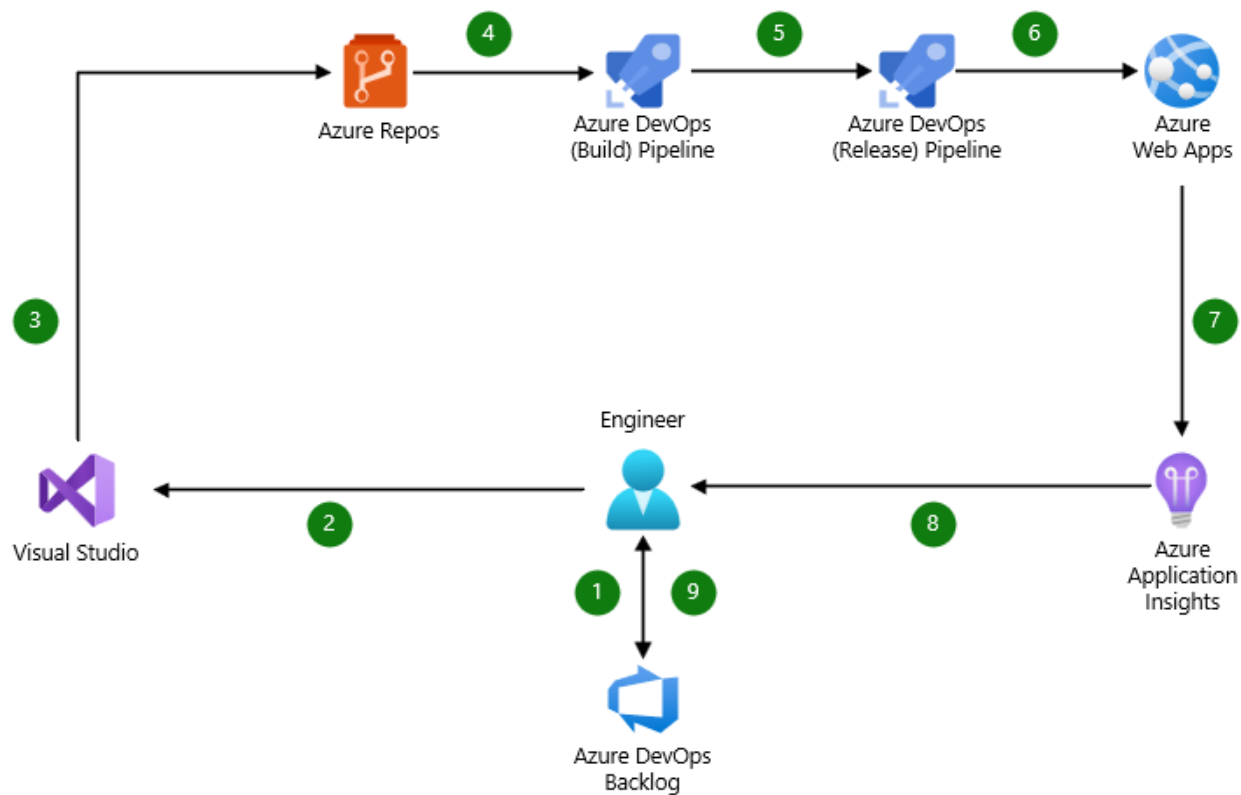Microsoft Azure

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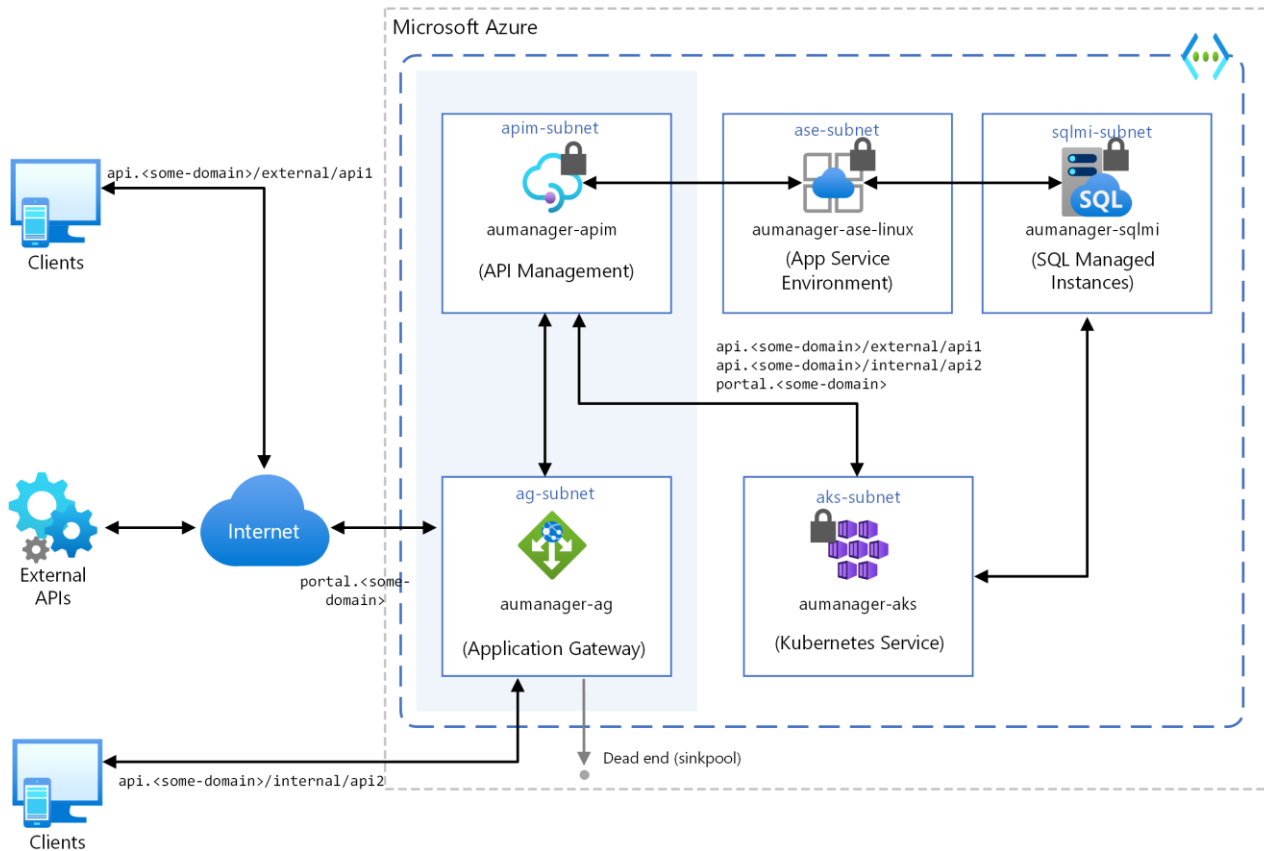
Consume Azure and Third-party Services

- **Implement API Management**

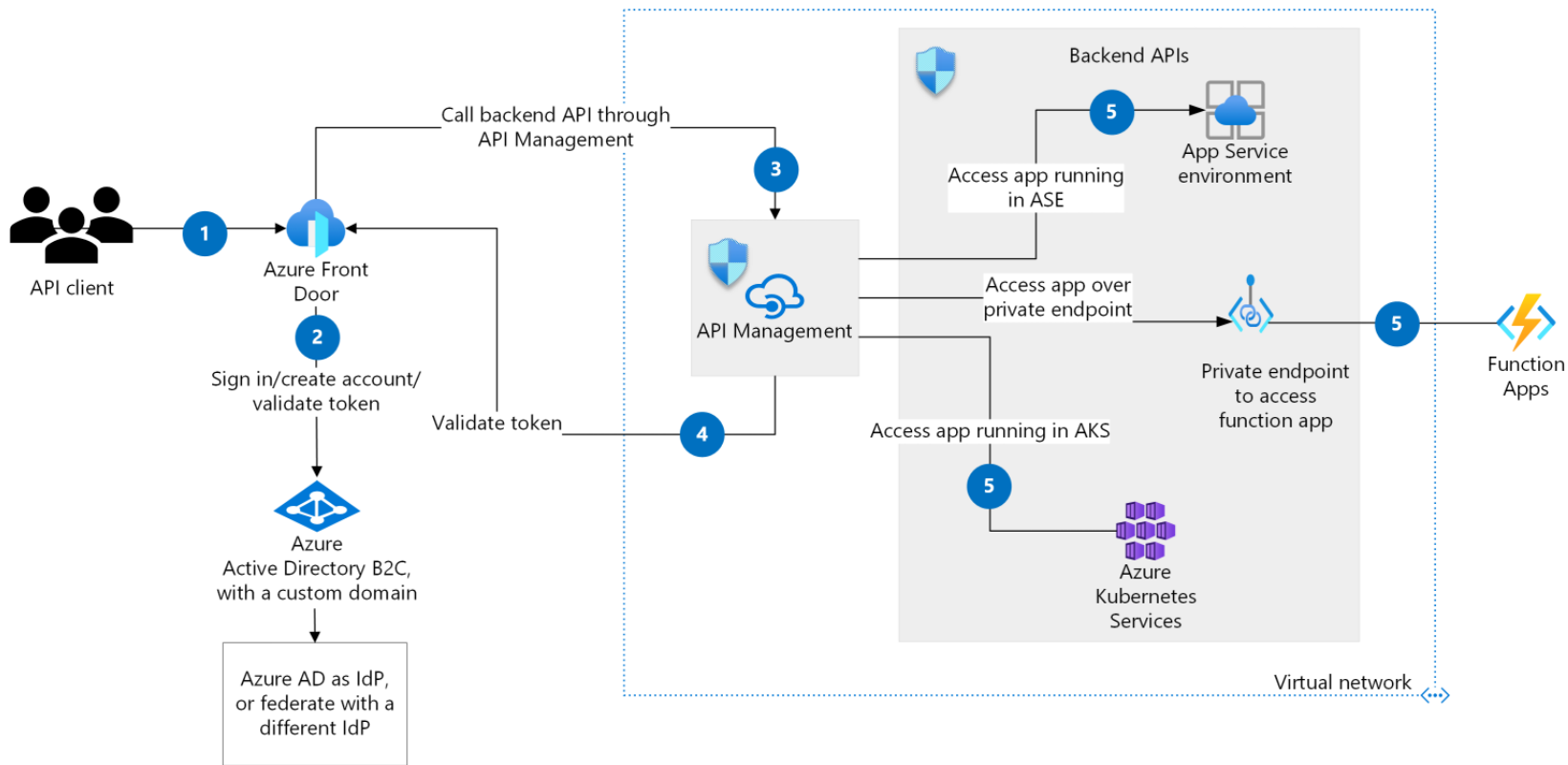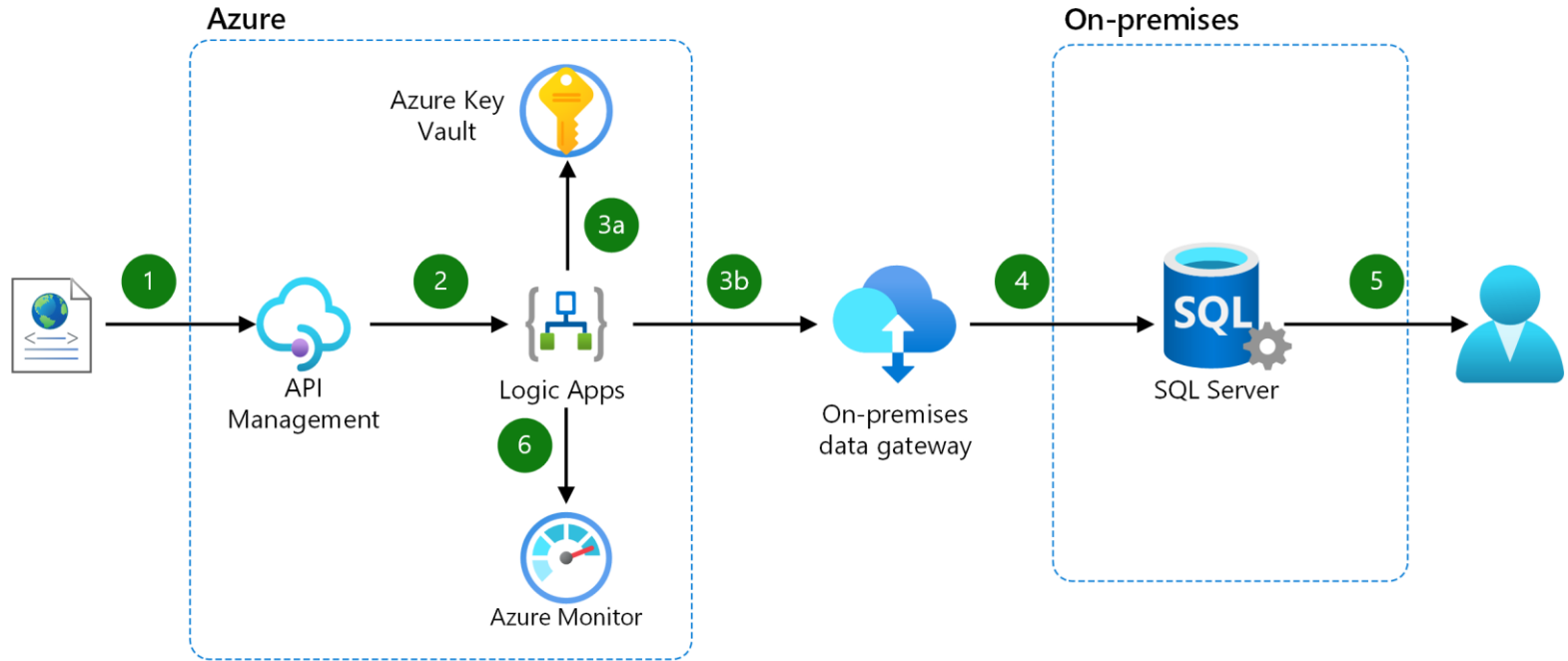- **Develop event-based solutions**

- **Develop message-based solutions**

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]

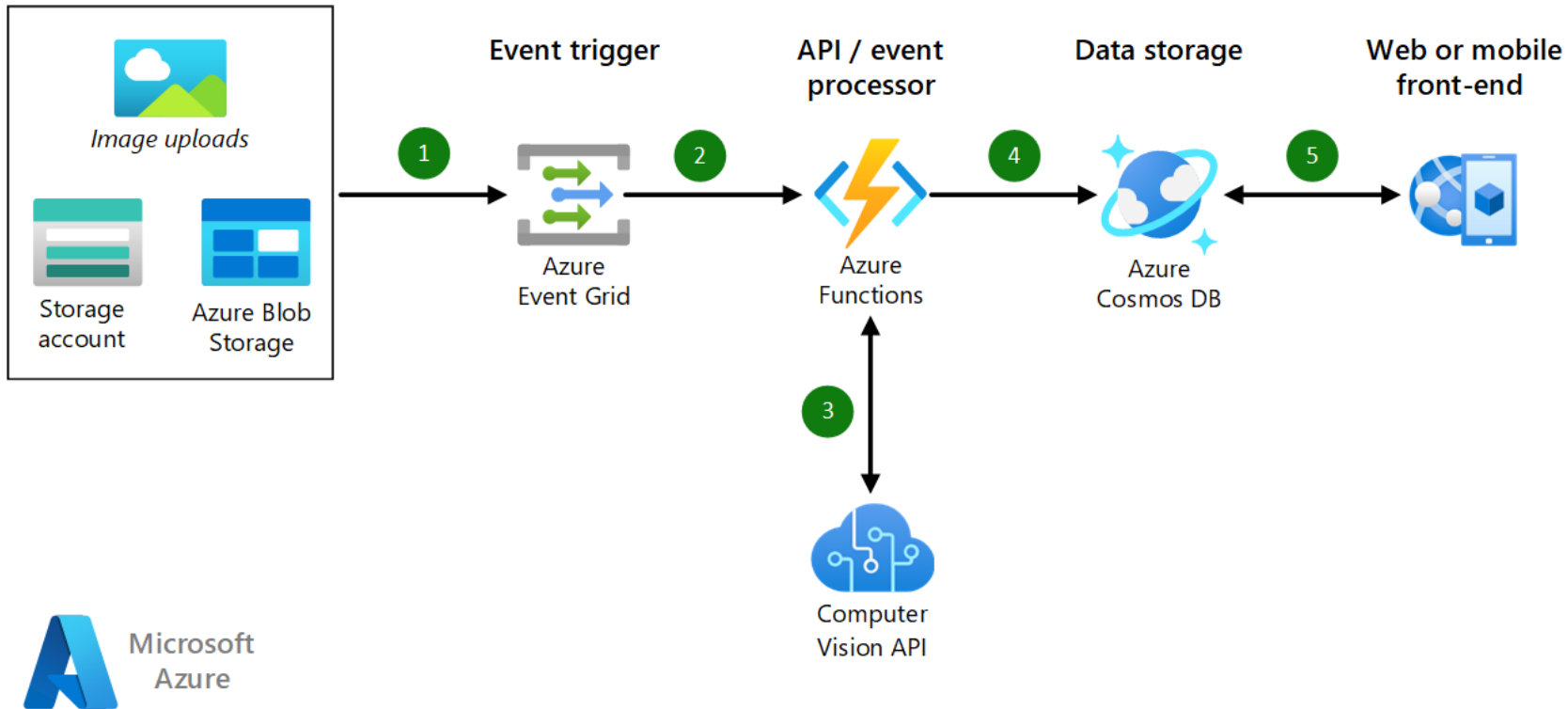# Develop event-based solutions

- 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]

Upload ①

Publish storage event ②

Notify subscribed event ③

Blob Storage

Event Grid

Azure Function

Process ④

All mobile-phone call metadata → Event Hubs → Stream Analytics → Fraudulent call metadata (Blob Storage)

Microsoft Azure

1 2 3 4

Machine Learning

Logic apps

Device

Input Event
Event Hubs

Azure Stream
Analytics

Real-time
dashboard

Raw stream data

Azure Synapse
Analytics

BI reporting

Microsoft
Azure
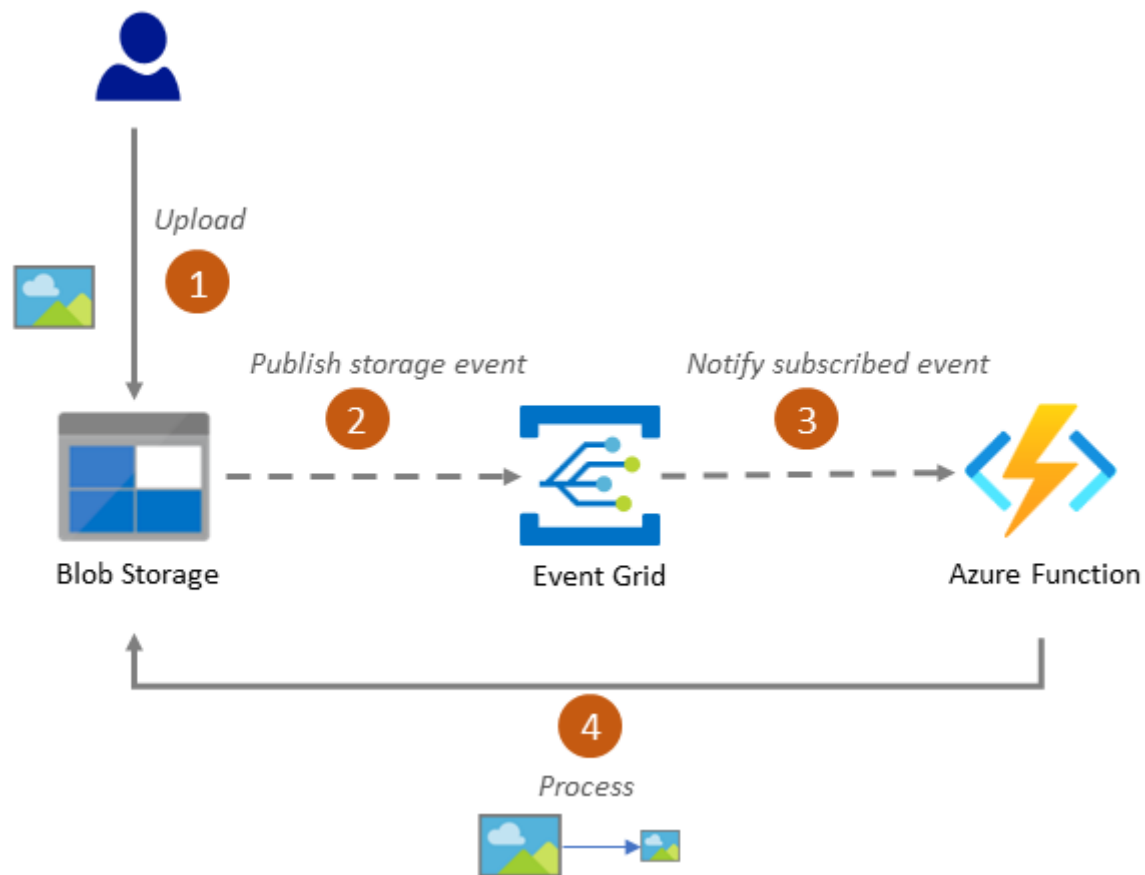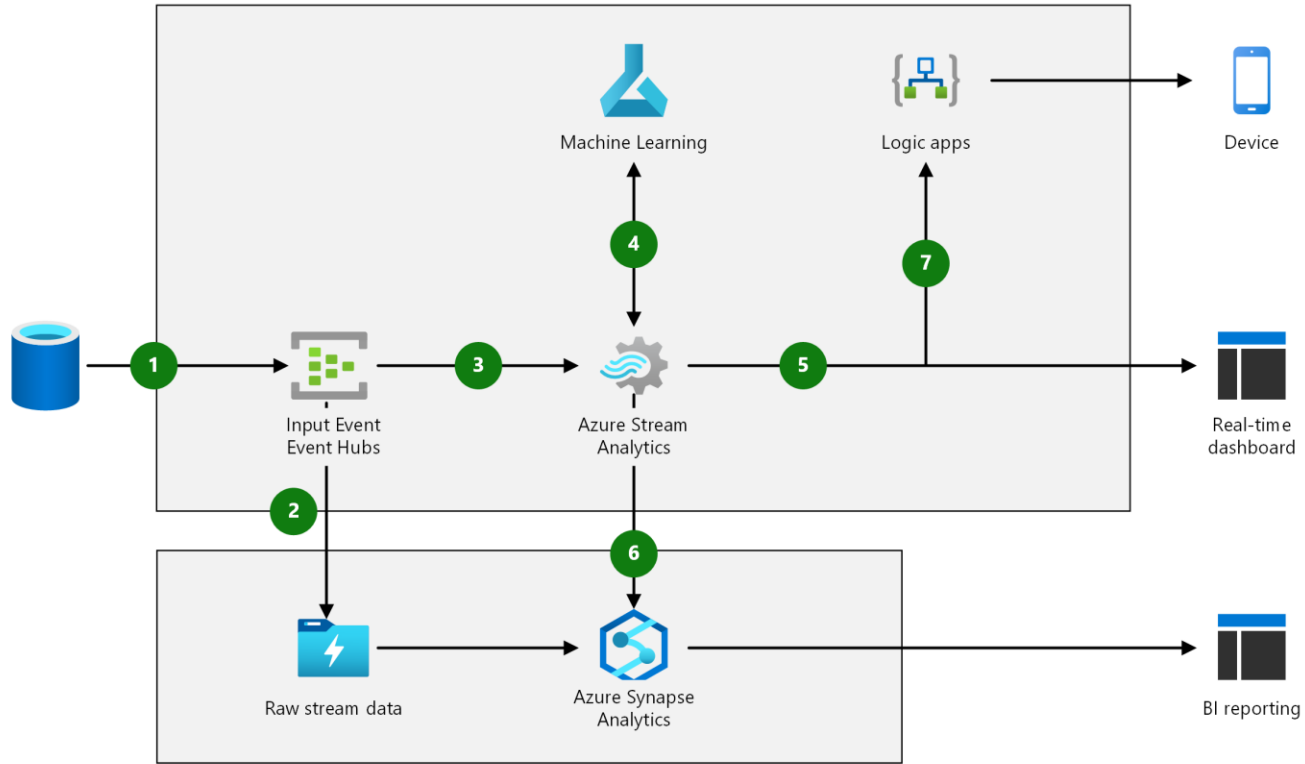
Develop message-based solutions

- Implement solutions that use Azure Service Bus [see 1 2 3 4 5]

- Implement solutions that use Azure Queue Storage queues [see 1 2]

Tasks

Message queue

Service

Requests received
at a variable rate

Messages
processed
at a more
consistent rate

Azure SQL Database → Azure Storage Queue → Web App

Web App ↕ Azure SQL Database

Web App → Azure Blob Storage → Azure Batch → Azure SQL Database → Power BI Dashboard

Azure Batch → Data Science VM
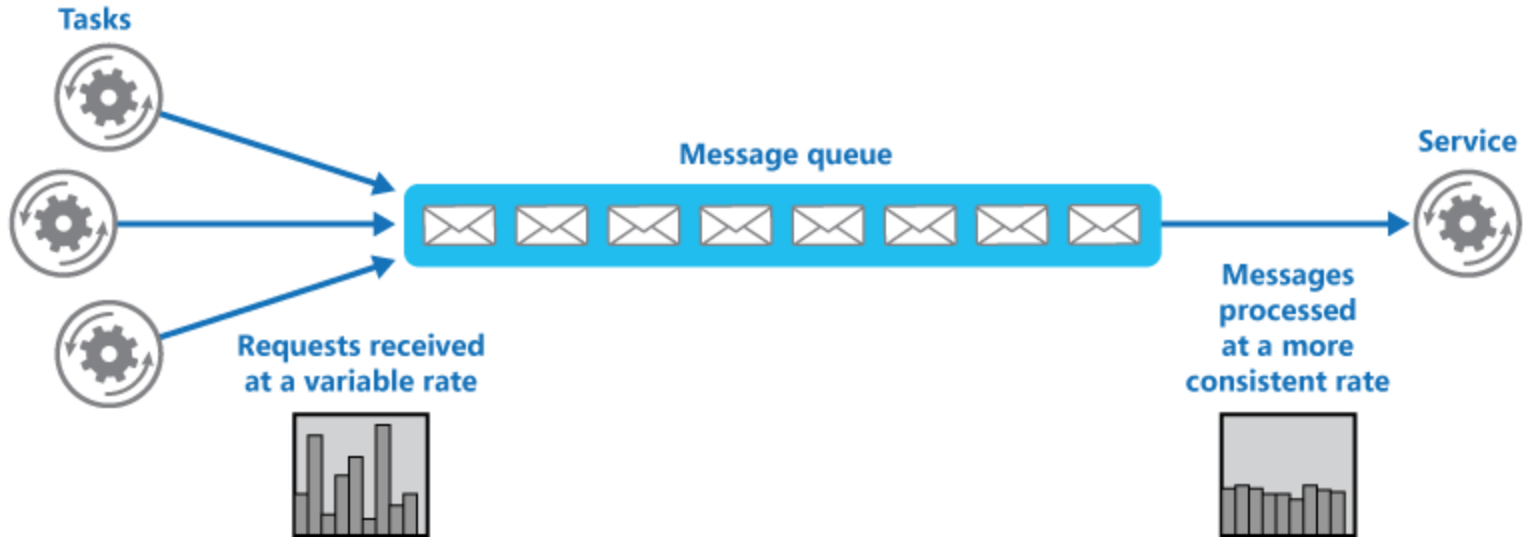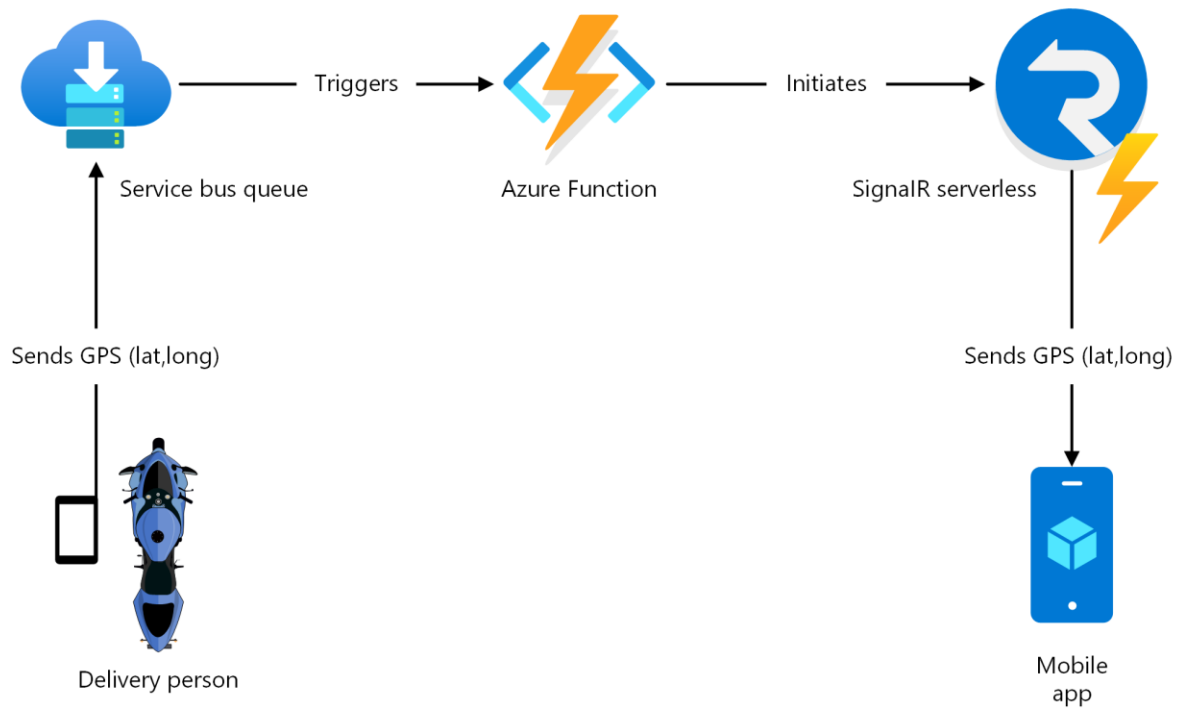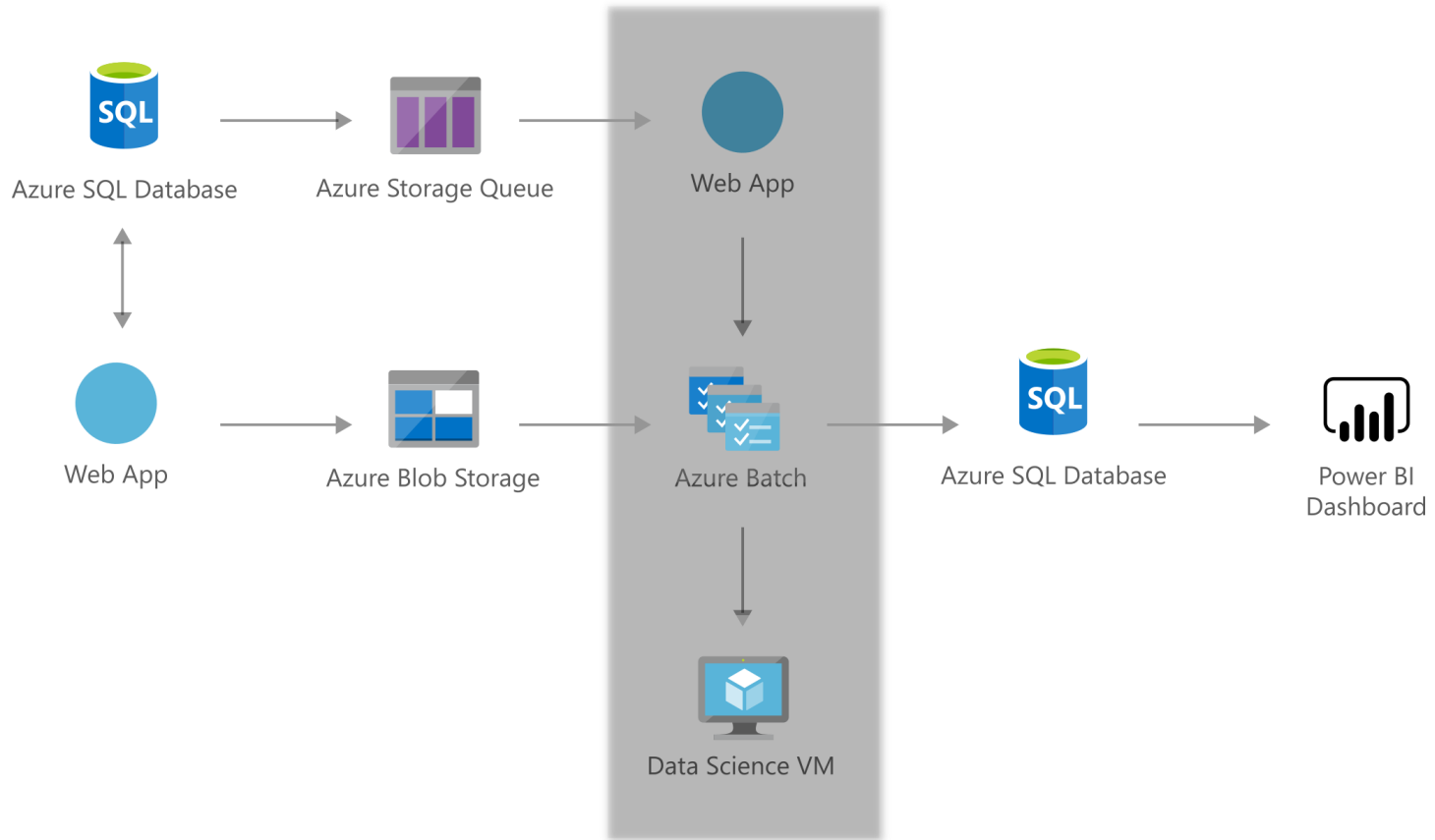
The Exam

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

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.

Schedule exam >

United States

$165 USD*

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

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	OnVUE Online at my home or office	I have a Private Access Code

Where do you want to take your exam?

At a test center	OnVUE 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

Description	Details	Price	Actions
		165.00	Remove

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.

Special offer: Regularly priced at USD 99.00! Click here for details

More Details

USD 80.00

Add to Order

It's time to test your system

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

OnVUE

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.

Course Repository

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

O'REILLY®

Thank you!

Reza Salehi

@zaalion