Microsoft Azure Developer Associate (AZ-204) Crash Course

Developing Solutions for Microsoft Azure

December 2022

Reza Salehi

Cloud Consultant and Trainer

@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

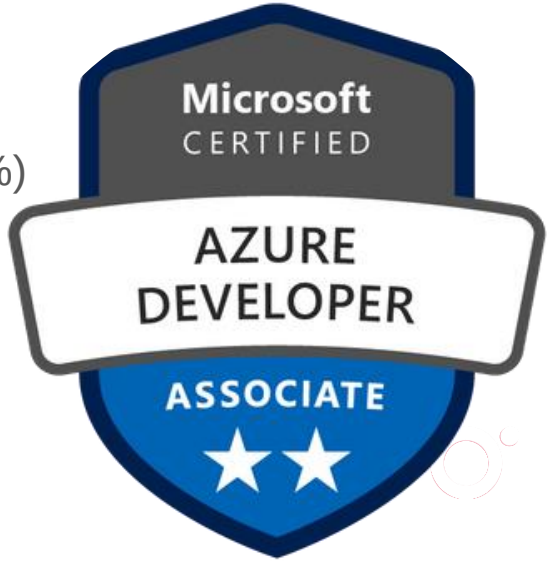
- Should have 1-2 years professional development experience
- Experience with Microsoft Azure
- Can program in a language supported by Azure

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.

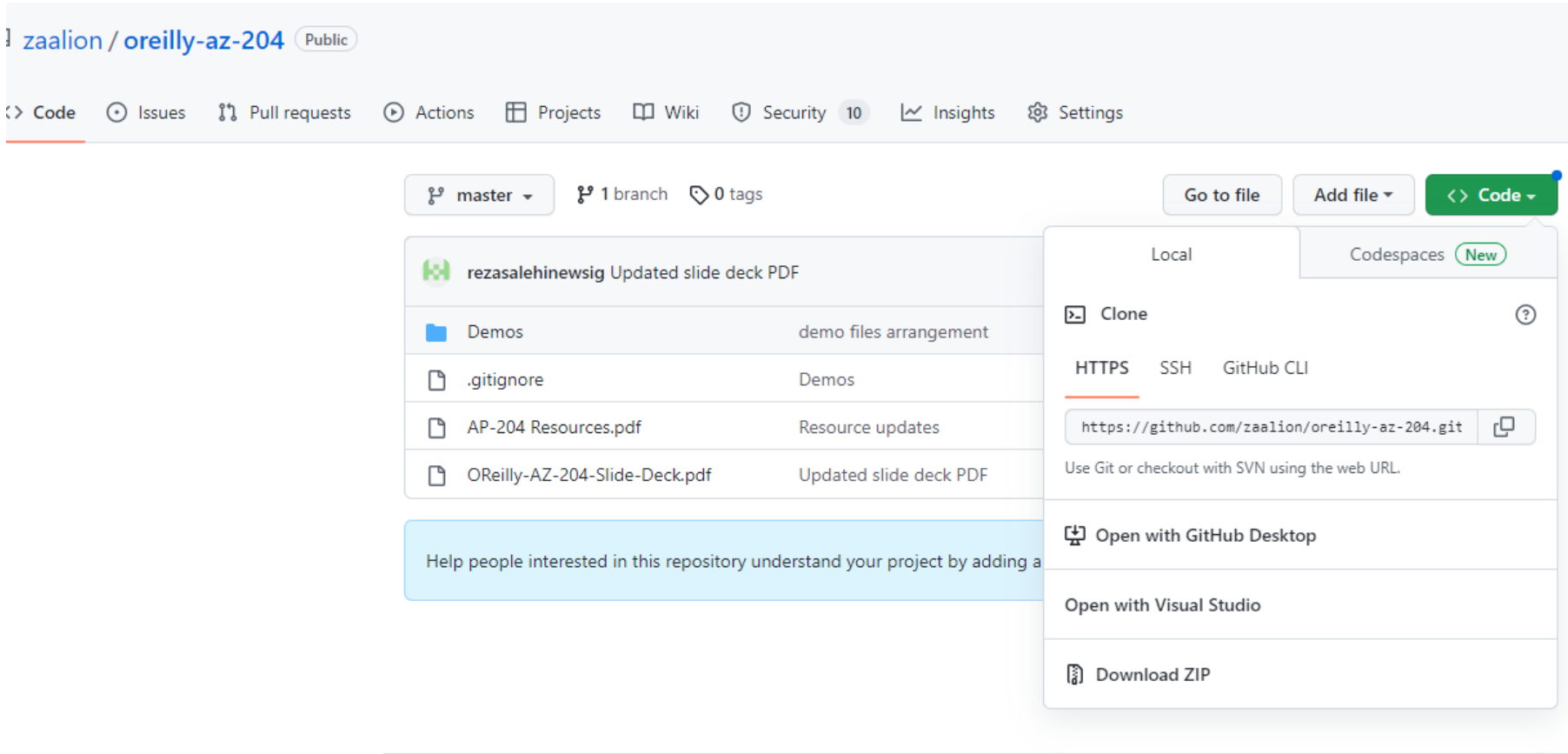
AZ-204 Skills Measured

- 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


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

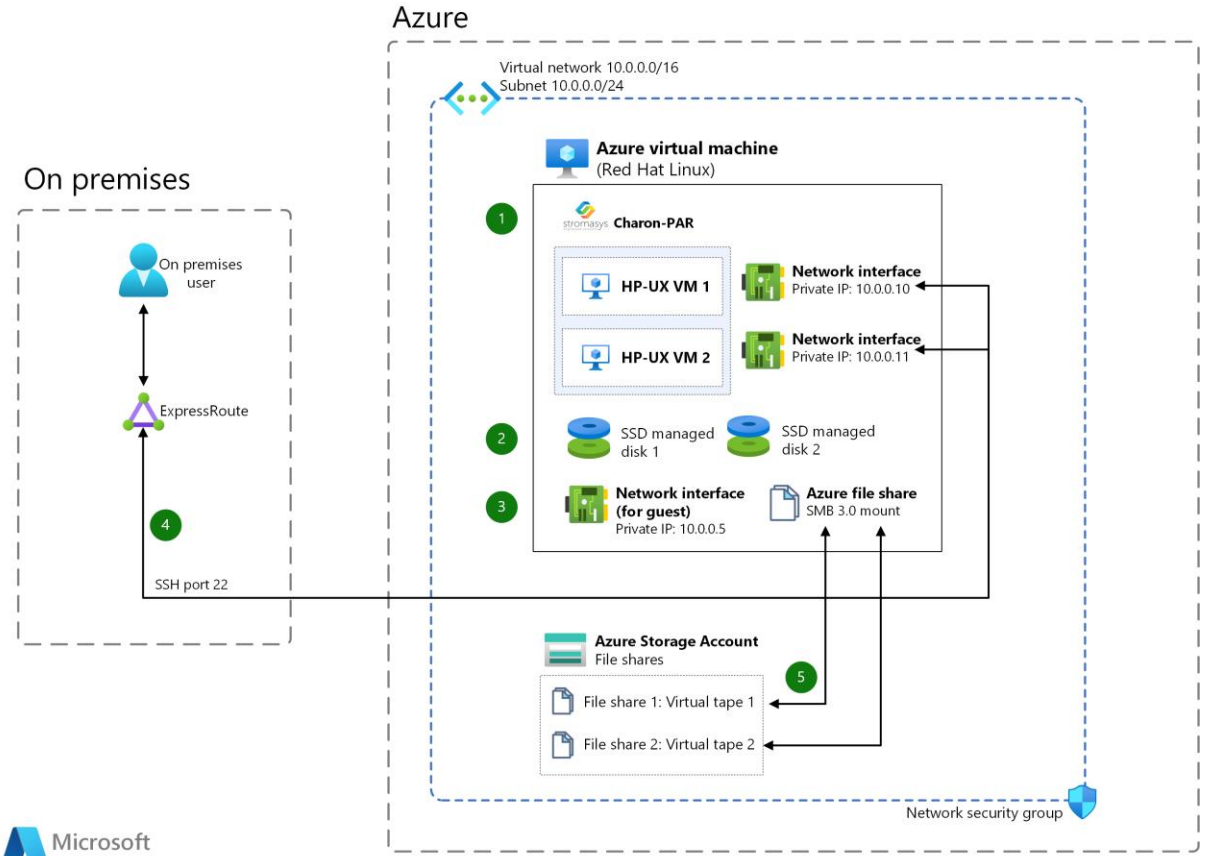
Develop Azure Compute Solutions

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

Implement IaaS solutions

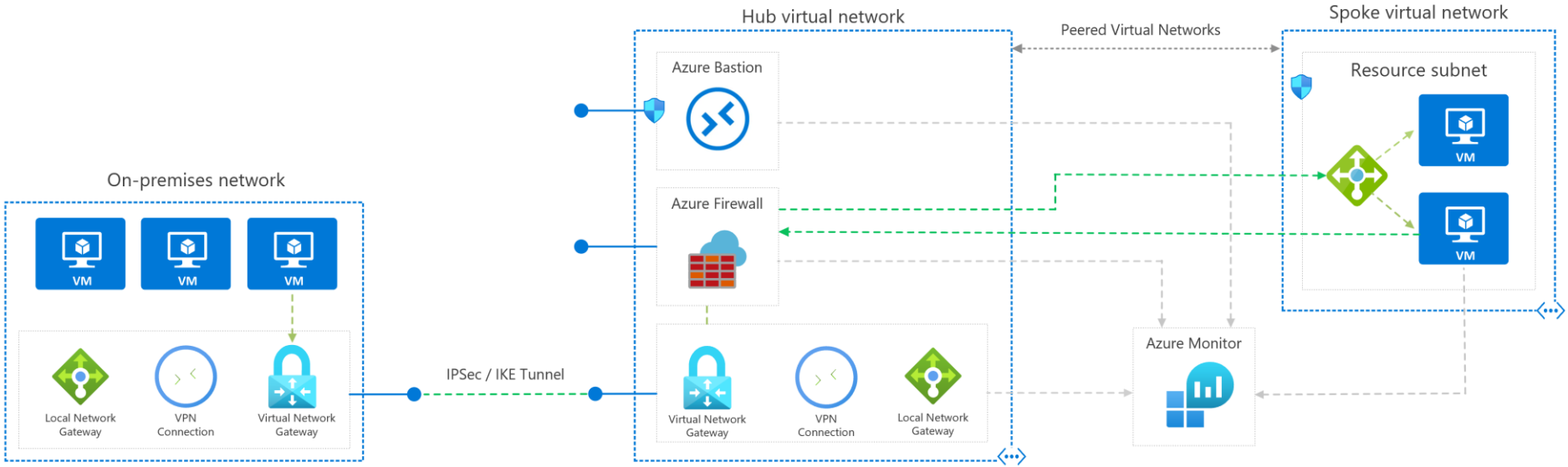
- Provision virtual machines (VMs) [see 1 2 3]
- Configure, validate, and deploy ARM templates [see 1 2 3 4 5 6 7 8]
- Configure container images for solutions [see 1 2]
- Publish an image to the Azure Container Registry [see 1 2 3 4]
- Run containers by using Azure Container Instance [see 1 2 3]

Implement IaaS solutions



Microsoft Azure

Implement IaaS solutions

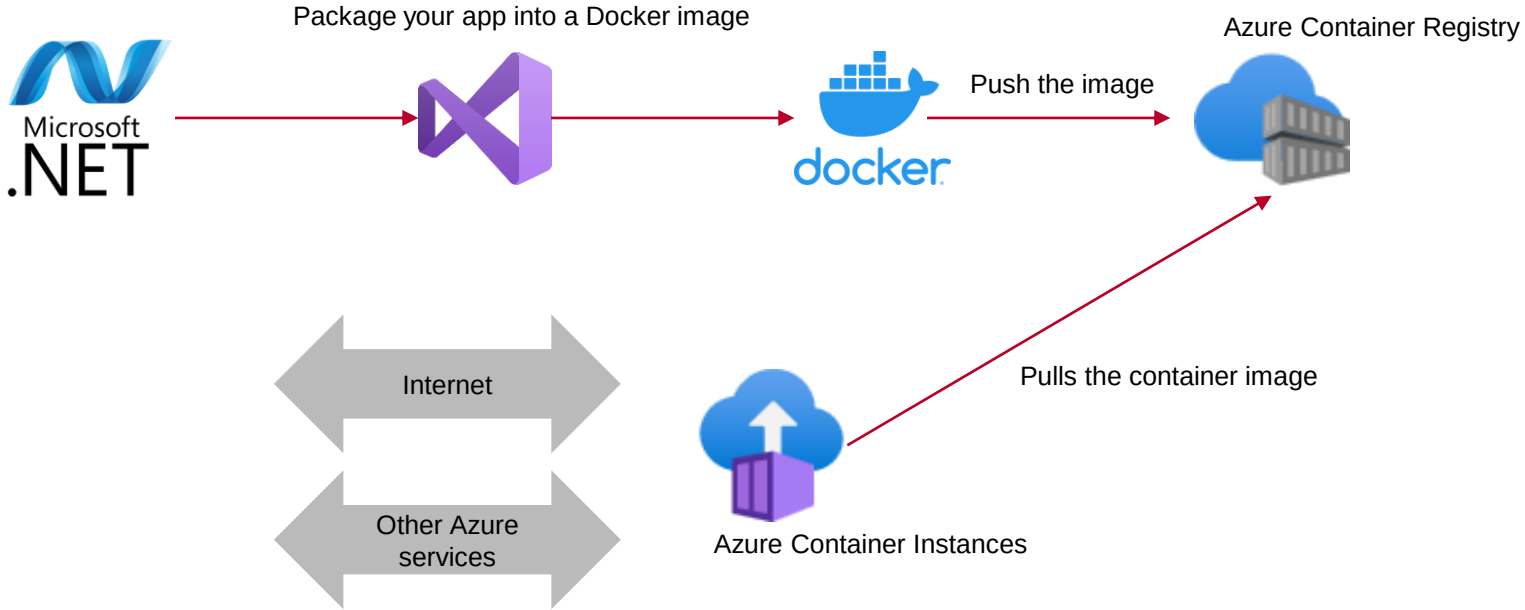


ARM Templates

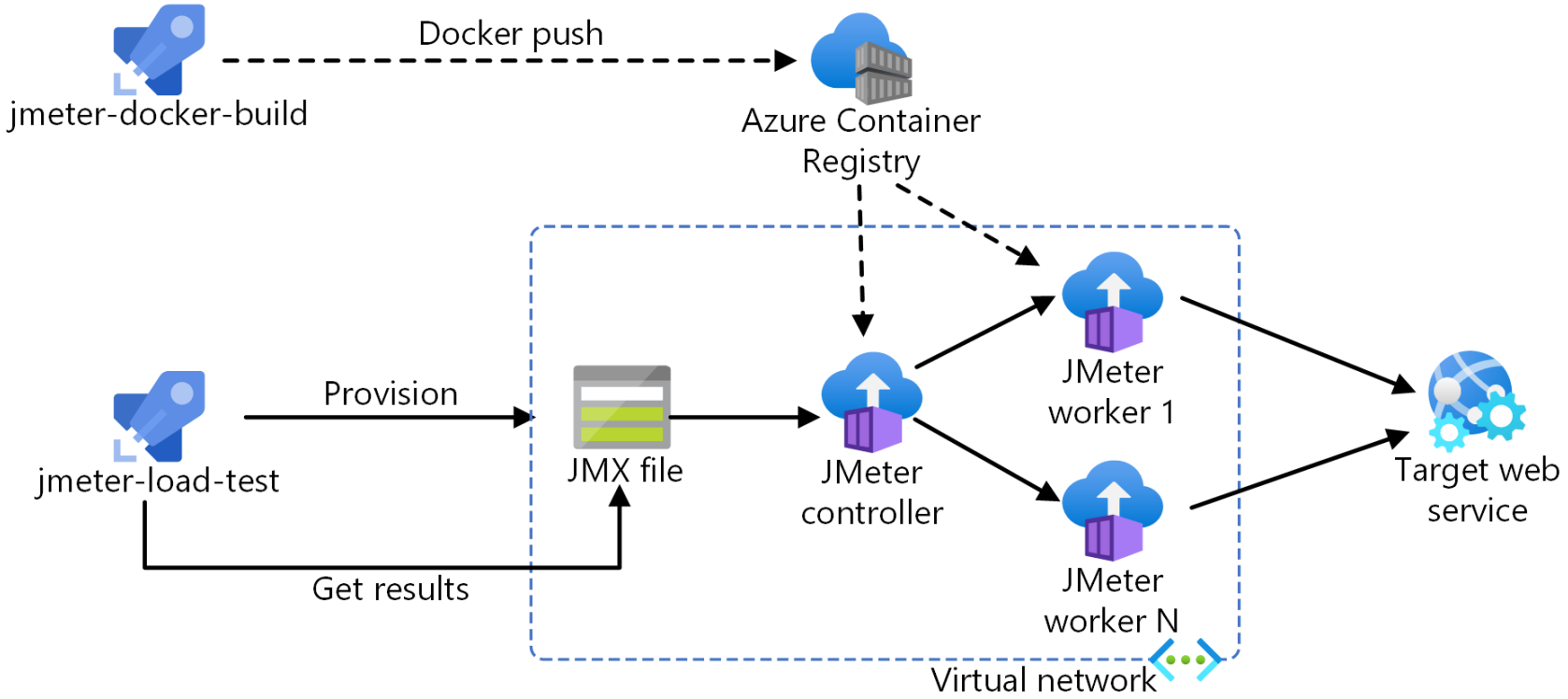
JSON Copy

```
{
  "$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



Microsoft Azure

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

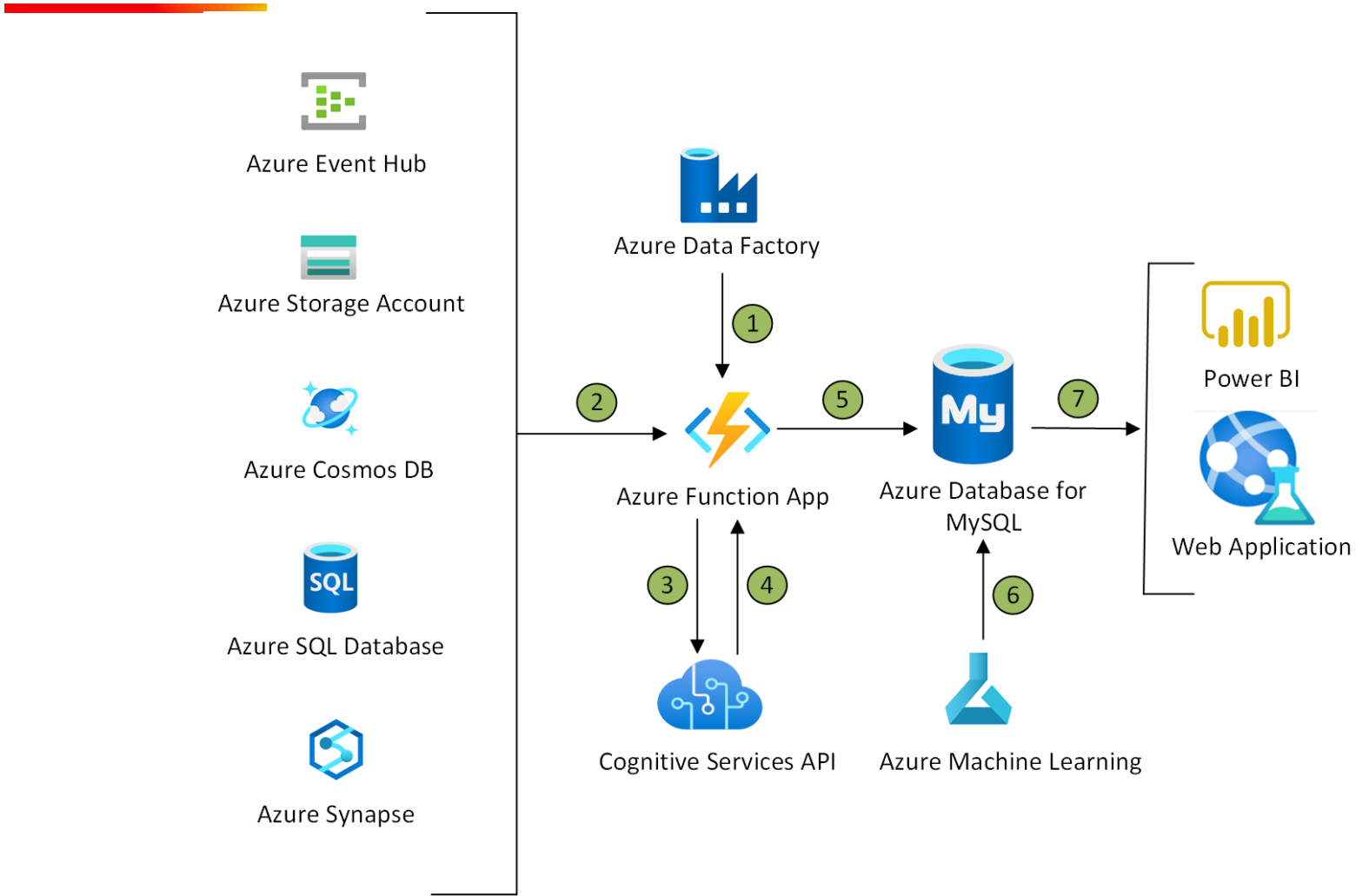
Azure App Service is an HTTP-based service for hosting web applications, REST APIs, and mobile back ends. It can host .NET, .NET Core, Java, Ruby, Node.js, PHP, or Python code

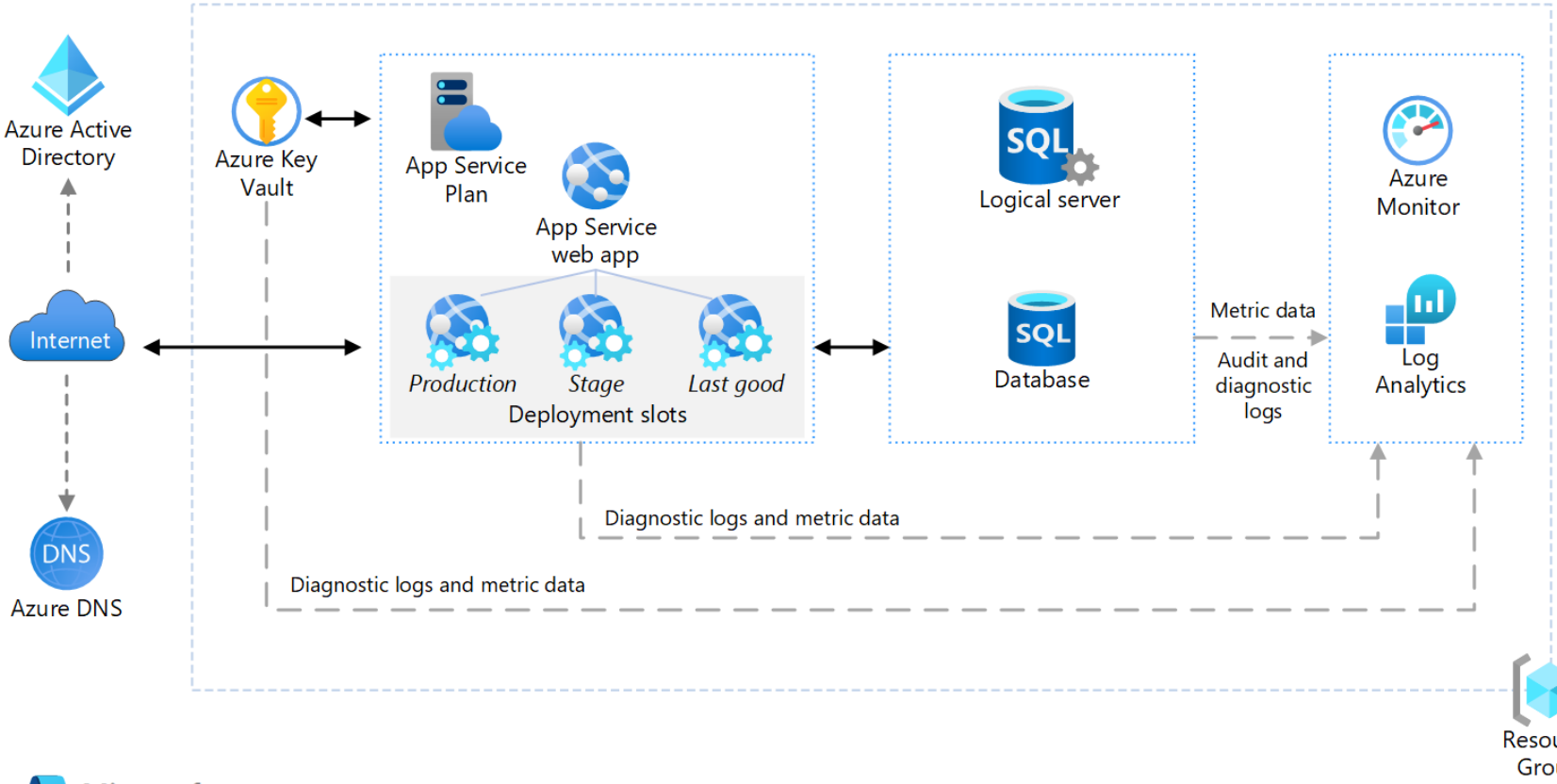
https://docs.microsoft.com/en-us/azure/app-service/overview

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


Azure Event Hub
Azure Storage Account
Azure Cosmos DB
SQL
Azure SQL Database
Azure Synapse
Azure Data Factory
1
2
Azure Function App
3
4
Cognitive Services API
5
My
Azure Database for MySQL
6
Azure Machine Learning
7
Power BI
Web Application



Microsoft Azure

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)

https://docs.microsoft.com/en-us/azure/azure-functions/functions-overview

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

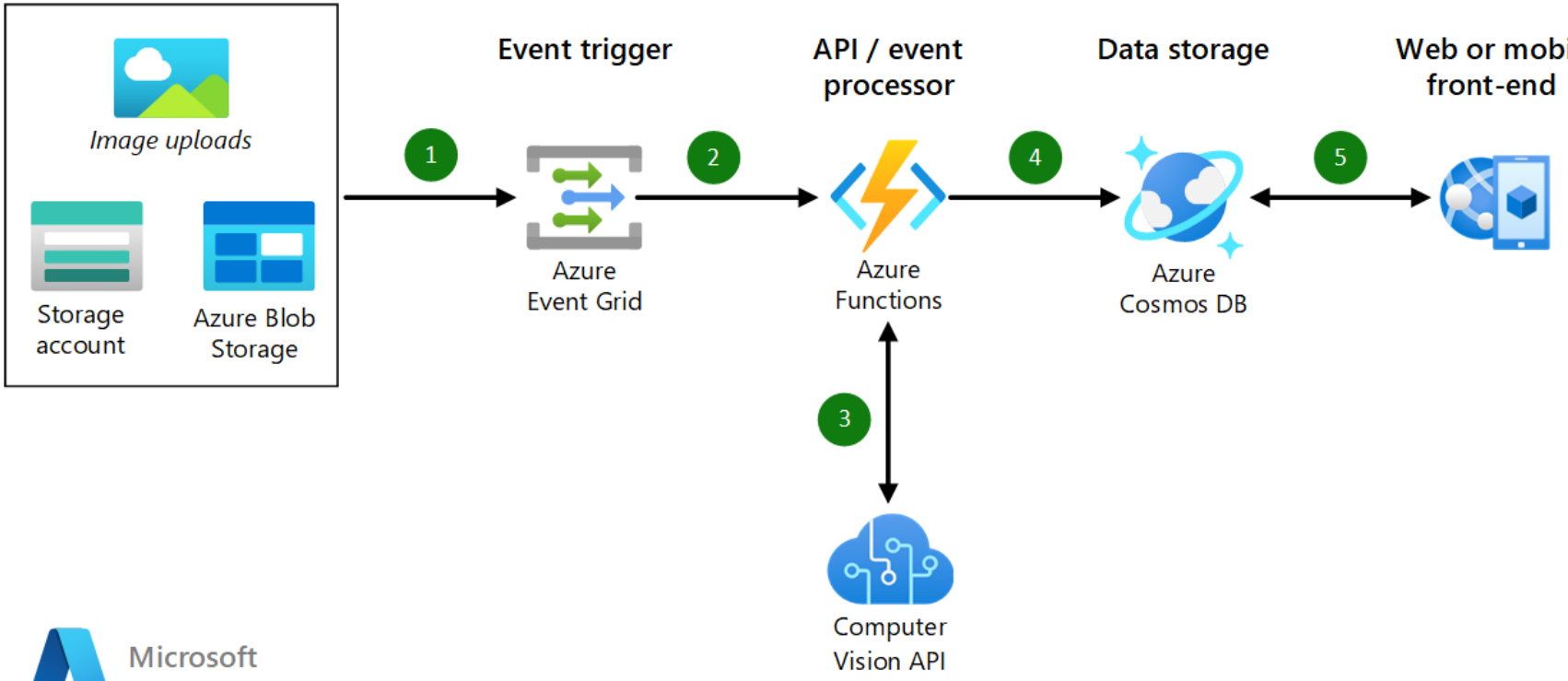
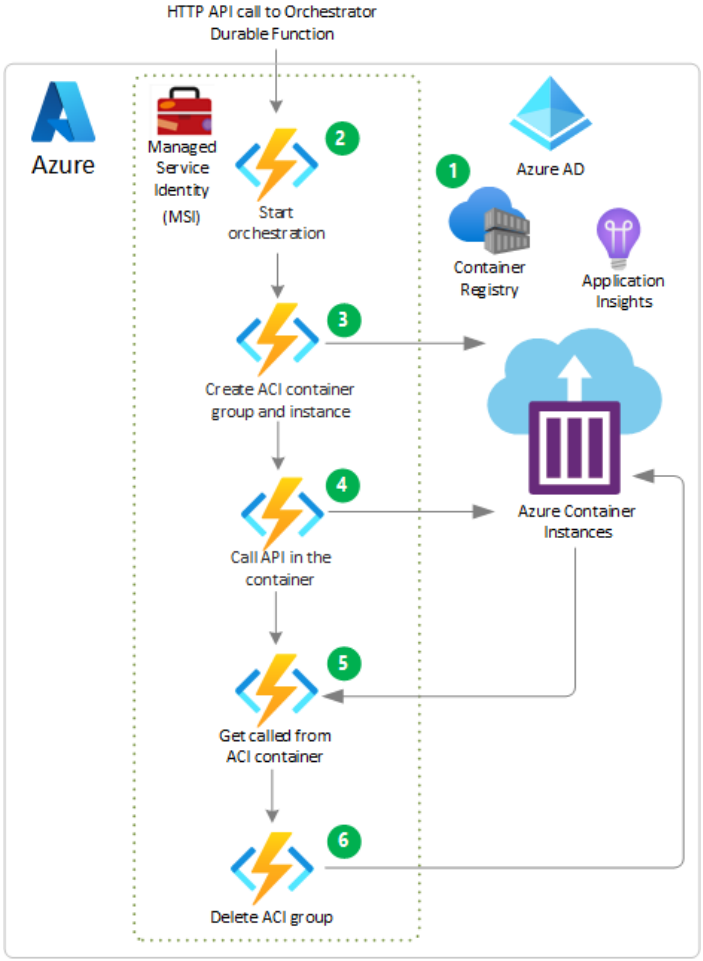


Image uploads
Storage account
Azure Blob Storage
Event trigger
API / event processor
Data storage
Web or mobile front-end
1
2
3
4
5
Azure Event Grid
Azure Functions
Azure Cosmos DB
Computer Vision API
Microsoft Azure


HTTP API call to Orchestrator Durable Function
Azure
Managed Service Identity (MSI)
2
Start orchestration
1
Azure AD
Container Registry
Application Insights
3
Create ACI container group and instance
4
Call API in the container
Azure Container Instances
5
Get called from ACI container
6
Delete ACI group

Develop for Azure Storage

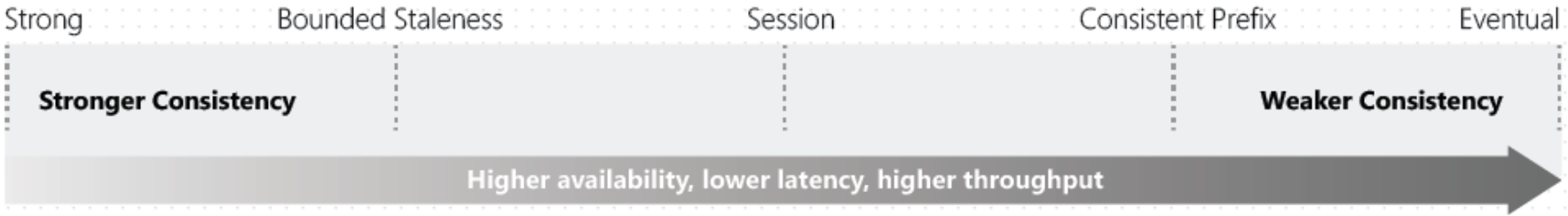
Design Azure Data Storage Solutions

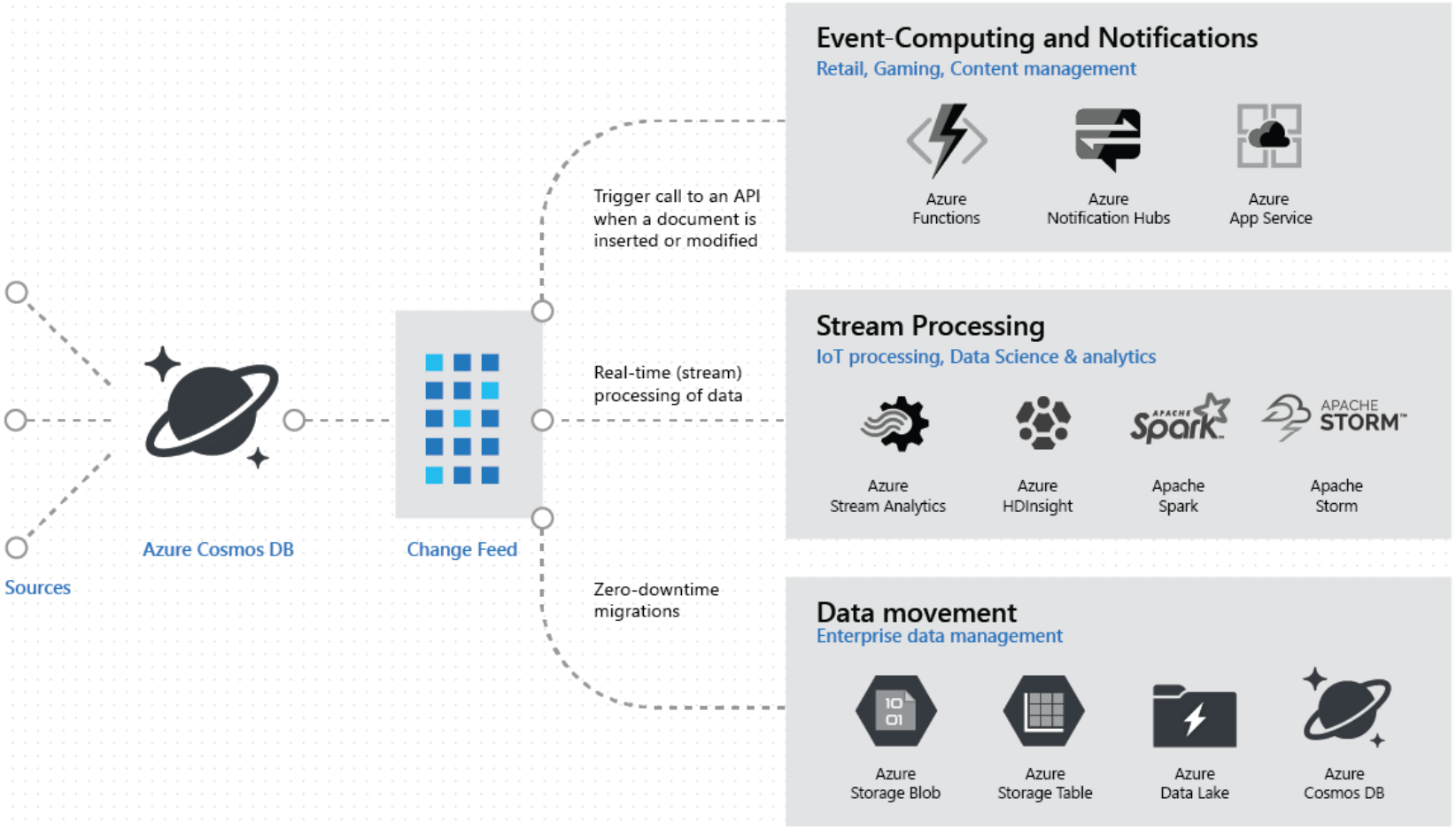
- Develop solutions that use Cosmos DB storage
- Develop solutions that use blob storage

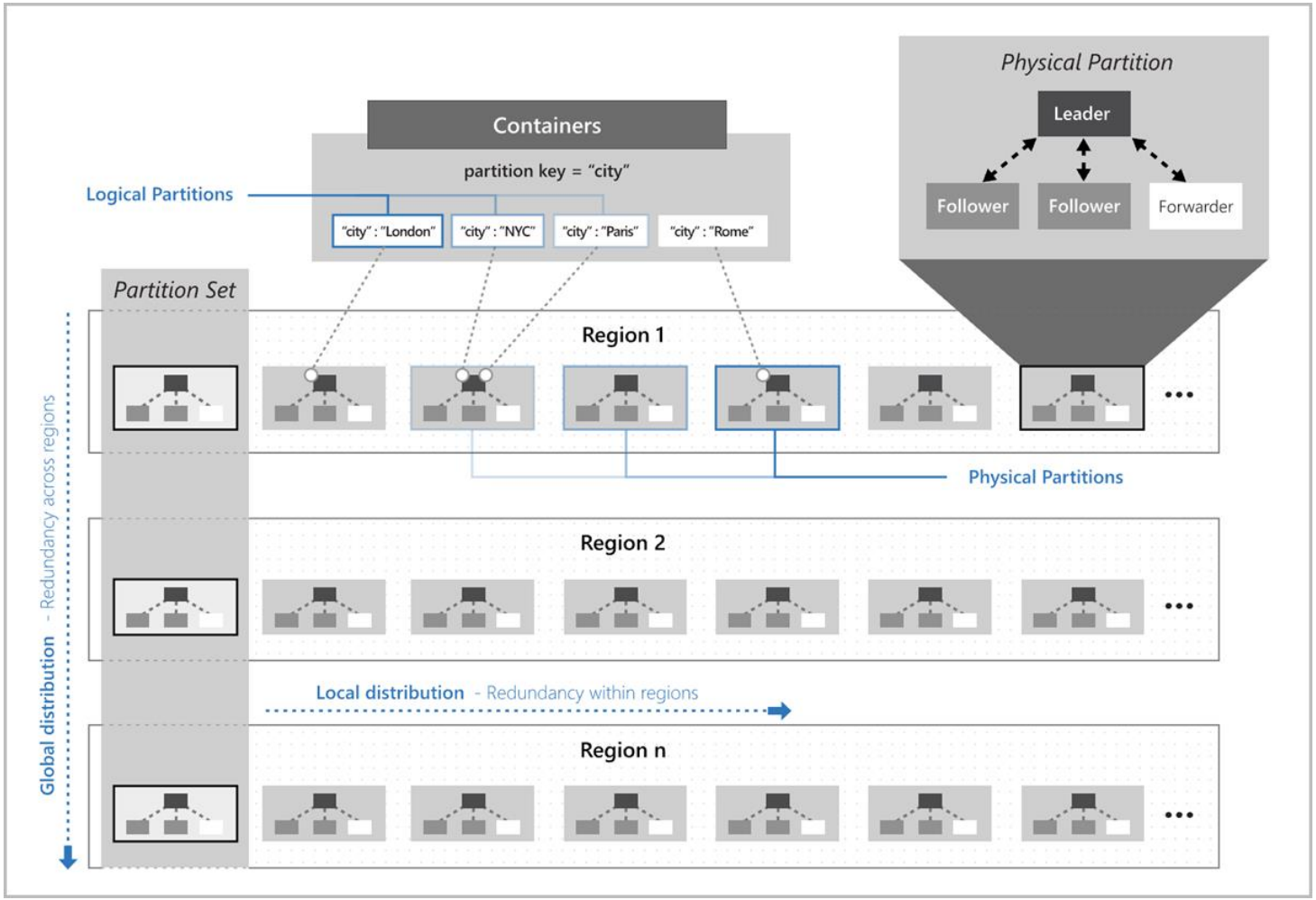
Develop solutions that use Cosmos DB storage

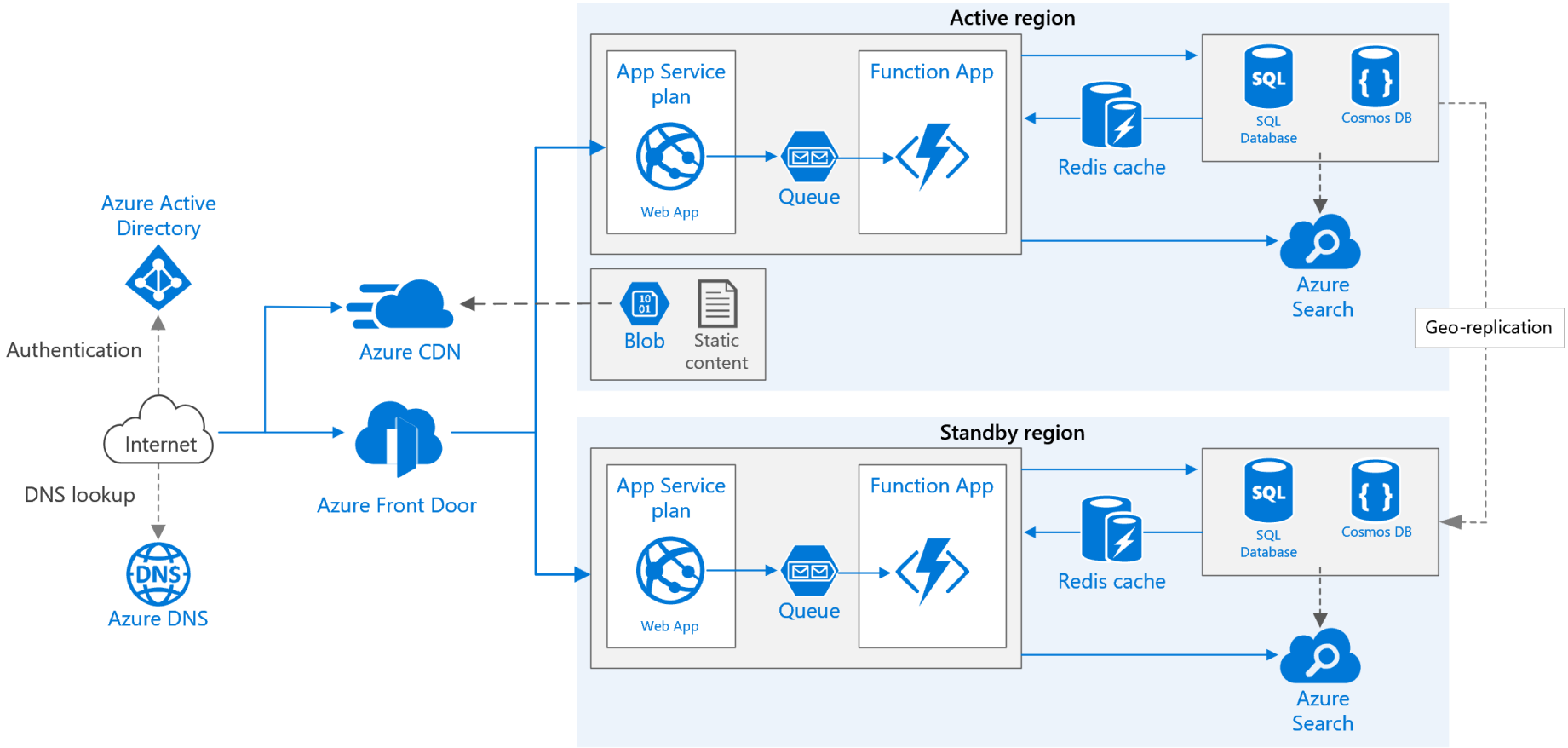
- Select the appropriate API and SDK for a solution [see 1 2 3 4 5 6 7 8 9]
- Implement partitioning schemes and partition keys [see 1 2]
- Perform operations on data and Cosmos DB containers [see 1 2]
- Set the appropriate consistency level for operations [see 1]
- Manage change feed notifications [see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

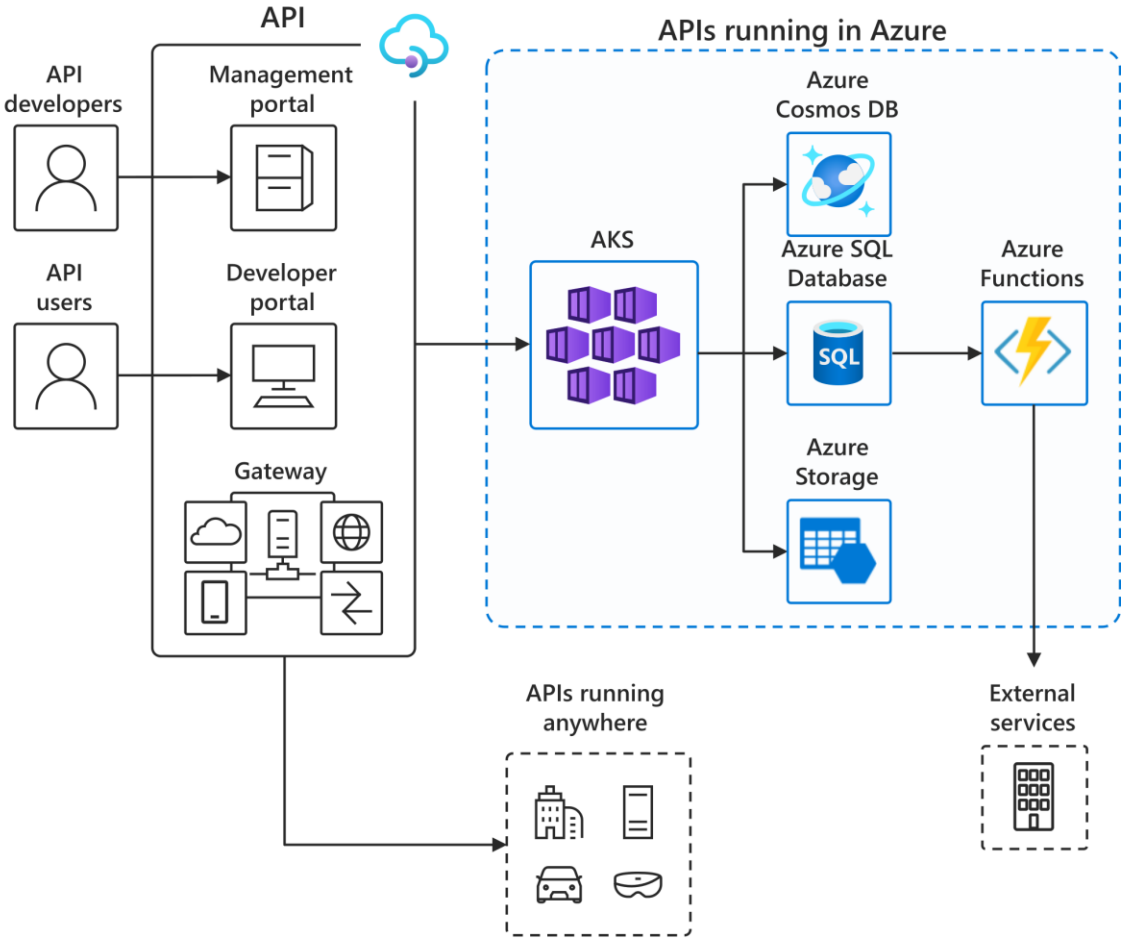
Consistency Levels in Azure Cosmos DB




Event-Computing and Notifications
Retail, Gaming, Content management
Azure Functions
Azure Notification Hubs
Azure App Service
Trigger call to an API when a document is inserted or modified
Stream Processing
IoT processing, Data Science & analytics
Azure Stream Analytics
Azure HDInsight
Apache Spark
Apache Storm
Real-time (stream) processing of data
Sources
Azure Cosmos DB
Change Feed
Zero-downtime migrations
Data movement
Enterprise data management
Azure Storage Blob
Azure Storage Table
Azure Data Lake
Azure Cosmos DB


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


Active region
App Service plan
Web App
Function App
Queue
Redis cache
SQL
SQL Database
Cosmos DB
Azure Search
Blob
Static content
Azure Active Directory
Authentication
Azure CDN
Internet
DNS lookup
Azure Front Door
DNS
Azure DNS
Geo-replication
Standby region
App Service plan
Web App
Function App
Queue
Redis cache
SQL
SQL Database
Cosmos DB
Azure Search

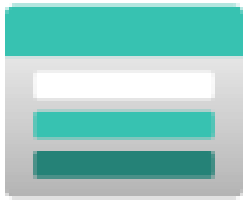

API
API developers
Management portal
API users
Developer portal
Gateway
APIs running in Azure
Azure Cosmos DB
AKS
Azure SQL Database
Azure Functions
Azure Storage
SQL
APIs running anywhere
External services

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]

Azure Storage Account

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



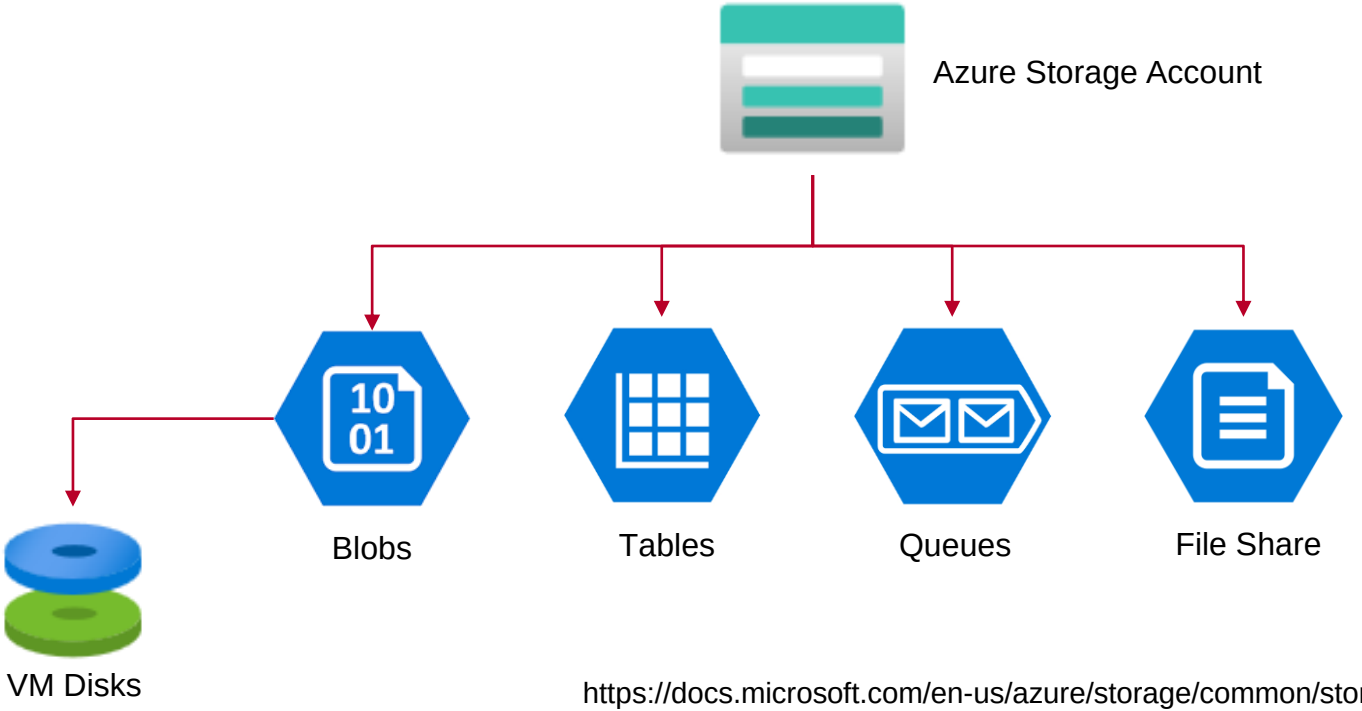
https://docs.microsoft.com/en-us/azure/storage/common/storage-account-overview

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

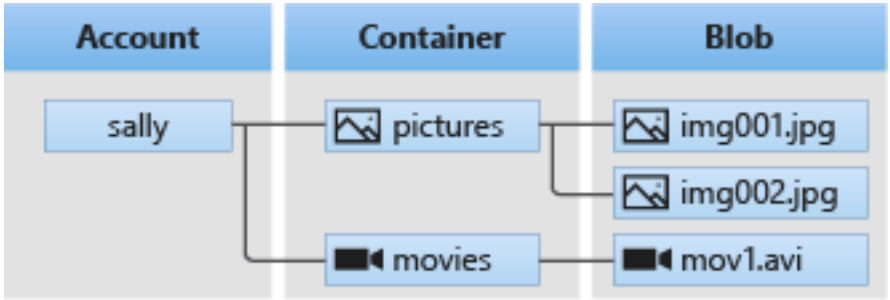
Azure Storage Services



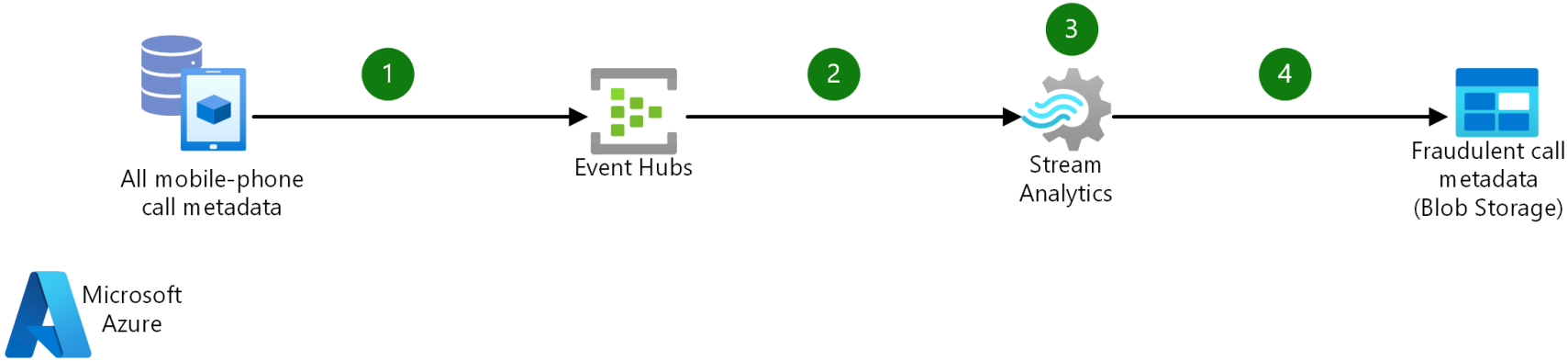
https://docs.microsoft.com/en-us/azure/storage/common/storage-introduction

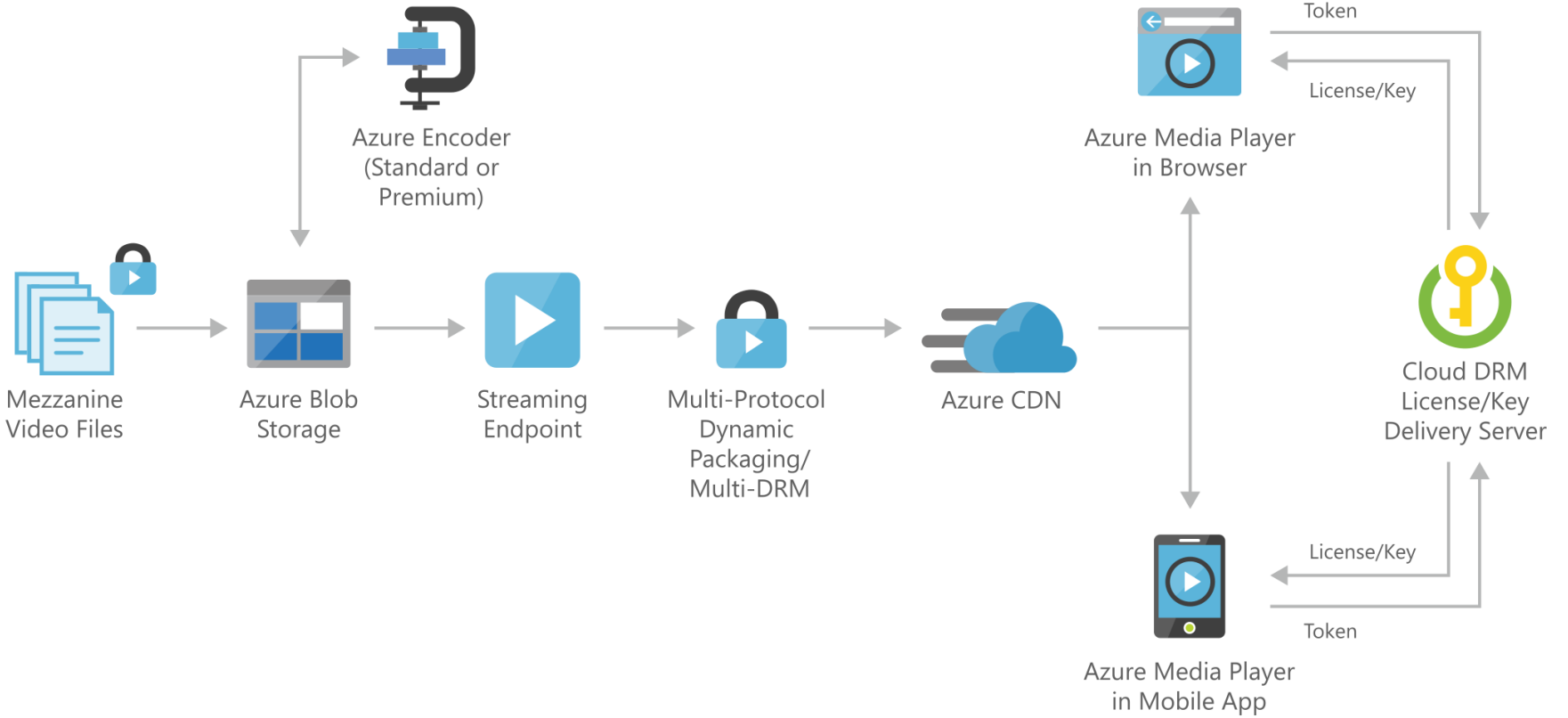
Azure Storage Account: Blobs

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



https://docs.microsoft.com/en-us/azure/storage/blobs/storage-blobs-introduction


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


Azure Encoder
(Standard or
Premium)
Mezzanine
Video Files
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
License/Key
Token
Azure Media Player
in Mobile App

Implement Azure Security

Implement Azure Security

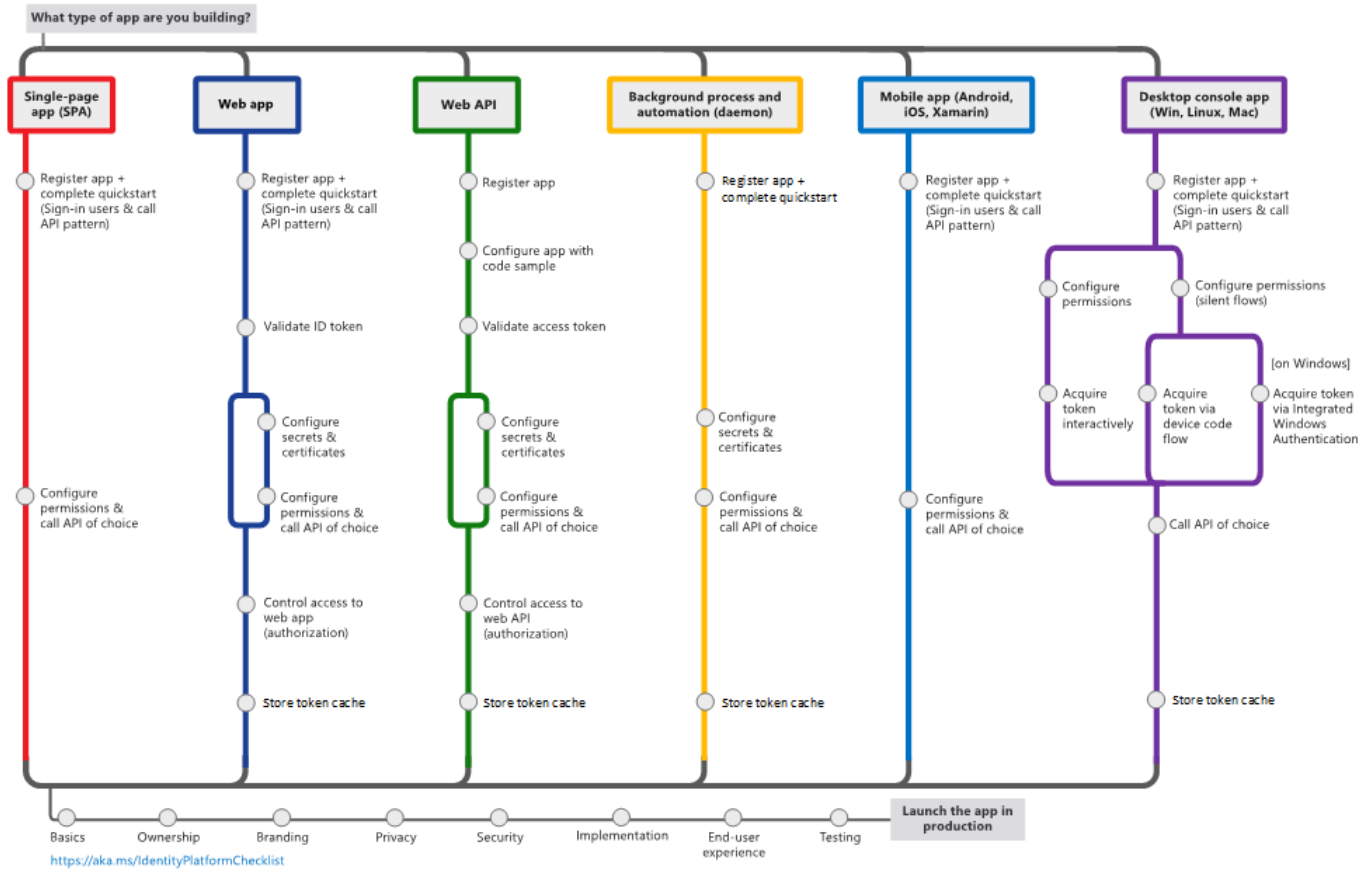
- Implement user authentication and authorization
- Implement secure cloud solutions

Implement user authentication and authorization

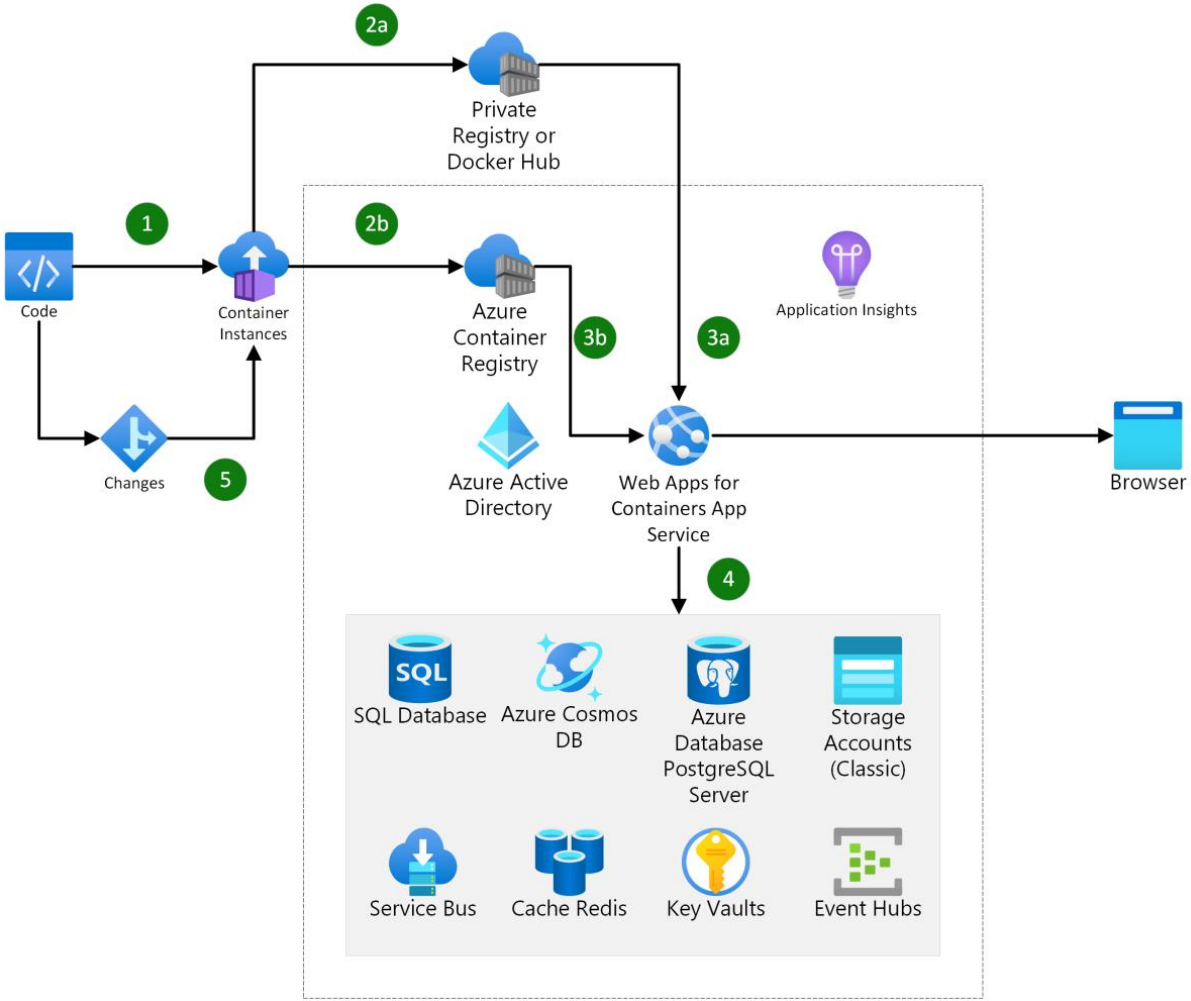
- Authenticate and authorize users by using the Microsoft Identity platform [see 1 2 3 4]
- Authenticate and authorize users and apps by using Azure Active Directory [see 1 2]
- Create and implement shared access signatures [see 1 2]
- Implement solutions with Microsoft Graph [see 1 2 3 4 5]

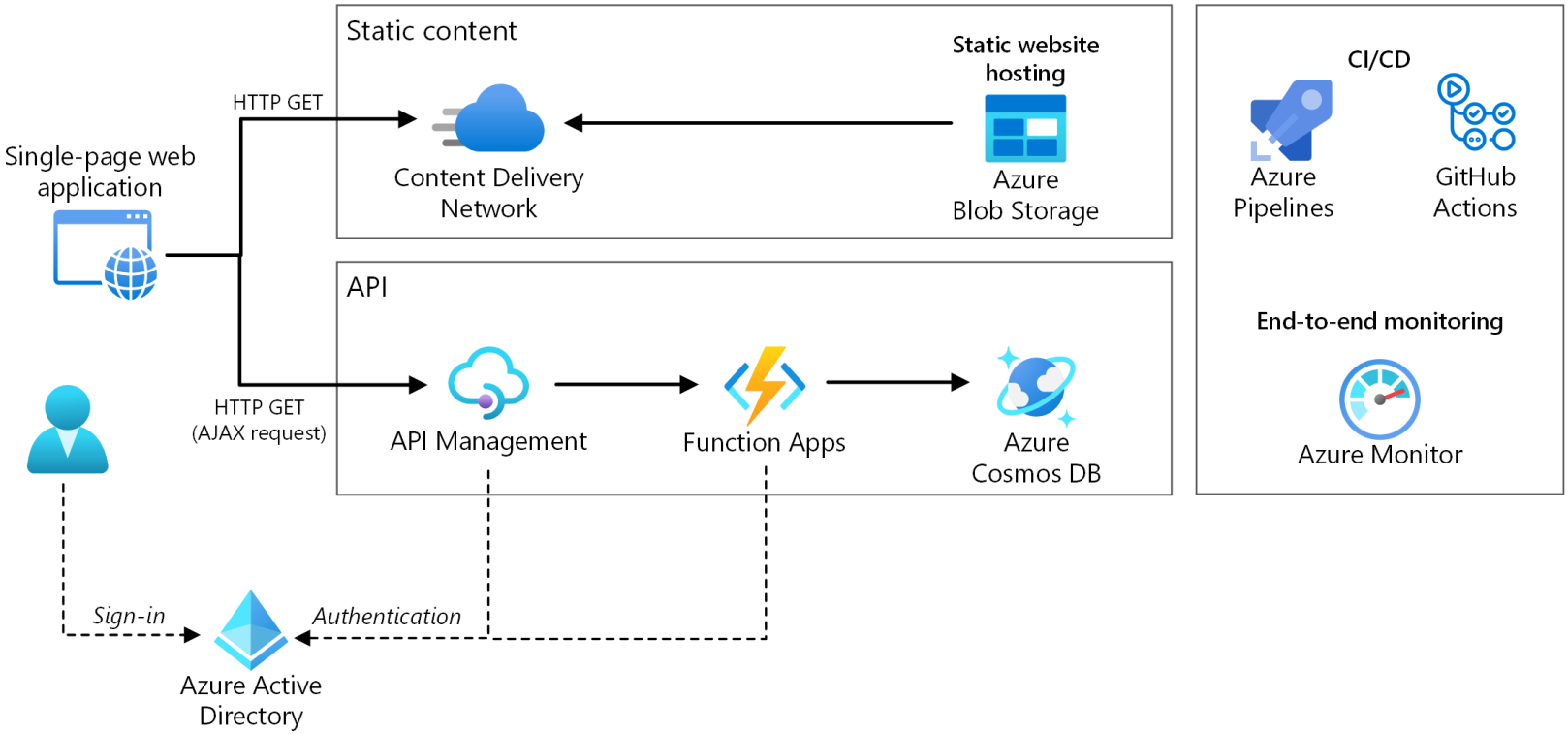
Microsoft identity platform

http://aka.ms/IdentityPlatform



Microsoft

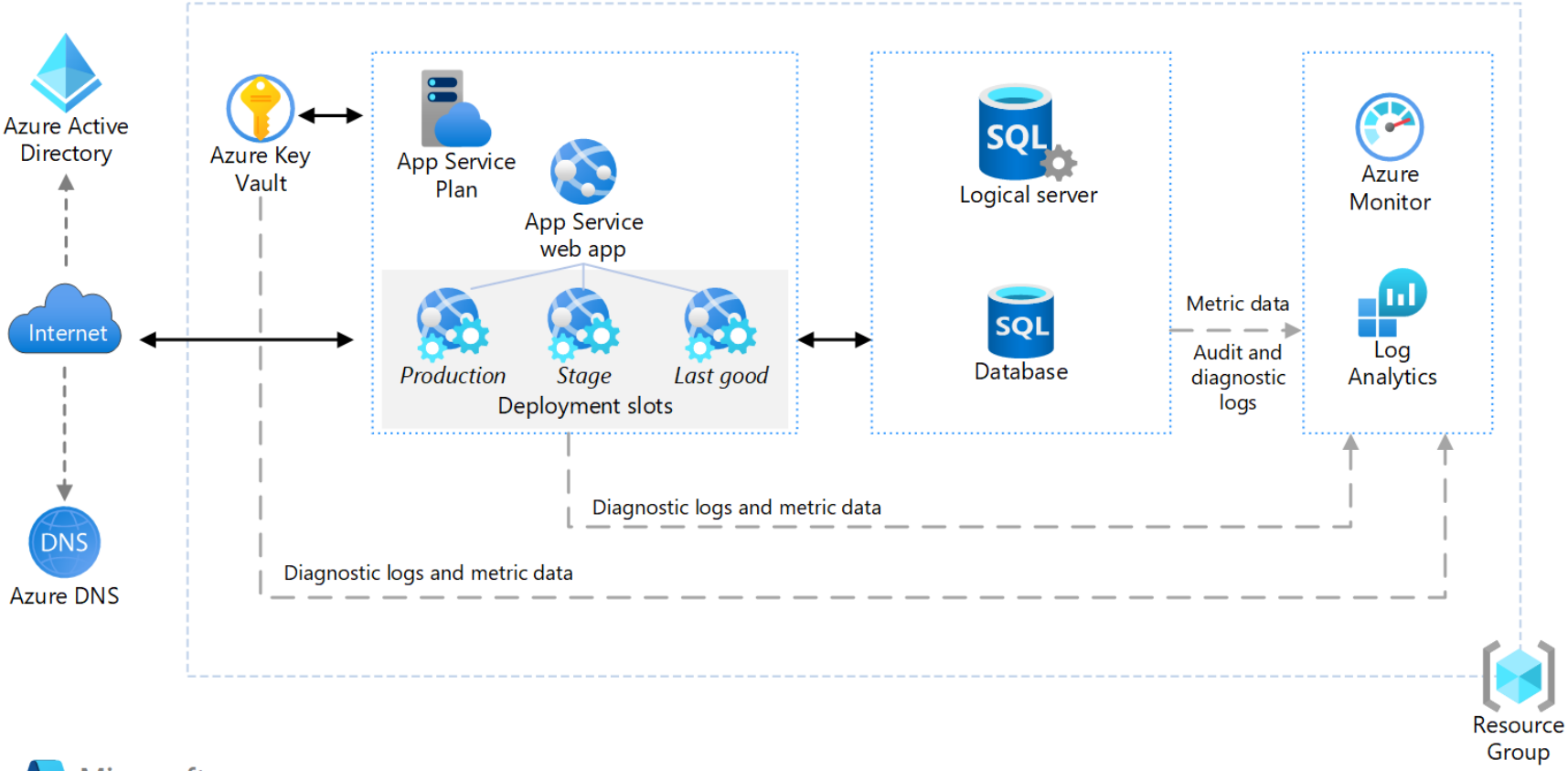

2a
Private Registry or Docker Hub
1
2b
Code
Container Instances
Azure Container Registry
3b
3a
Application Insights
Changes
5
Azure Active Directory
Web Apps for Containers App Service
Browser
4
SQL Database
Azure Cosmos DB
Azure Database PostgreSQL Server
Storage Accounts (Classic)
Service Bus
Cache Redis
Key Vaults
Event Hubs



Microsoft Azure

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]


Azure Active Directory
Azure Key Vault
App Service Plan
App Service web app
Logical server
Azure Monitor
Internet
Production
Stage
Last good
Deployment slots
Database
Metric data
Audit and diagnostic logs
Log Analytics
DNS
Azure DNS
Diagnostic logs and metric data
Diagnostic logs and metric data
Resource Group
Microsoft Azure

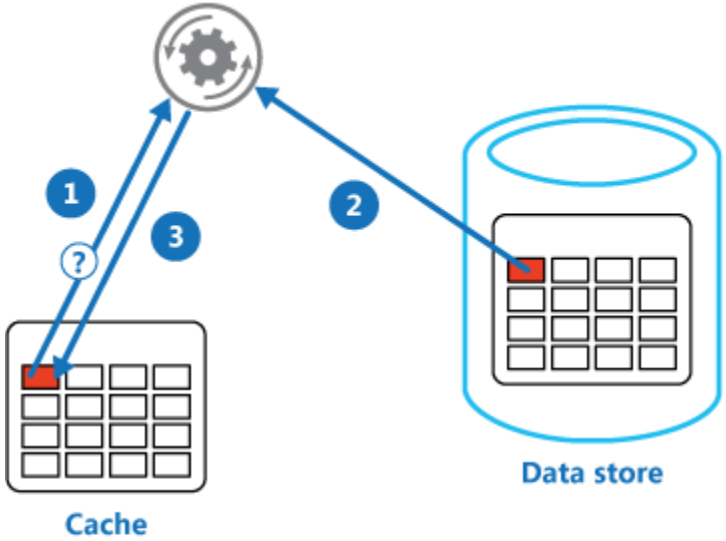
Monitor, Troubleshoot, and Optimize Azure Solutions

Monitor, Troubleshoot, and Optimize

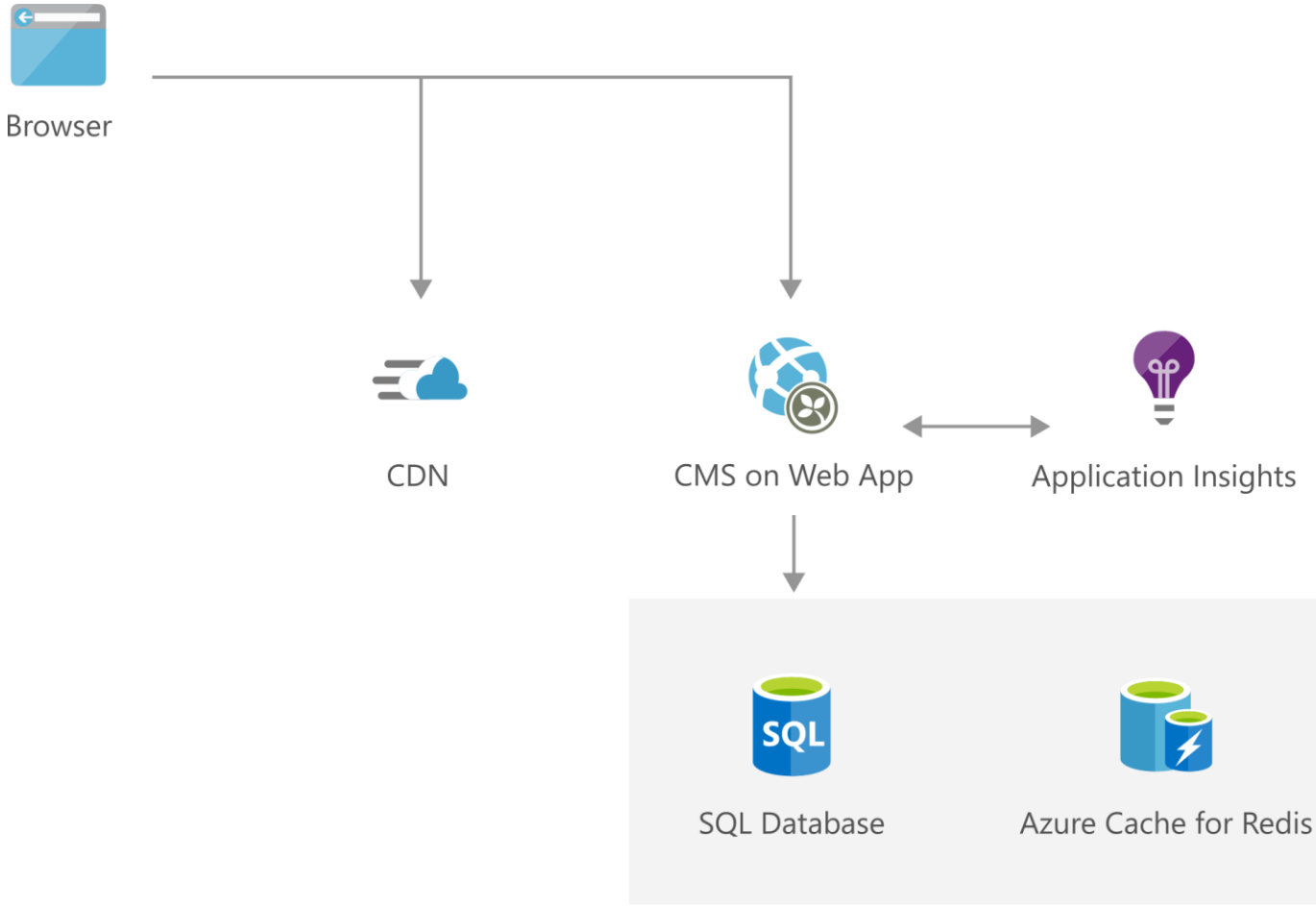
- Implement caching for solutions
- Troubleshoot solutions using metrics and log data

Implement caching for solutions

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

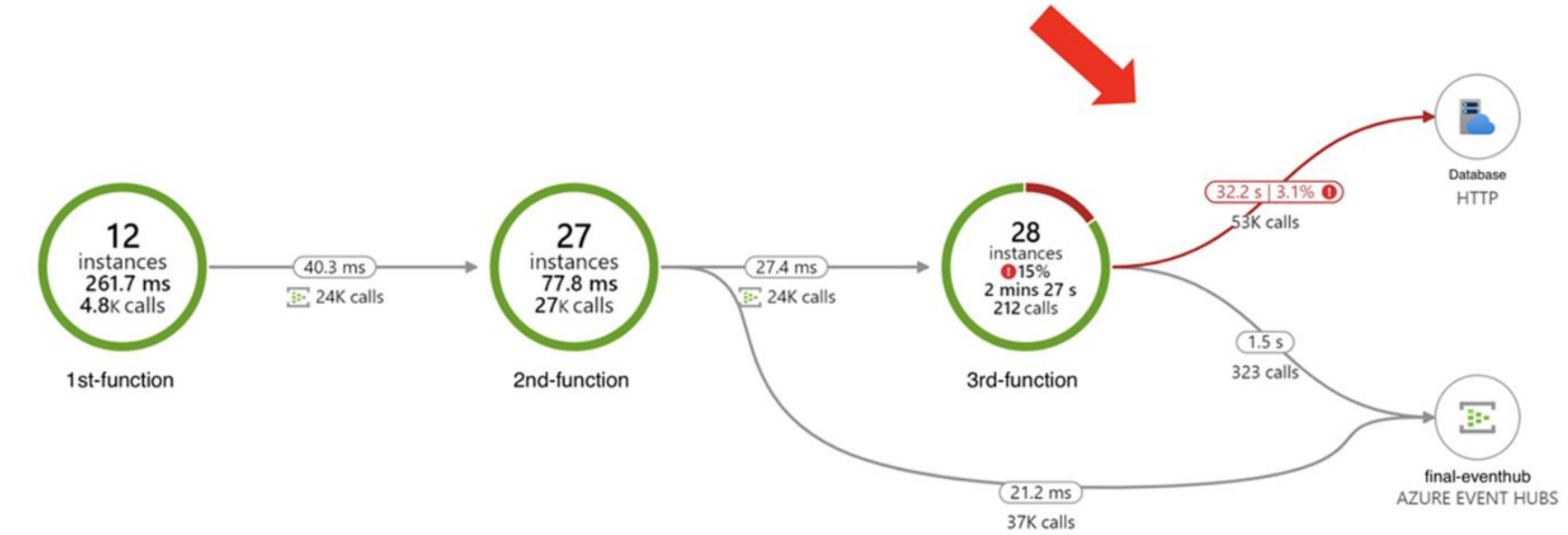


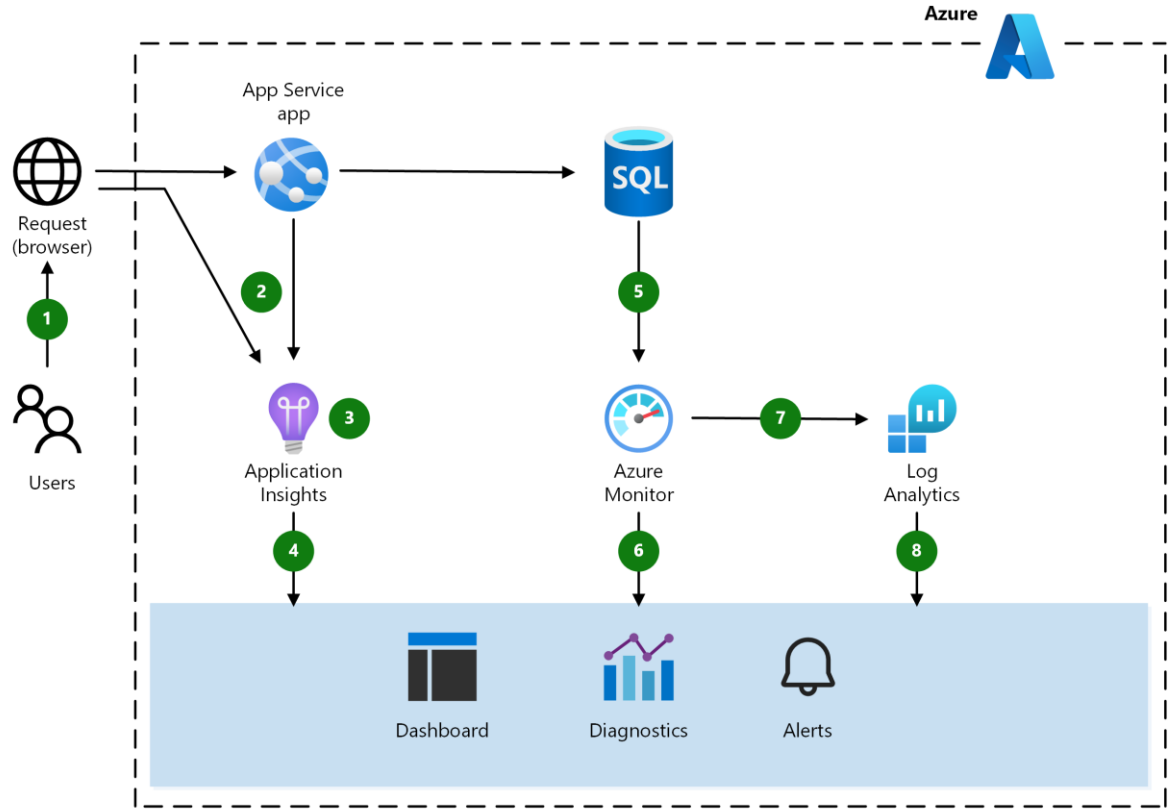
1: Determine whether the item is currently held in the cache.
2: If the item is not currently in the cache, read the item from the data store.
3: Store a copy of the item in the cache.


Browser
CDN
CMS on Web App
Application Insights
SQL
SQL Database
Azure Cache for Redis

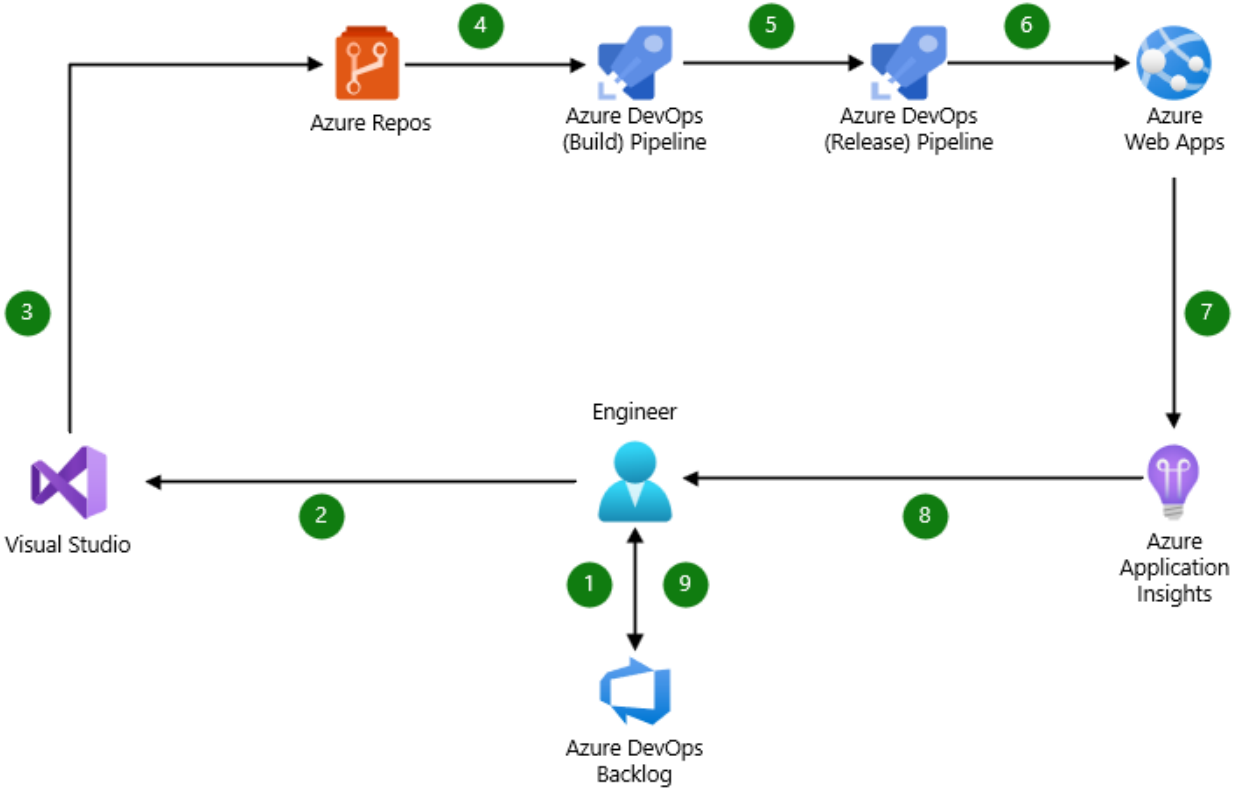
Troubleshoot solutions using metrics and log data

- 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]


12
instances
261.7 ms
4.8K calls
1st-function
40.3 ms
24K calls
27
instances
77.8 ms
27K calls
2nd-function
27.4 ms
24K calls
28
instances
15%
2 mins 27 s
212 calls
3rd-function
32.2 s | 3.1%
53K calls
Database
HTTP
1.5 s
323 calls
21.2 ms
37K calls
final-eventhub
AZURE EVENT HUBS



Microsoft Azure



Microsoft Azure

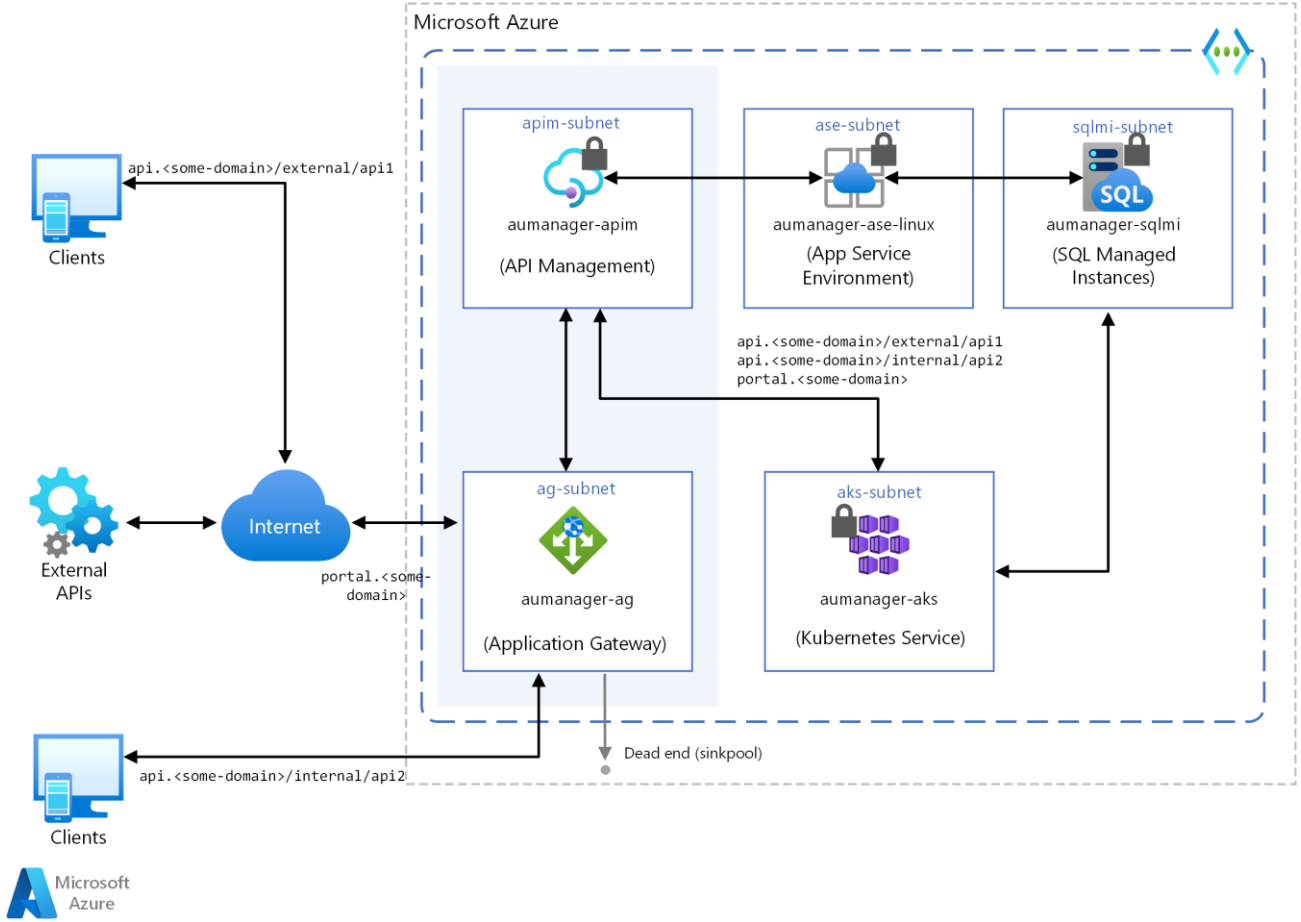
Connect to and Consume Azure Services and Third-party Services

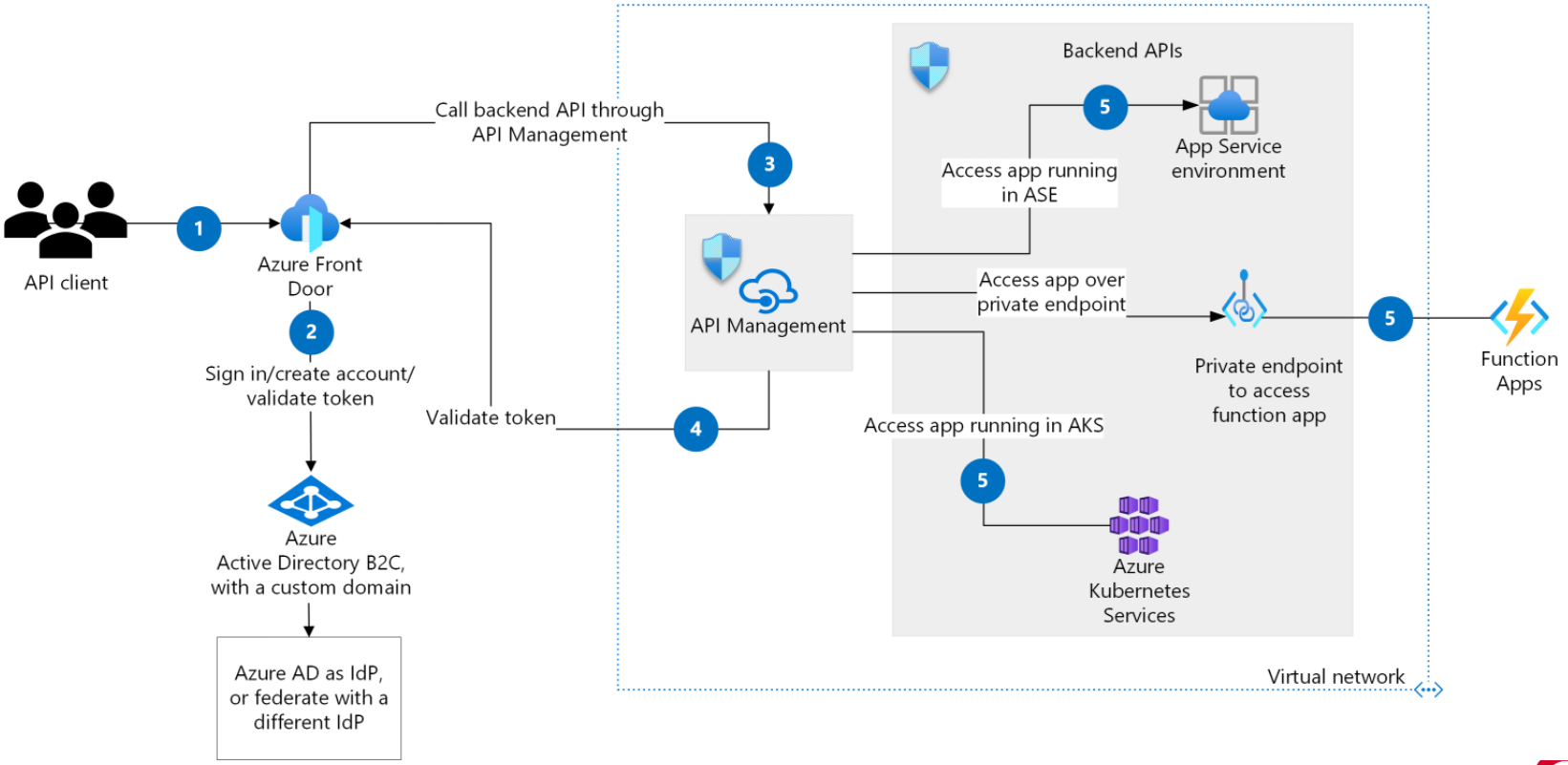
Consume Azure and Third-party Services

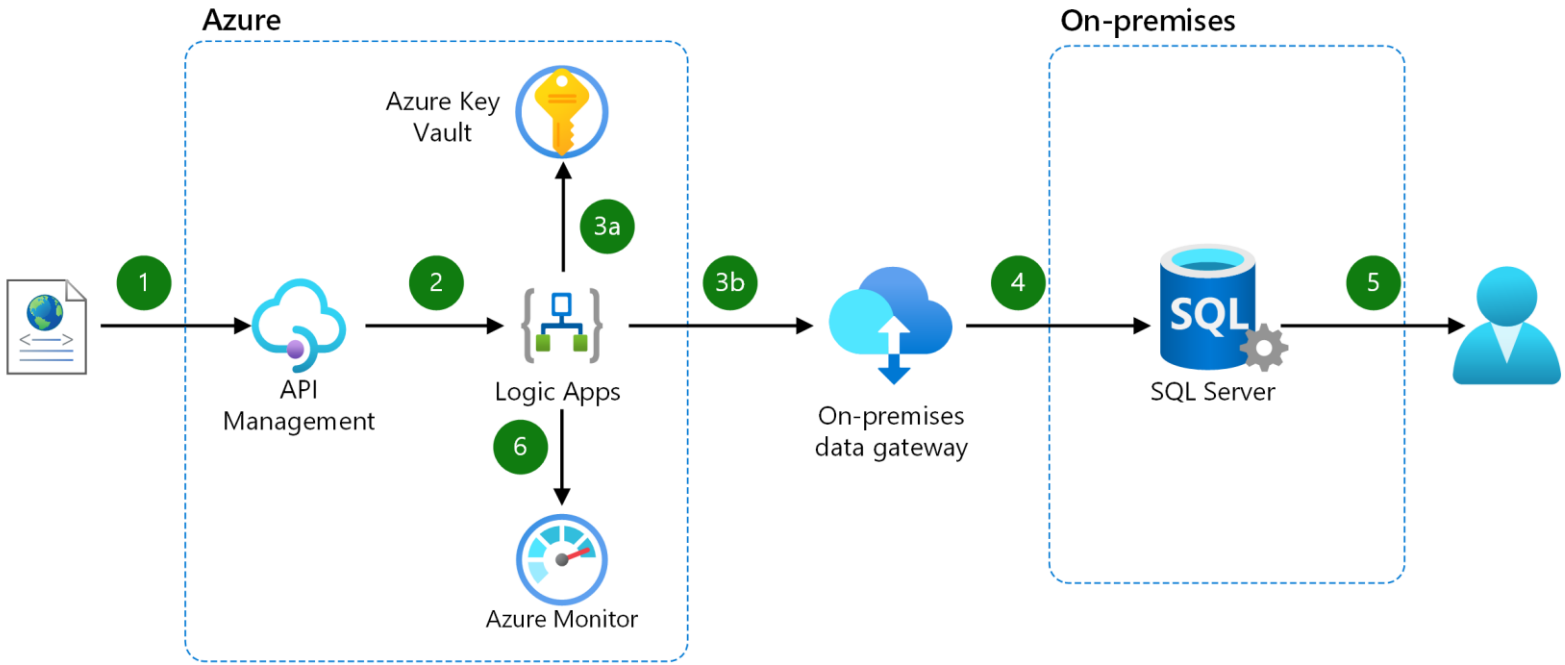
- Implement API Management
- Develop event-based solutions
- Develop message-based solutions

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]


Microsoft Azure
apim-subnet
aumanager-apim
(API Management)
ase-subnet
aumanager-ase-linux
(App Service Environment)
sqlmi-subnet
SQL
aumanager-sqlmi
(SQL Managed Instances)
api.<some-domain>/external/api1
Clients
api.<some-domain>/external/api1
api.<some-domain>/internal/api2
portal.<some-domain>
External APIs
Internet
portal.<some-domain>
ag-subnet
aumanager-ag
(Application Gateway)
aks-subnet
aumanager-aks
(Kubernetes Service)
Dead end (sinkpool)
api.<some-domain>/internal/api2
Clients
Microsoft Azure


API client
1
Azure Front Door
2
Sign in/create account/ validate token
Azure Active Directory B2C, with a custom domain
Azure AD as IdP, or federate with a different IdP
Call backend API through API Management
3
Validate token
4
API Management
Backend APIs
5
App Service environment
Access app running in ASE
Access app over private endpoint
Private endpoint to access function app
5
Function Apps
Access app running in AKS
5
Azure Kubernetes Services
Virtual network



Microsoft Azure

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]

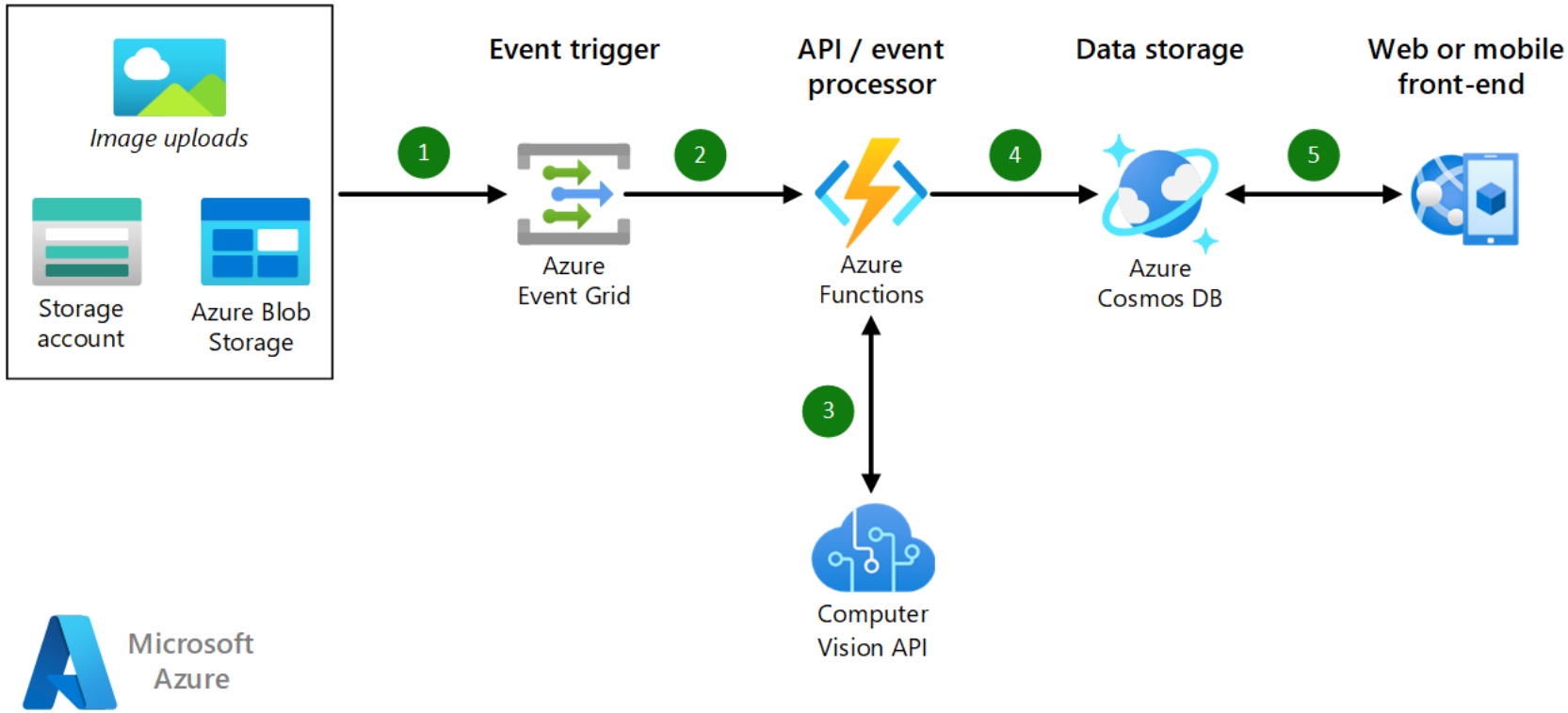
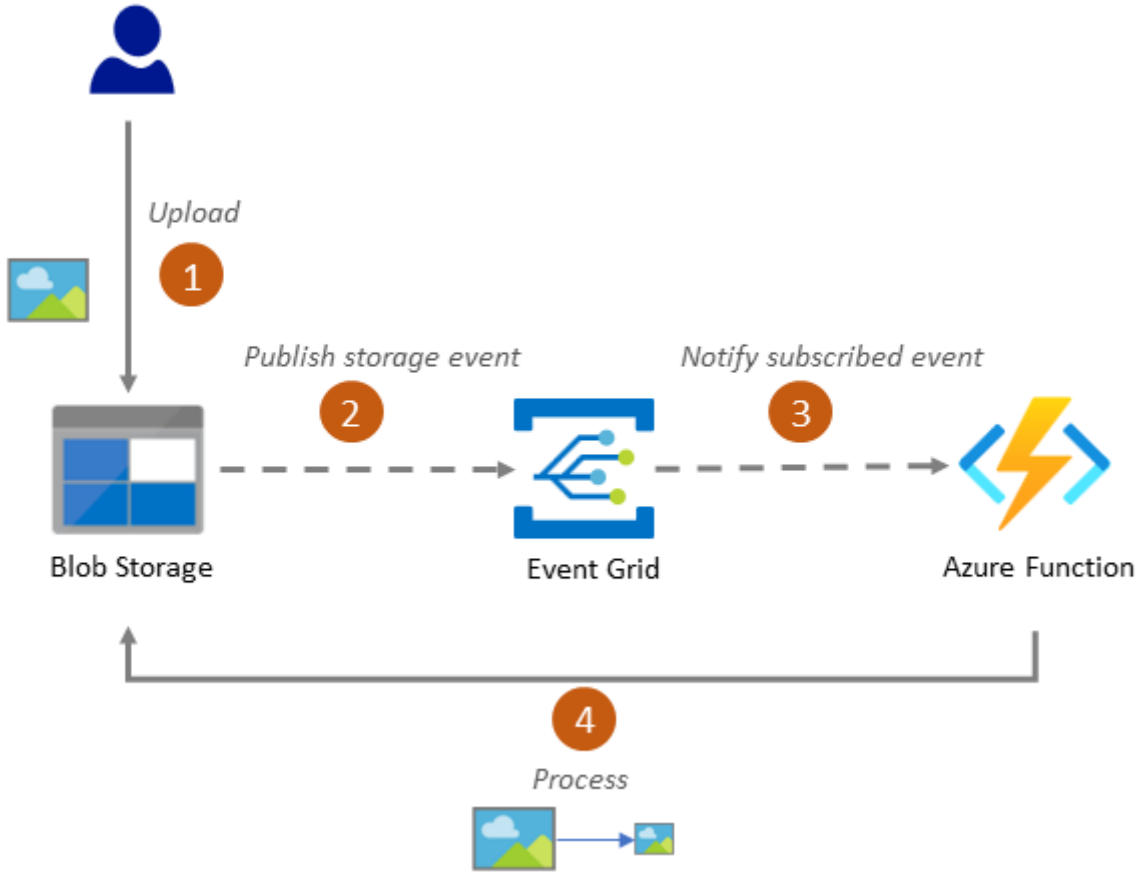
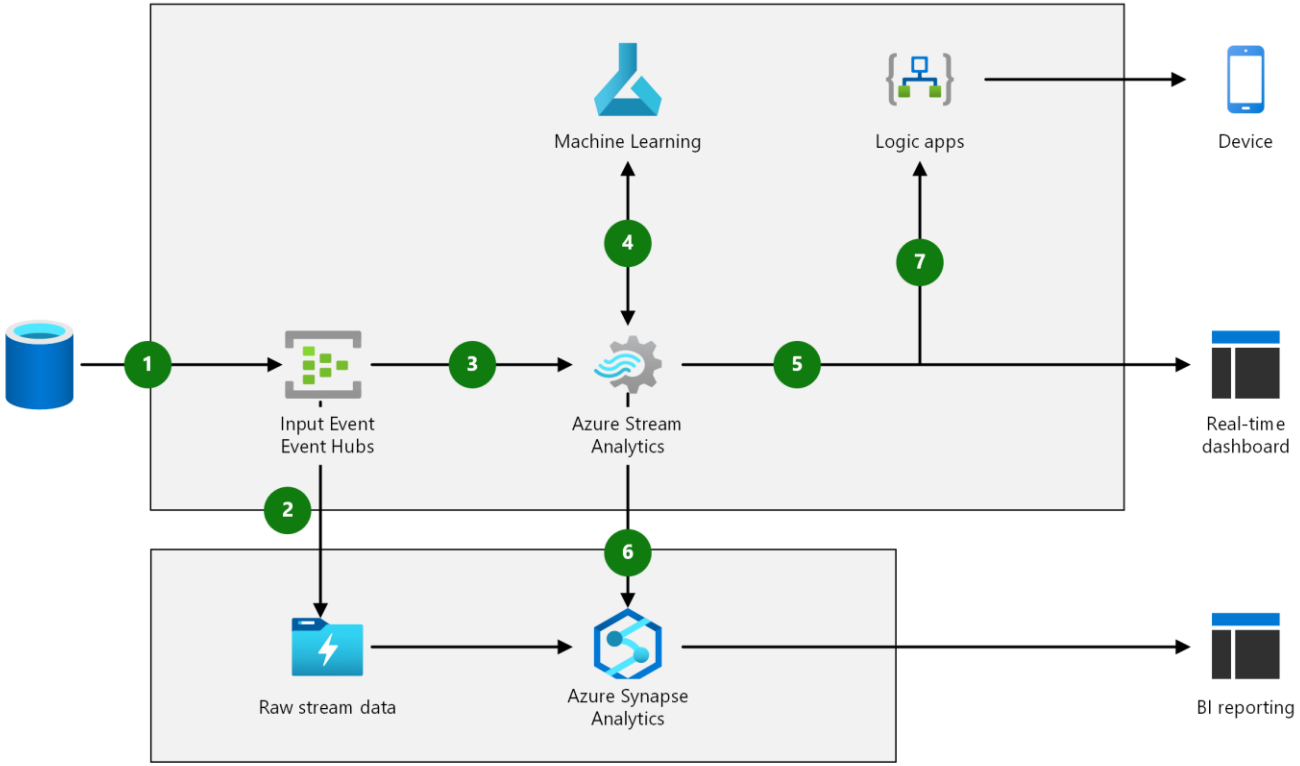


Image uploads
Storage account
Azure Blob Storage
Event trigger
API / event processor
Data storage
Web or mobile front-end
1
2
3
4
5
Azure Event Grid
Azure Functions
Azure Cosmos DB
Computer Vision API
Microsoft Azure


Upload
1
Publish storage event
2
Notify subscribed event
3
Blob Storage
Event Grid
Azure Function
4
Process

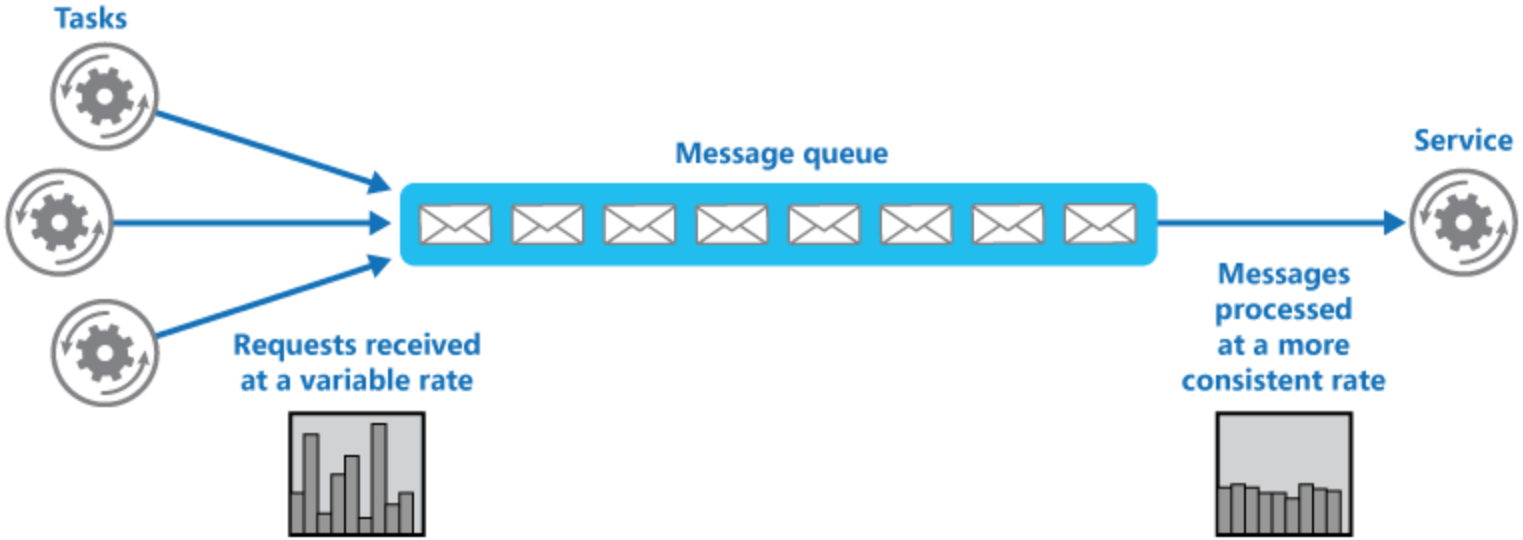
Microsoft Azure

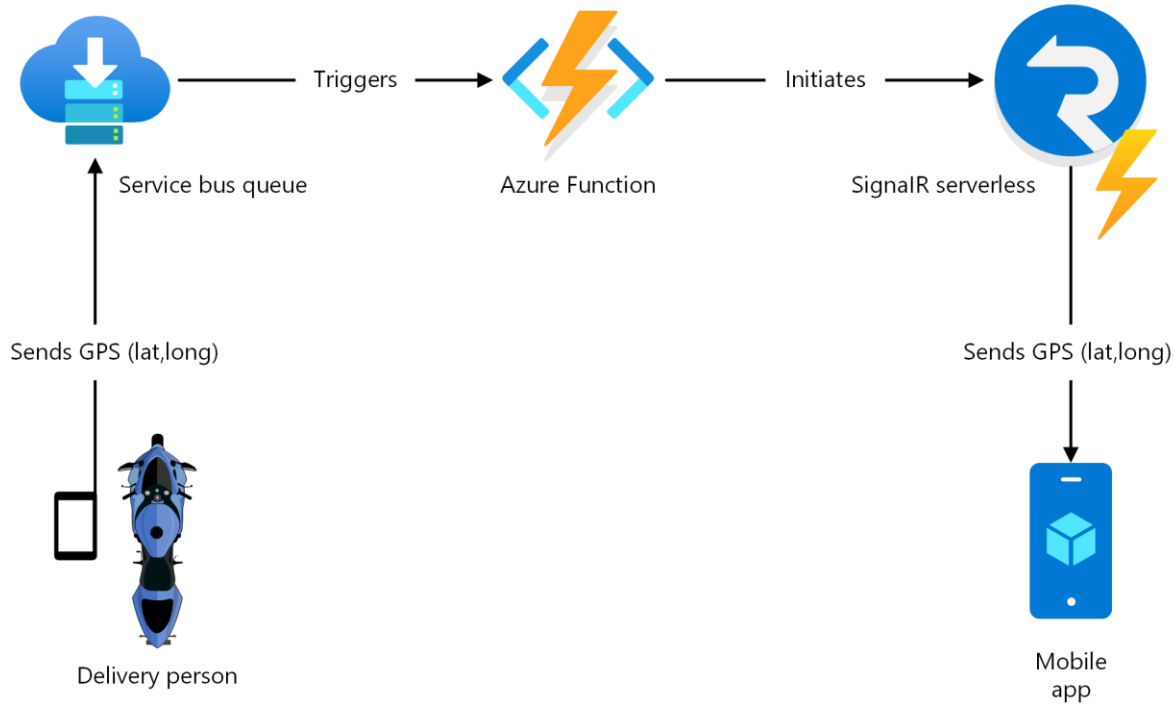


Microsoft Azure

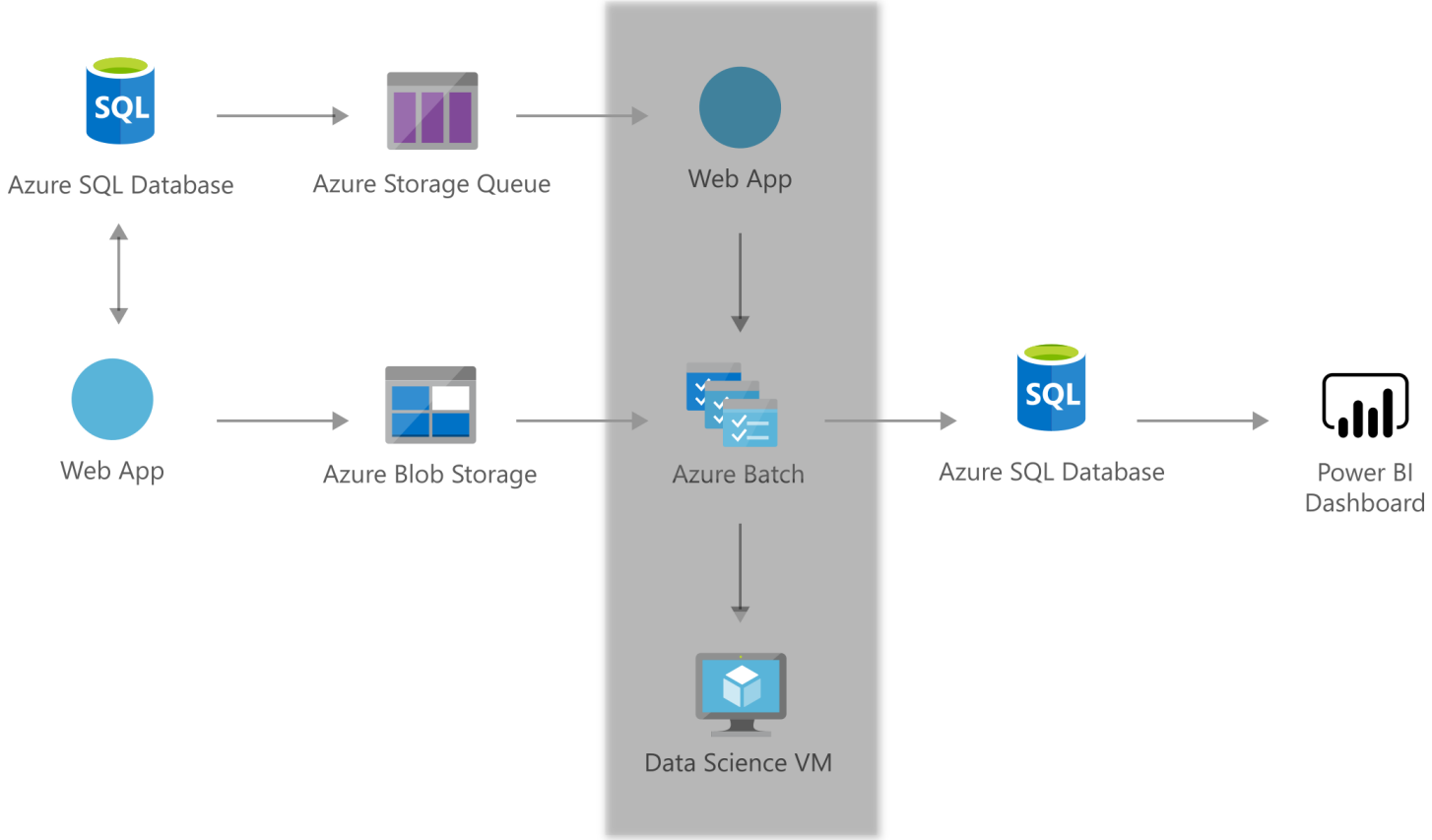
Develop message-based solutions

- 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



Microsoft Azure


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

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

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

Review and confirm contact information to avoid issues on test day.

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

Order #: 0064-8802-7606

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

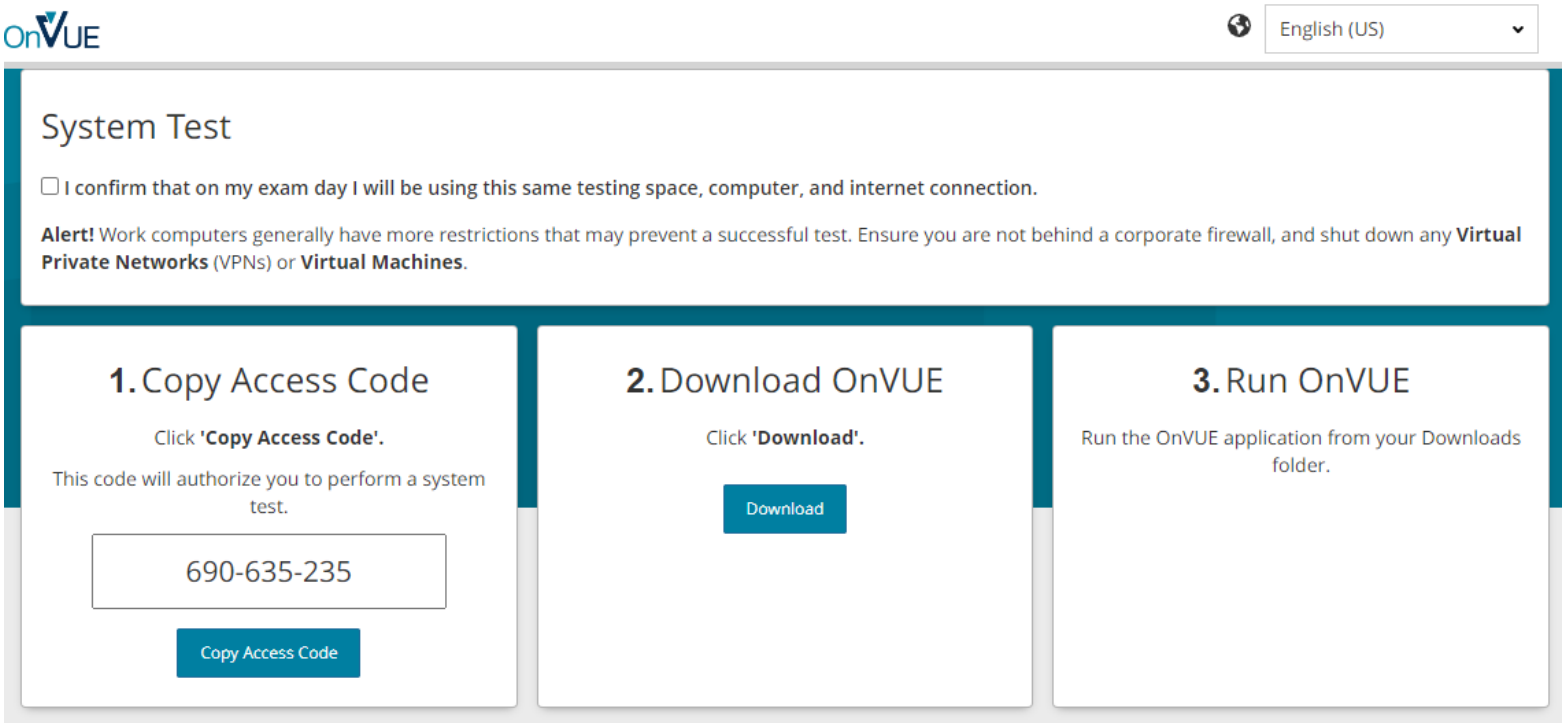
What's next?

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


OnVUE
English (US)
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