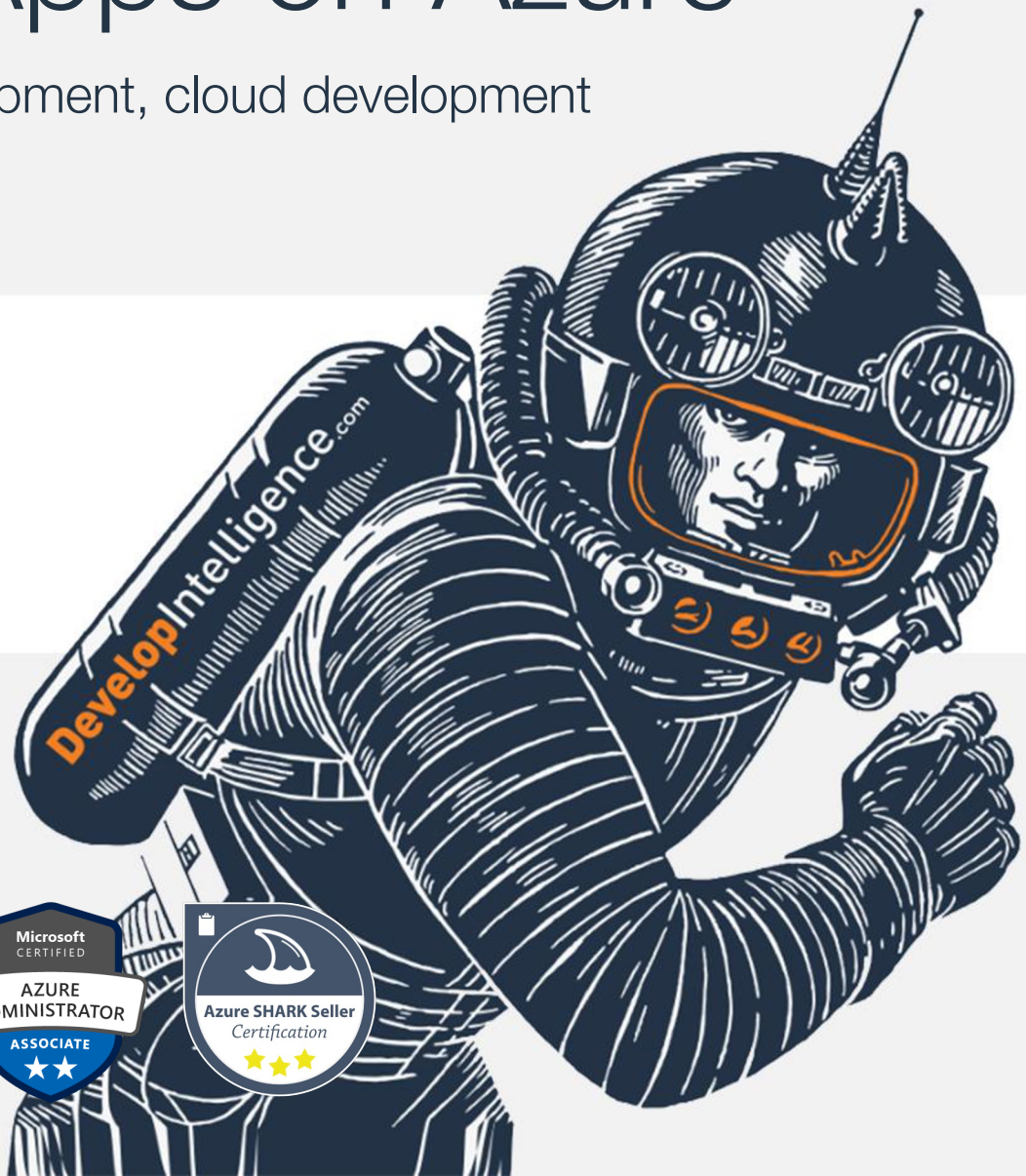
Developing Scalable Apps on Azure

Designed to demonstrate enterprise software development, cloud development and delivery.

Develop Intelligence



With Siddharth Dhawan
Microsoft Certified Trainer - Azure

Microsoft Certified Trainer MCT Trainer 2020 - 2021

Microsoft Certified Azure Solutions Architect Expert

Microsoft Certified DevOps Engineer Expert

Microsoft Certified Azure Security Engineer Associate

Microsoft Certified Azure Developer Associate

Microsoft Certified Azure Administrator Associate

Azure SHARK Seller Certification

Module Layout – Day 2

Develop Intelligence

What is Cloud Storage?

Azure Storage Services

Ensuring Business Continuity

Using Storage Services Programmatically

Azure Storage Security

Quiz

Module Layout – Day 1

Develop Intelligence

What is Cloud Storage?	Azure Storage Services
Ensuring Business Continuity	Using Storage Services Programmatically
Azure Storage Security	Quiz

What is Cloud Storage?

Managed, Durable, Secure, Scalable and highly available

Accessible via SDKs, REST APIs...

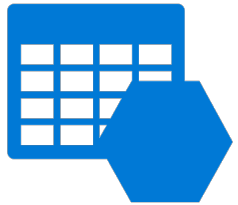
Azure Storage is a Cloud Storage Service offering inside Microsoft Azure

Module Layout – Day 1

Develop Intelligence

What is Cloud Storage?	Azure Storage Services
Ensuring Business Continuity	Using Storage Services Programmatically
Azure Storage Security	Quiz

Microsoft Azure Storage



Accessible vis REST API

Blobs

Tables

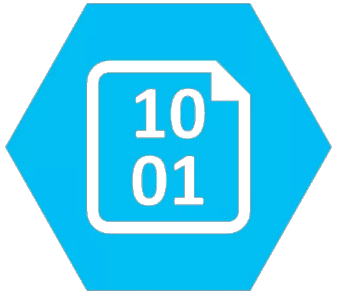
Queues

Designed for Azure VMs

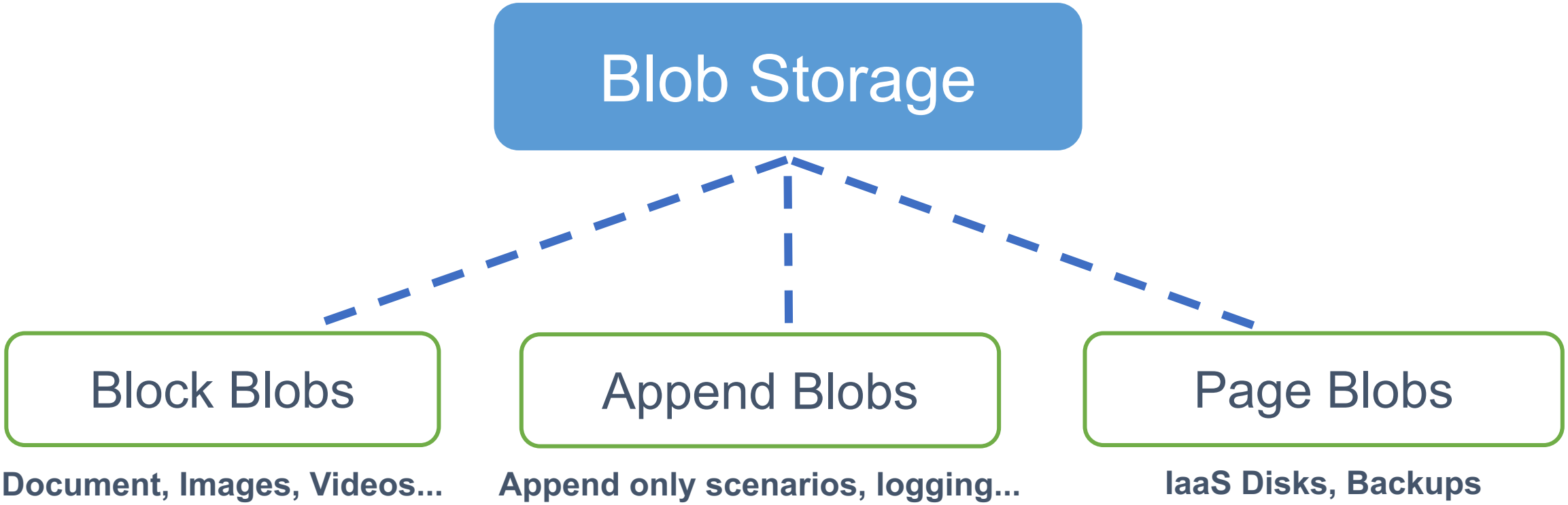
File Share

Disks

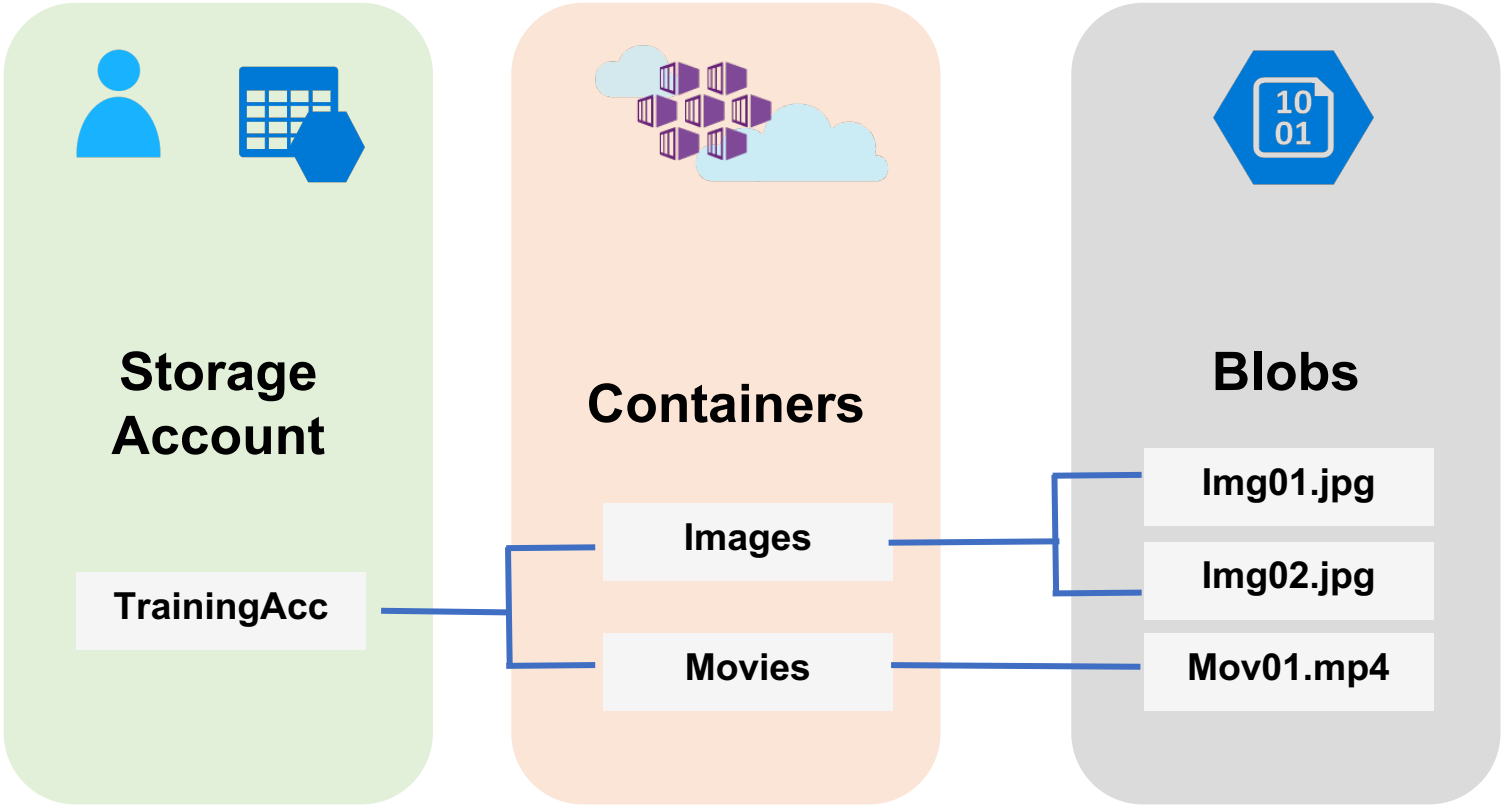
Blob Storage



- Serving images or documents directly to a browser.
- Storing files for distributed access.
- Streaming video and audio.
- Storing data for backup and restore, disaster recovery, and archiving.
- Storing data for analysis by an on-premises or Azure-hosted service.


Blob Storage
Block Blobs
Append Blobs
Page Blobs
Document, Images, Videos...
Append only scenarios, logging...
IaaS Disks, Backups

Azure Blob Structure



Blob Access Tiers

Develop Intelligence

Hot Access Tier

Highest storage cost
Lowest data access cost

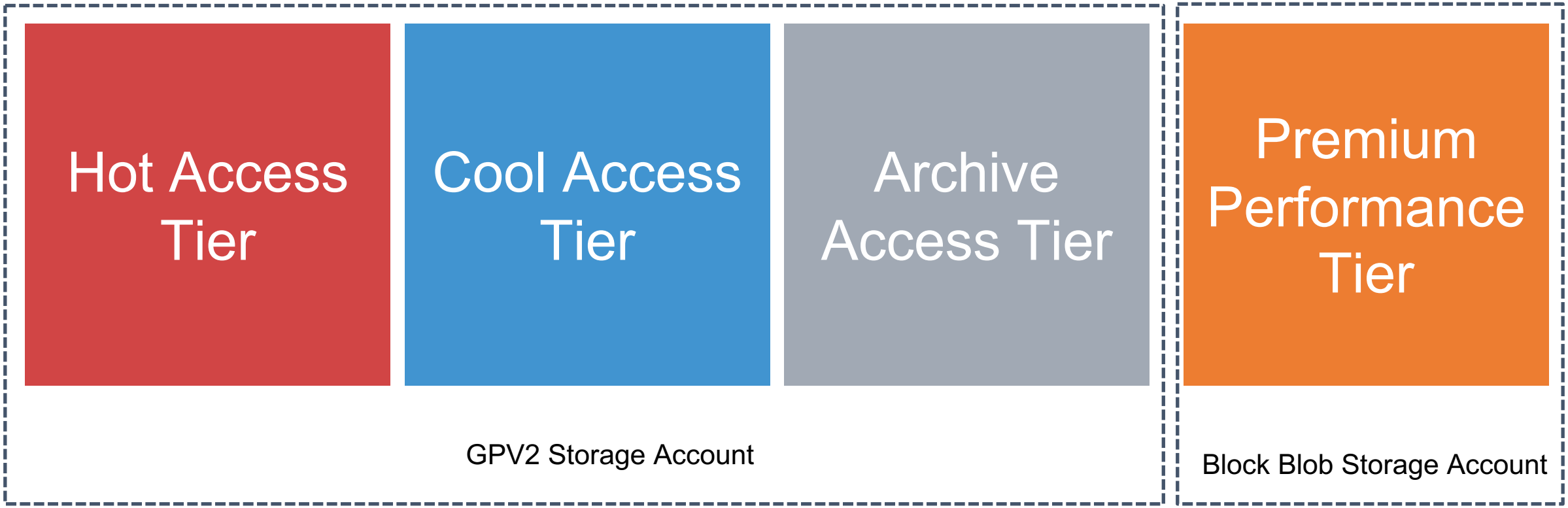
Cool Access Tier

Lower storage cost
Higher data access cost

Archive Access Tier

Lowest storage cost
Highest data retrieval cost

Blob Lifecyle Management



Demo

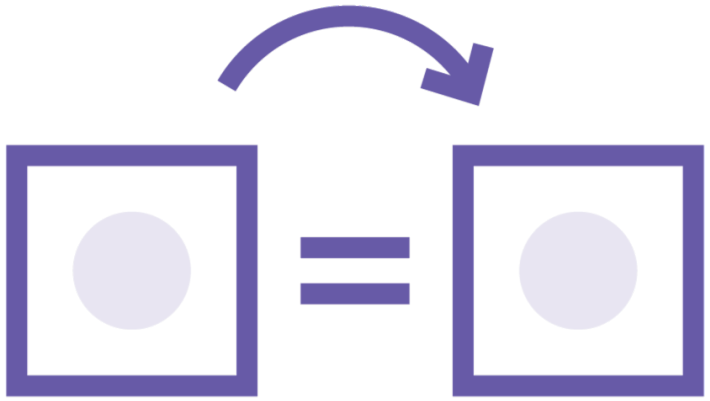
- Create Azure Storage Account
- Azure Storage Explorer
- Lifecycle Management

Module Layout – Day 1

Develop Intelligence

What is Cloud Storage?	Azure Storage Services
Ensuring Business Continuity	Using Storage Services Programmatically
Azure Storage Security	Quiz

Storage Account Replication



Availability and durability

Disaster recovery

Recovery time objectives

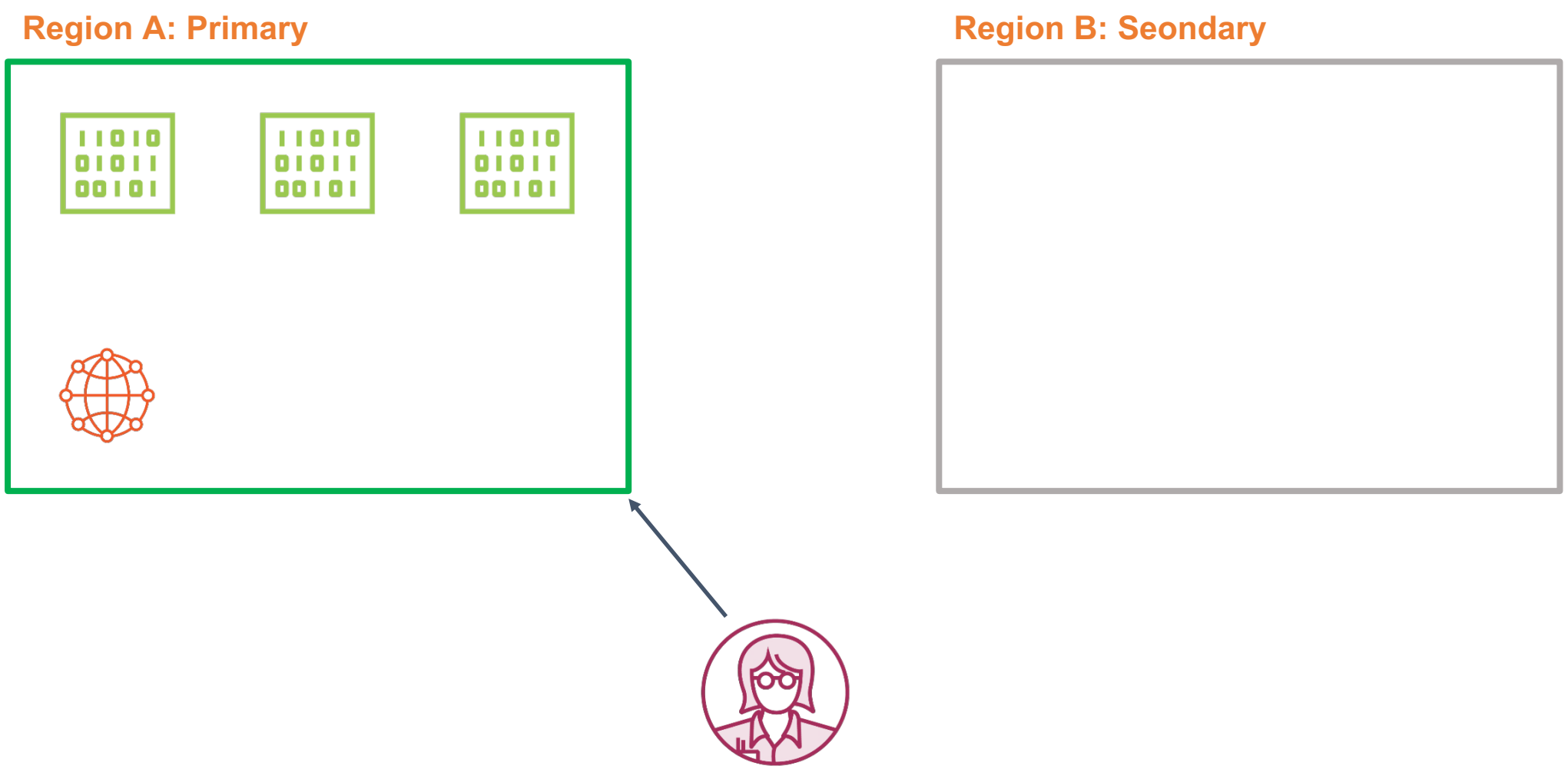
Read-only access to a secondary region

Storage Account Replication

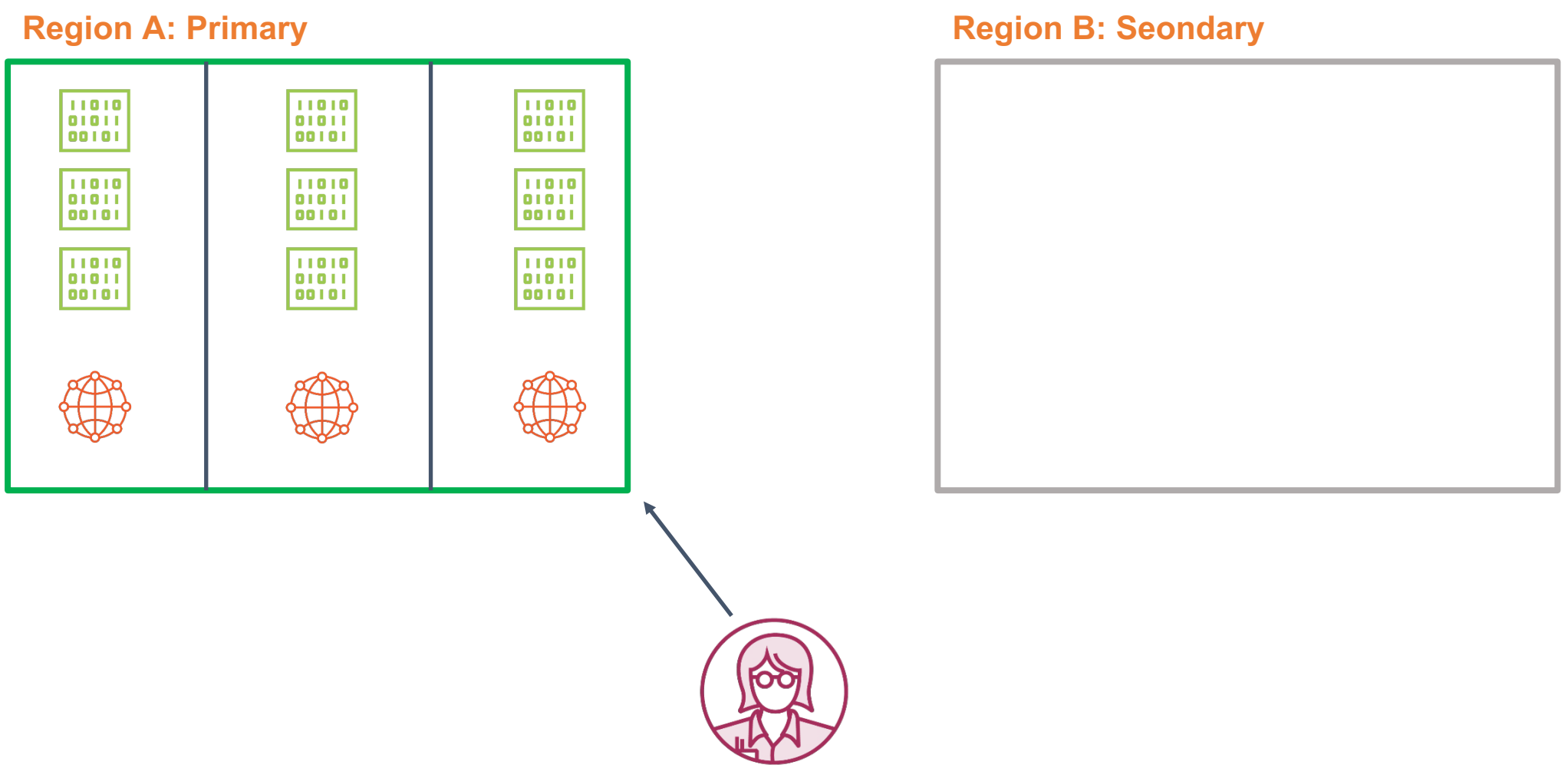
Develop Intelligence

- Redundancy in the Primary Region
- Redundancy in a Secondary Region
- Read Access to Data in the Secondary Region

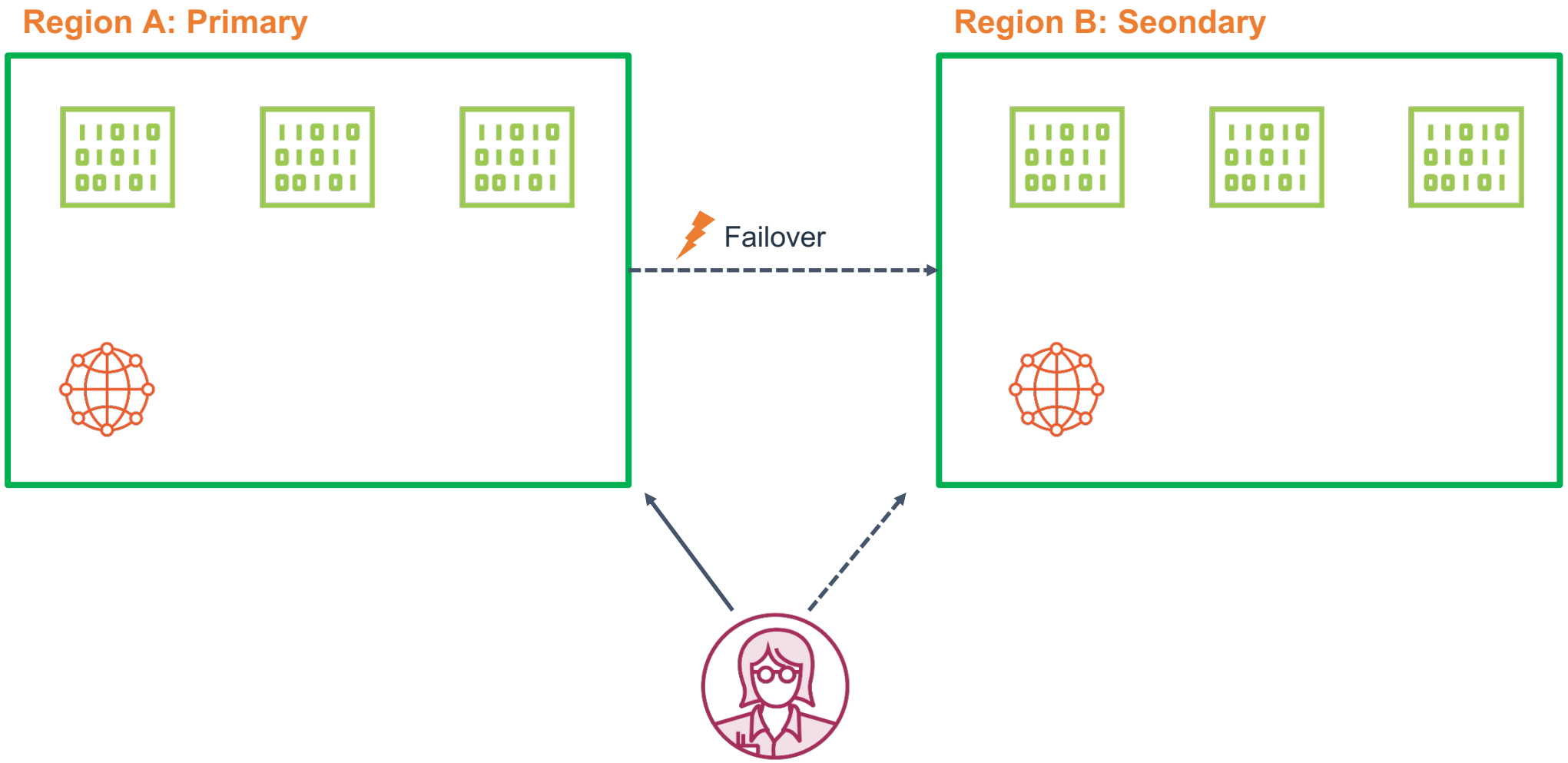
Locally Redundant Storage (LRS)



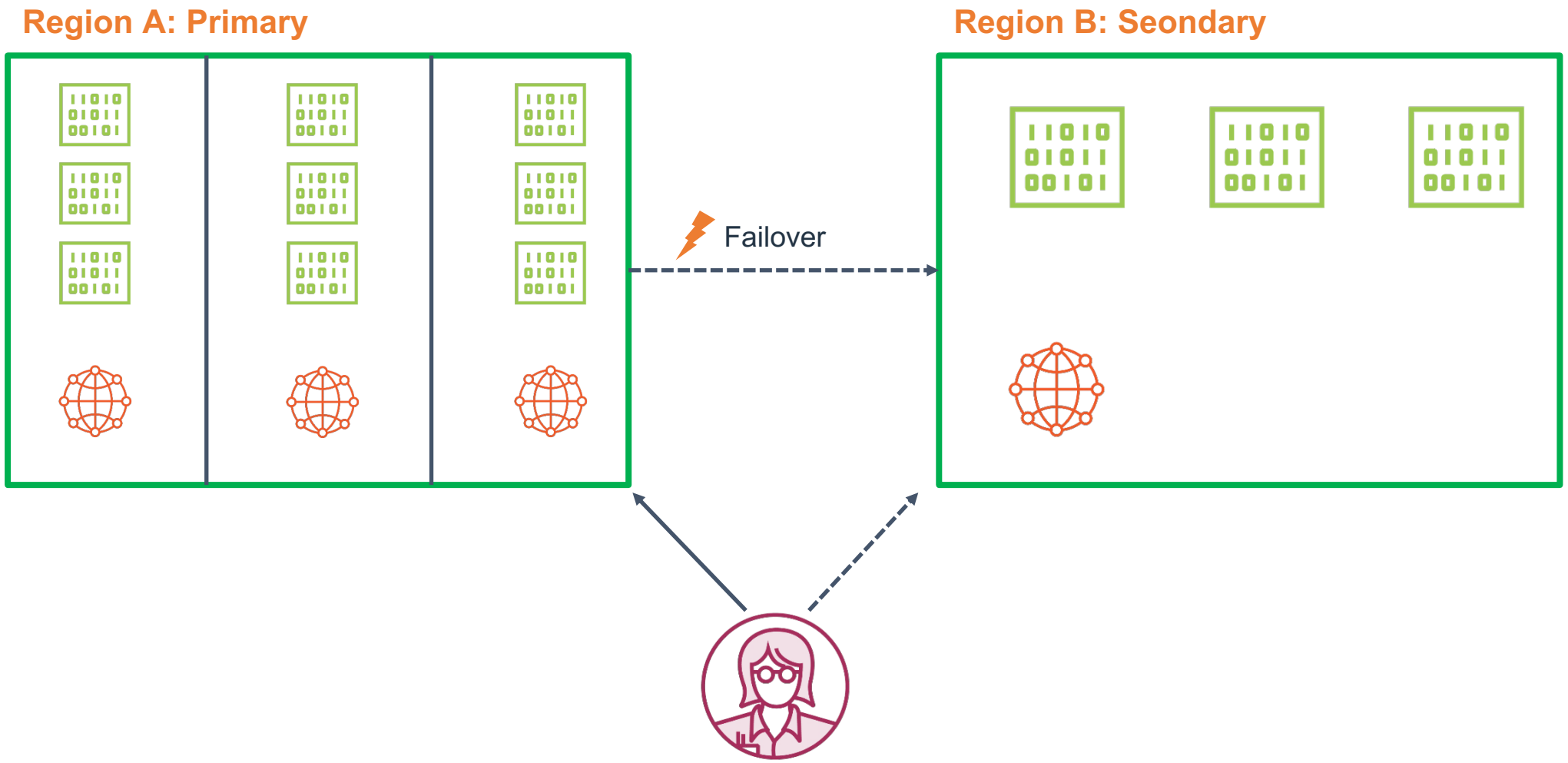
Zone Redundant Storage (ZRS)



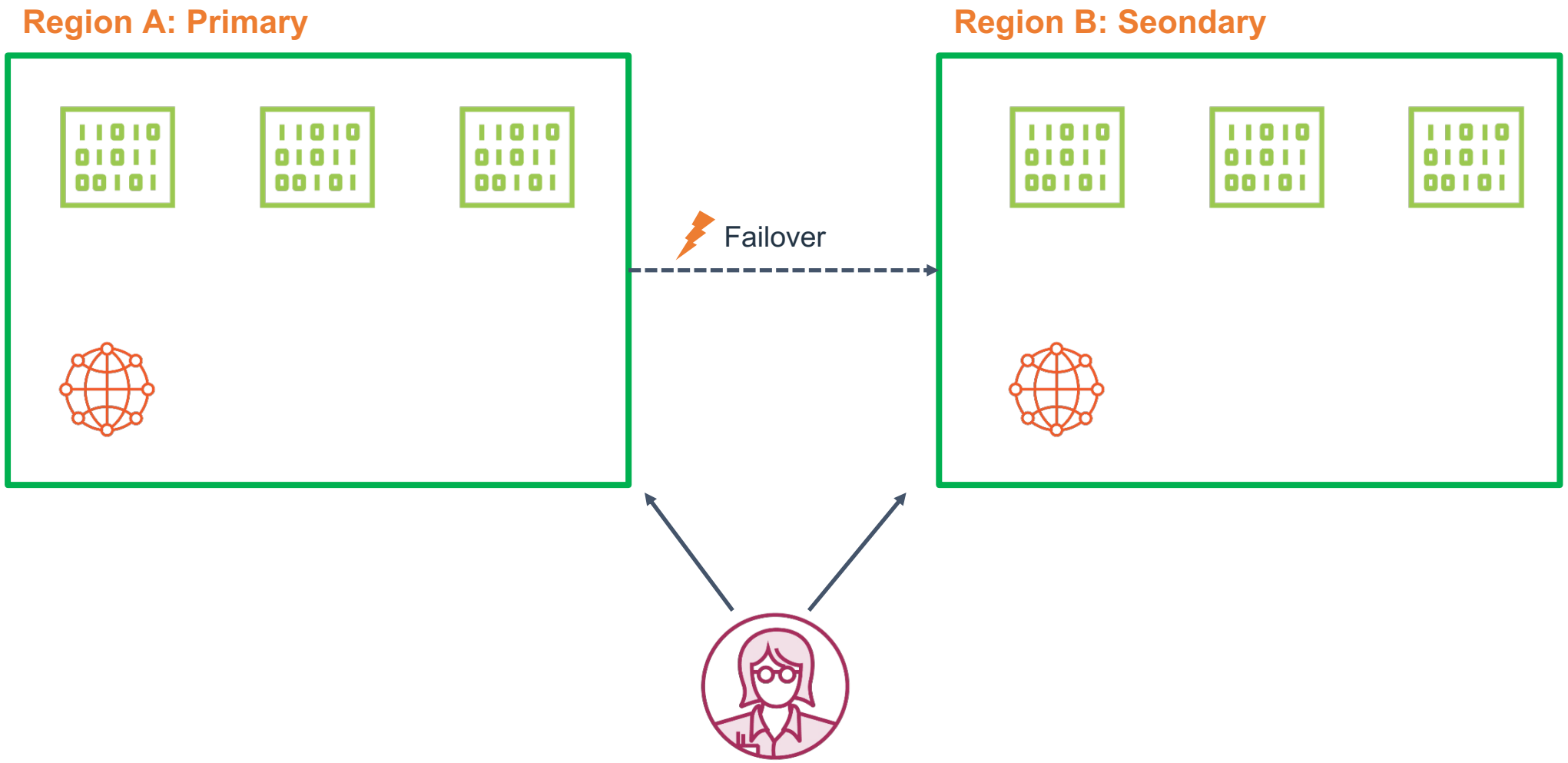
Geo Redundant Storage (GRS)



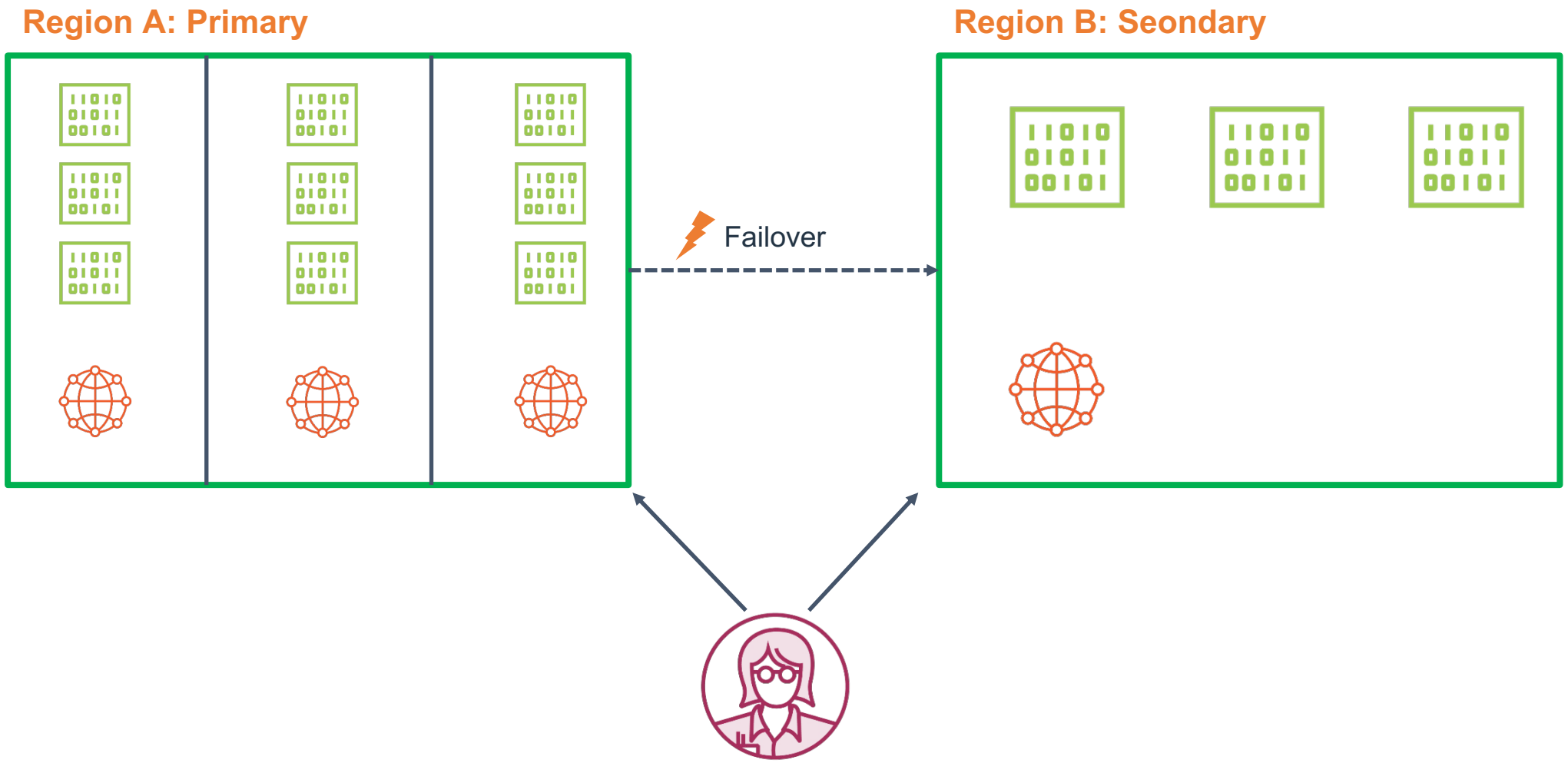
Geo Zone Redundant Storage (GZRS)



Read Access - Geo Redundant Storage (RA-GRS)



Read Access Geo Zone Redundant Storage (RA-GZRS)



Module Layout – Day 2

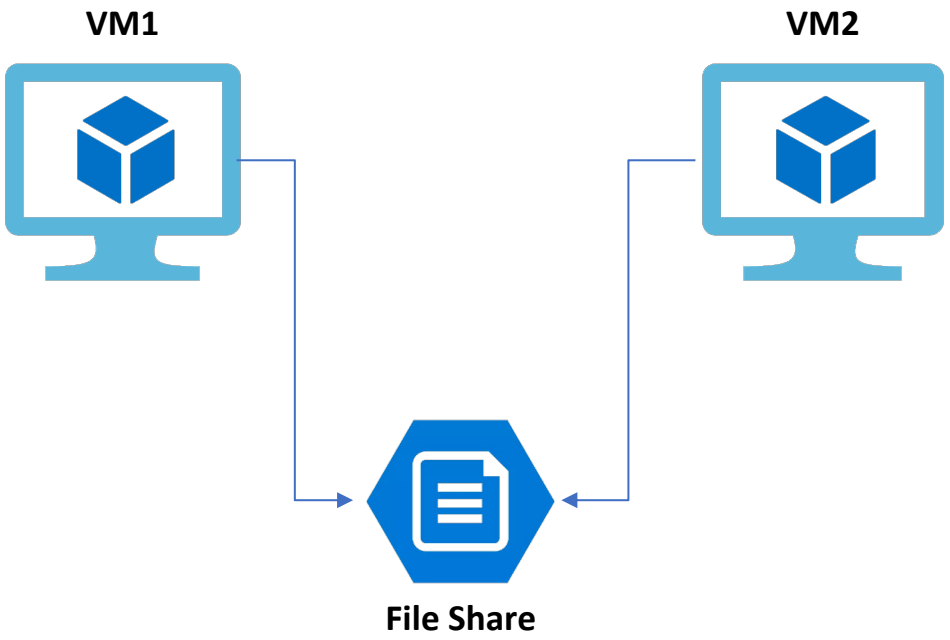
Develop Intelligence

What is Cloud Storage?	Azure Storage Services
Ensuring Business Continuity	**Using Storage Services Programmatically**
Azure Storage Security	Quiz

Demo

- Configure Replication
- Initiate Failover
- Working with Blob Operations using .NET SDK

File Share



Highly available network file share

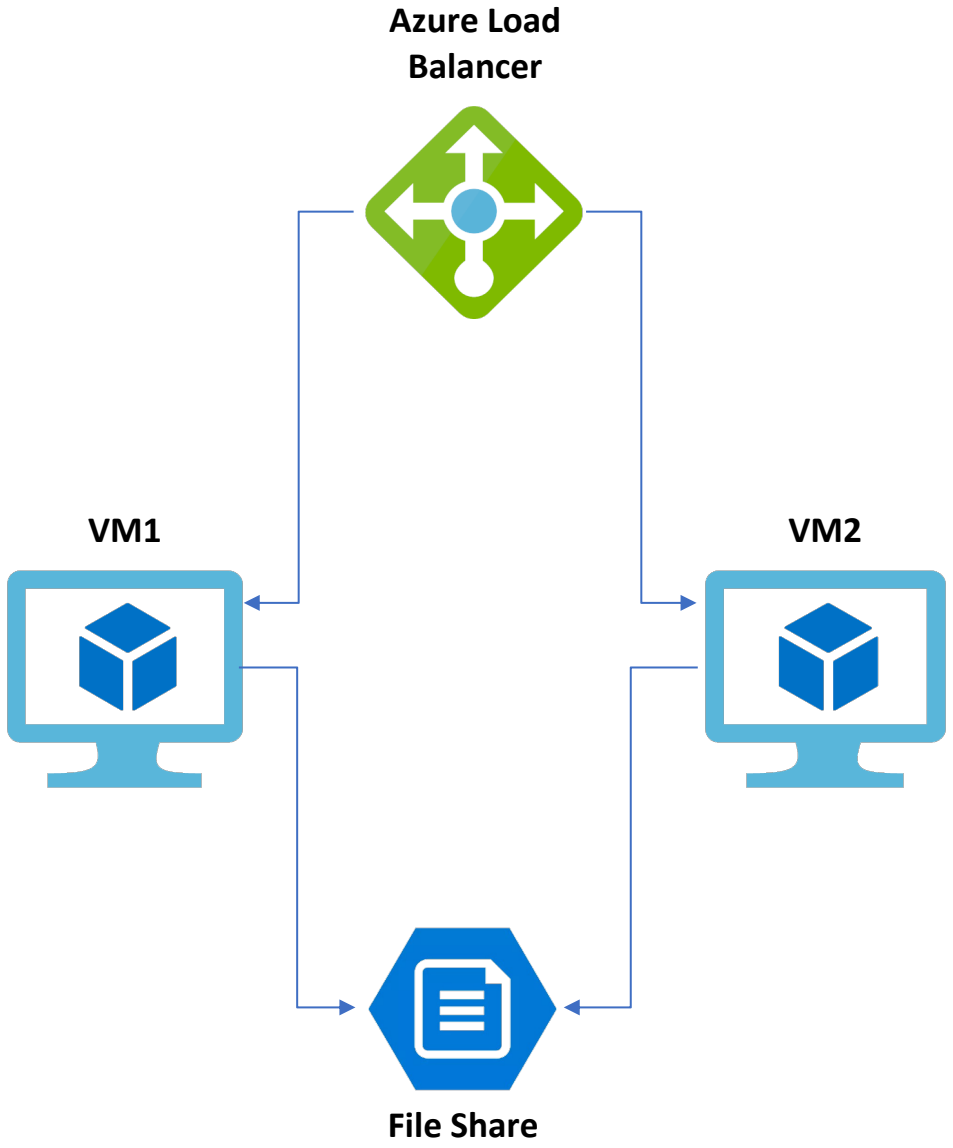
Can be accessed by using the standard Server Message Block (SMB) protocol

That means that multiple VMs can share the same files with both read and write access. You can also read the files using the REST interface or the storage client libraries.

Diagnostic logs, metrics, and crash dumps

Configuration files shared across VMs

Lift and shift legacy apps



Azure Storage Queues

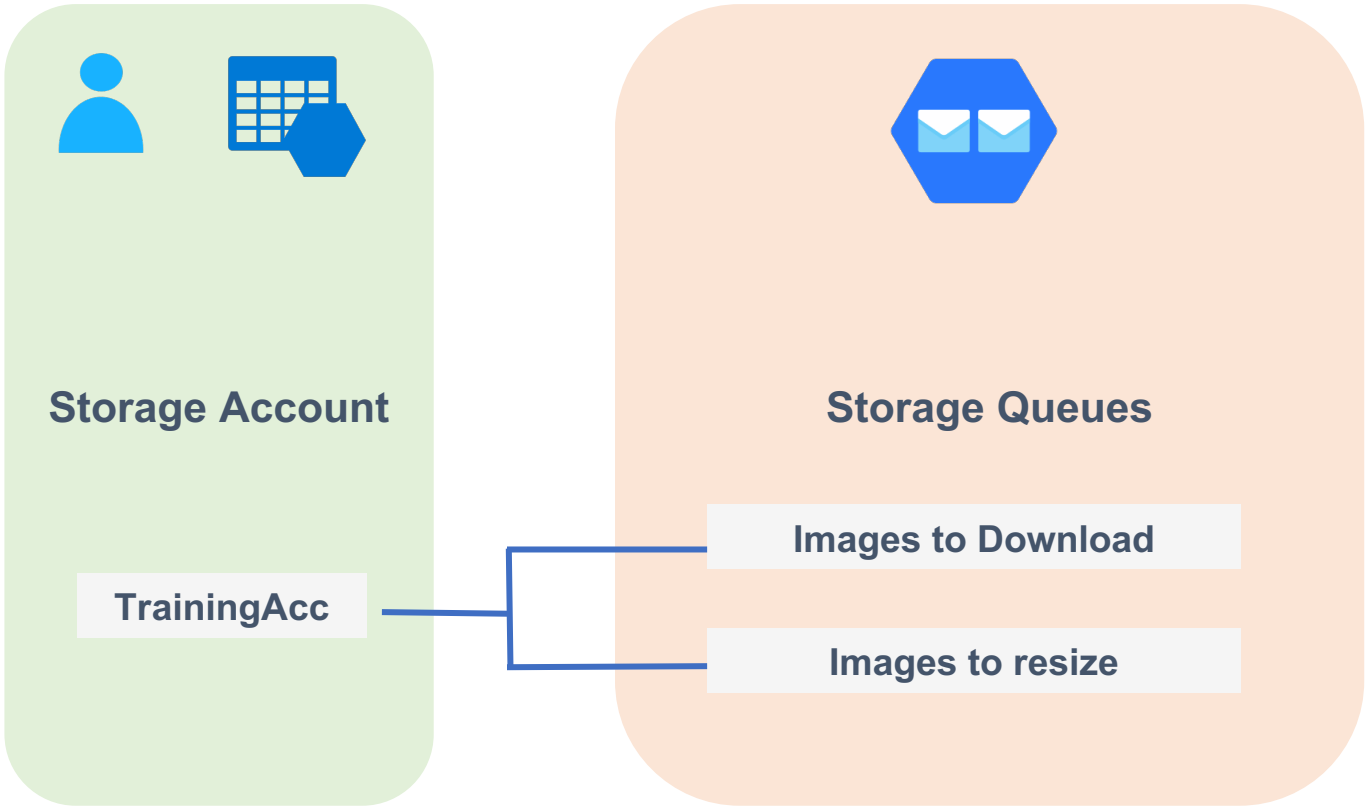
A message, in any format, of up to 64 KB.

The maximum time that a message can remain in the queue is seven days.

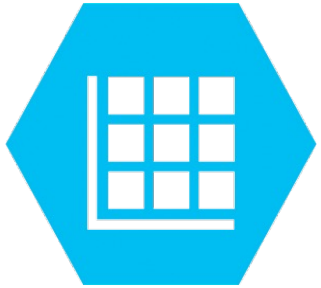
Common uses of Queue storage include:

- Creating a backlog of work to process asynchronously
- Passing messages from an Azure web role to an Azure worker role

Azure Queue Structure



Azure Table Storage

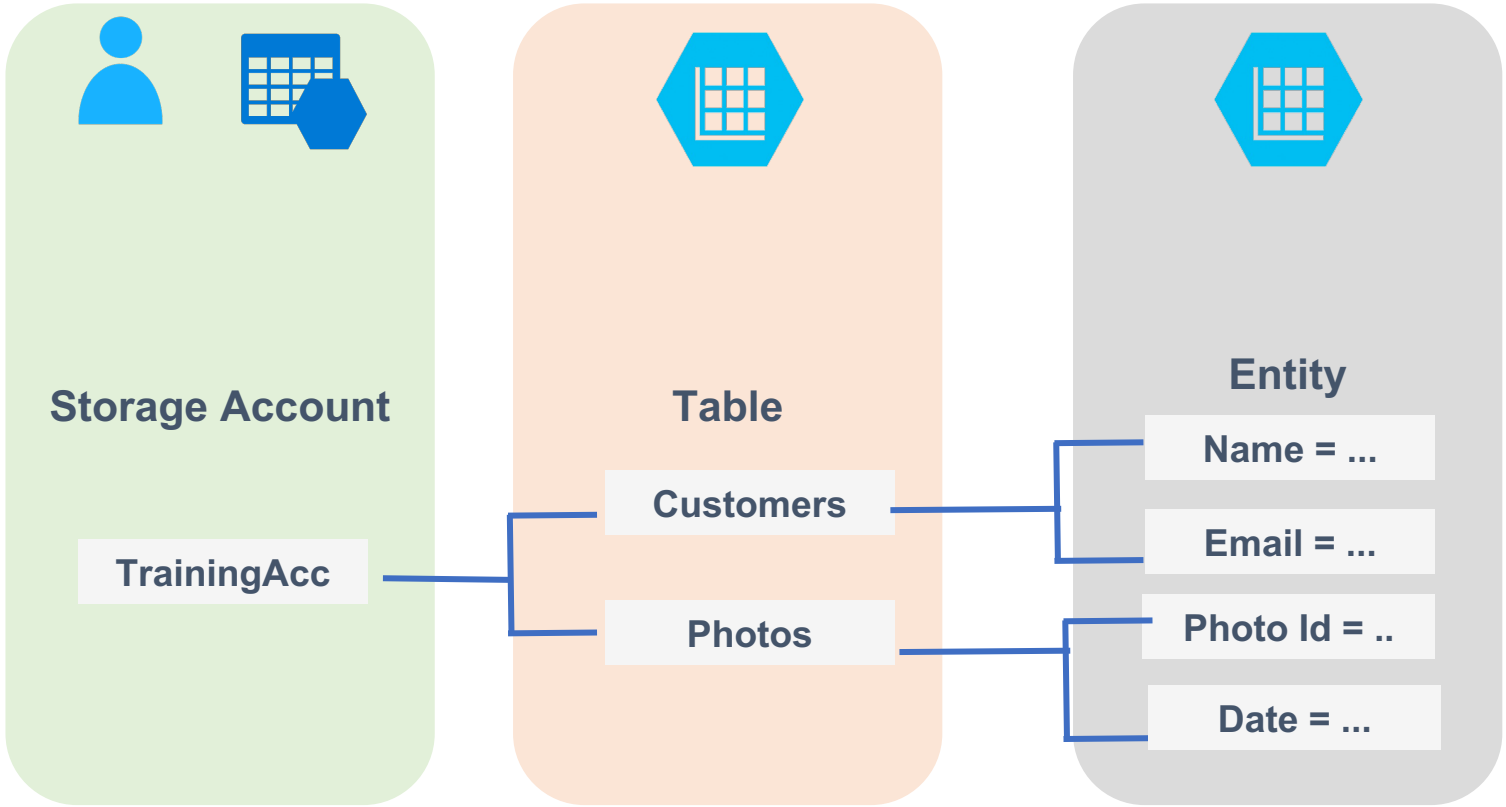


Ideal for storing structured, non-relational data in cloud

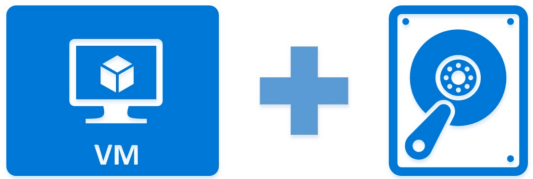
Accessed using LINQ queries with WCF Data Service .NET Libraries

To store flexible datasets like user data for web applications, address books, device information

Azure Tables Structure



Azure Storage Disks



Persistent, highly-secured disk options which support virtual machines

Azure Disk Storage provides the durability, availability and security you need for your virtual machines

Premium Disk Storage (SSD) for I/O-intensive applications

Standard SSD for entry-level production workloads that demand consistent performance

Module Layout – Day 1

Develop Intelligence

What is Cloud Storage?	Azure Storage Services
Ensuring Business Continuity	Using Storage Services Programmatically
Azure Storage Security	Quiz

Azure Storage Security

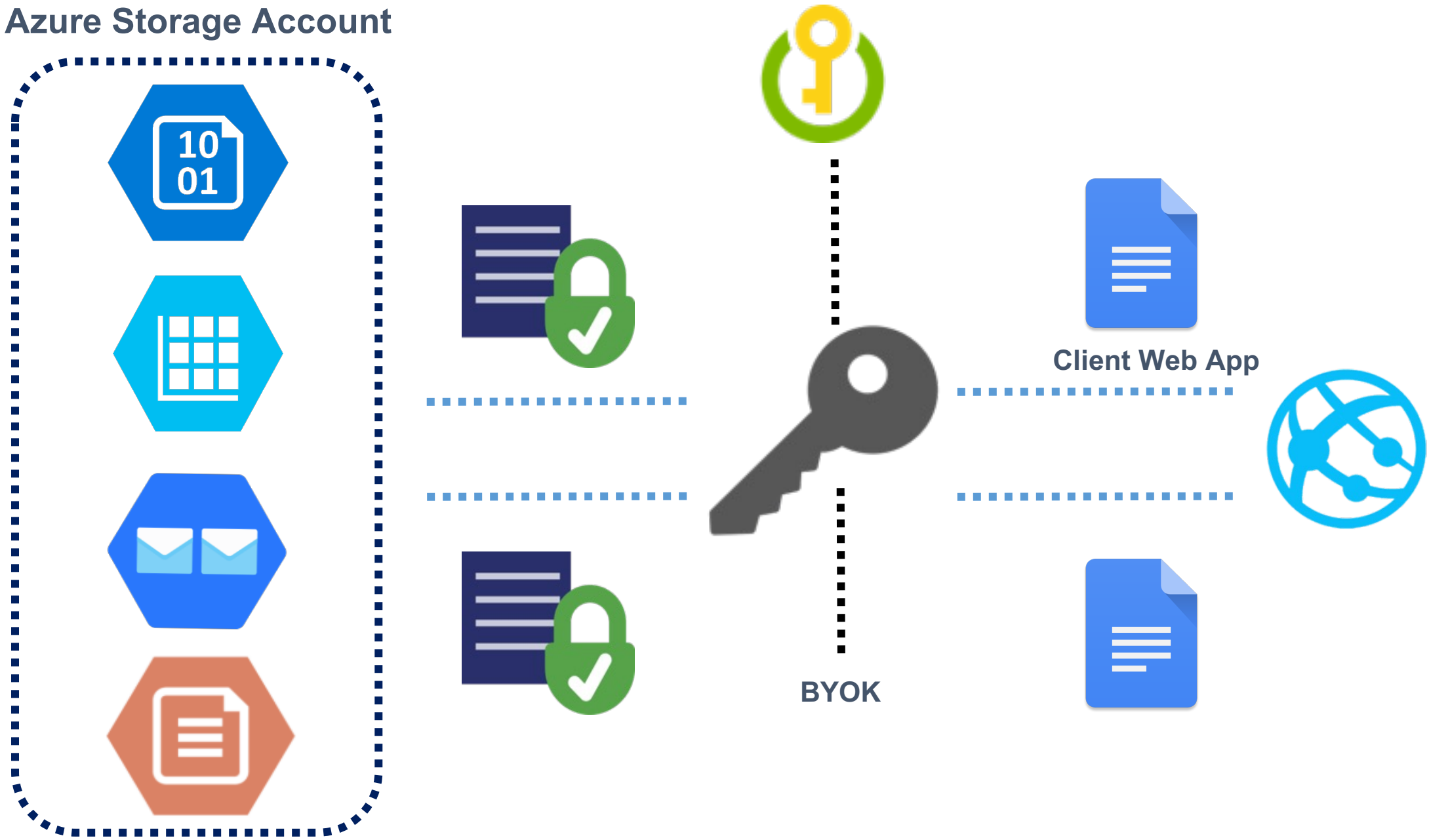
All data written to Azure Storage is automatically encrypted using Storage Service Encryption (SSE)

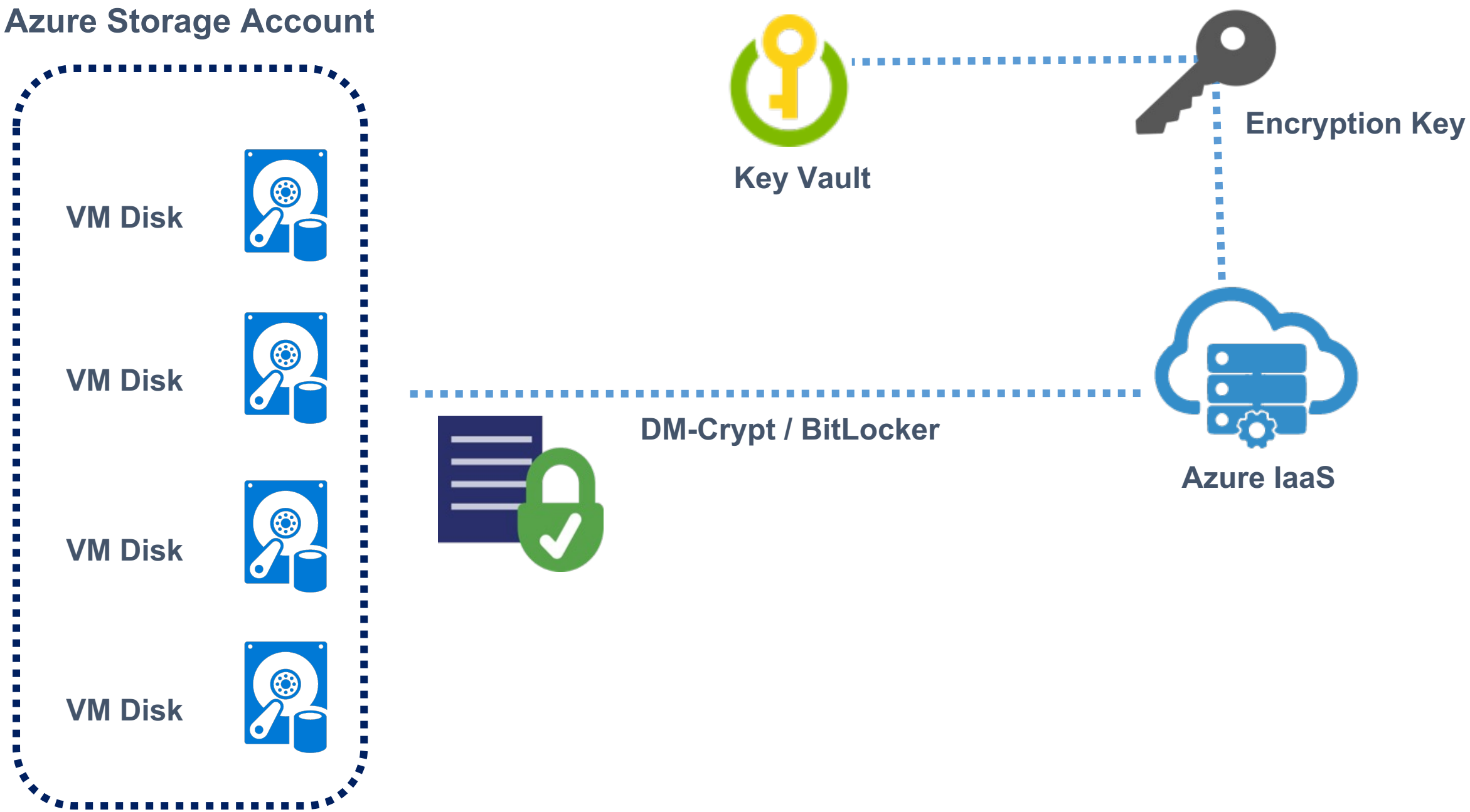
Role-Based Access Control (RBAC) support for Azure Storage

Data can be secured in transit between an application and Azure by using Client-Side Encryption, HTTPS.

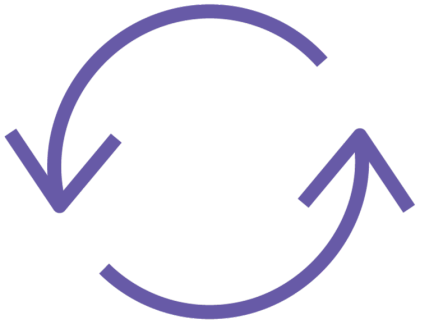
OS and data disks used by Azure virtual machines can be encrypted using Azure Disk Encryption.

Delegated access to the data objects in Azure Storage can be granted using Shared Access Signatures.


Azure Storage Account
10
01
Client Web App
BYOK


Azure Storage Account
VM Disk
VM Disk
VM Disk
VM Disk
Key Vault
Encryption Key
DM-Crypt / BitLocker
Azure IaaS

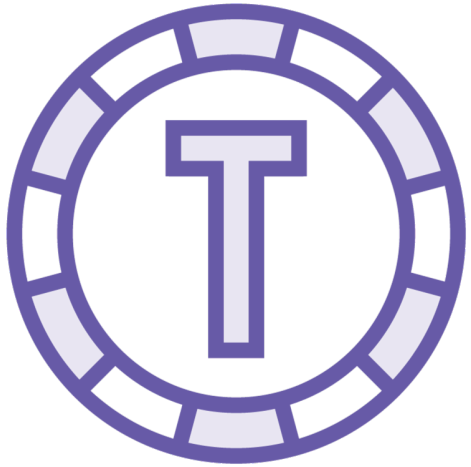
Regenerate Storage Account Keys



Update applications to use Key2
Regenerate Key1

Update applications to use Key1
Regenerate Key2

Shared Access Signature



"SAS" token

String credential
- Used as a Query string parameter - Pass to PowerShell, CLI, SDKs

Scope limited access to Storage Account
- To a specific service
- To a specific container
- To a specific resource, i.e. a blob

https://az303stgacct.blob.core.windows.net/container1?**sp=rwdl &st=2021-03-27T04:00:00Z&se=2021-03- 28T04:00:00Z&sip=168.1.5.60-168.1.5.70&spr=https&sv=2020-02- 10&sr=c&sig=Ks2W2PIRAp4L2E%2FPIHsnmrJ1ruL2HrM5SX6oifps GRw%3D**

Types of Shared Access Signatures

Develop Intelligence

Service Level SAS

Blob, File, Table or Queue service
Specific item / container

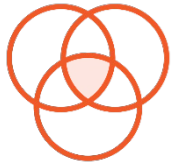
Account Level SAS

For multiple storage services
Greater management permissions

User Delegation SAS

Secured using Azure AD credentials
Blob service only

Stored Access Policies



Reuse permissions for multiple Shared Access Signatures

Revoke policy to invalidate linked Shared Access Signatures

For Service-level Shared Access Signatures

5

Maximum 5 Stored Access Policies per resource

Demo

Generate Shared Access Signature

Authenticate using SAS in the storage explorer

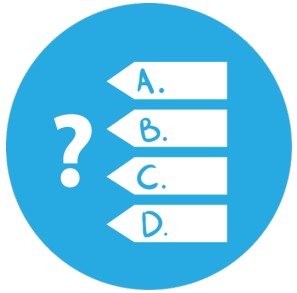
Assign stored access policies

Module Layout – Day 1

Develop Intelligence

What is Cloud Storage?	Azure Storage Services
Ensuring Business Continuity	Using Storage Services Programmatically
Azure Storage Security	Quiz

Quiz



1. Docker Desktop is an app for building and sharing containerized apps and microservices available on which of the following operating systems?

a. macOS only
b. Linux only
c. Windows, macOS, and Windows Subsystem for Linux (WSL)

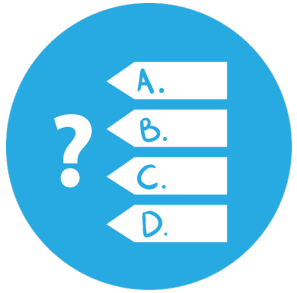
2. Which is correct Docker command to rebuild a container image?

a. docker rebuild
b. docker compile
c. docker build

3. Which of the following sentences describe a container image the best?

a. A container image is a read-only portable package that contains software and may include an operating system.
b. A container image is a set of commands that builds a container.
c. A container image is a read-only portable package that contains software.

Quiz



4. A container is launched using the --publish 8080:80 flag. Which of the following options is the most likely network configuration used for the container?

a. none
b. Bridge
c. Host

5. Suppose you work for a company that builds a Massively Multiplayer Online (MMO) game. You decide to move all your services to Azure Kubernetes service. Which of the following components will contribute to your monthly Azure charge?

a. The Master node
b. Per deployed Pod
c. Per node VM

6. Which of the following Kubernetes objects would you use to expose deployments

a. pods
b. service
c. Replica set

THANK YOU

Develop
Intelligence