AZ-104

Tag 3

Administer Azure Storage

Guten Morgen!

AZ-104 Course Outline

01: Administer Identity
02: Administer Governance and Compliance
03: Administer Azure Resources
04: Administer Virtual Networking
05: Administer Intersite Connectivity
06: Administer Network Traffic Management
07: Administer Azure Storage
08: Administer Azure Virtual Machines
09: Administer PaaS Compute Options
10: Administer Data Protection
11: Administer Monitoring

Learning Objectives - Administer Azure Storage

- Configure Storage Accounts
- Configure Blob Storage
- Configure Storage Security
- Configure Azure Files and File Sync
- Lab 07 – Manage Azure Storage

Configure Storage Accounts

Explore Azure Storage Services

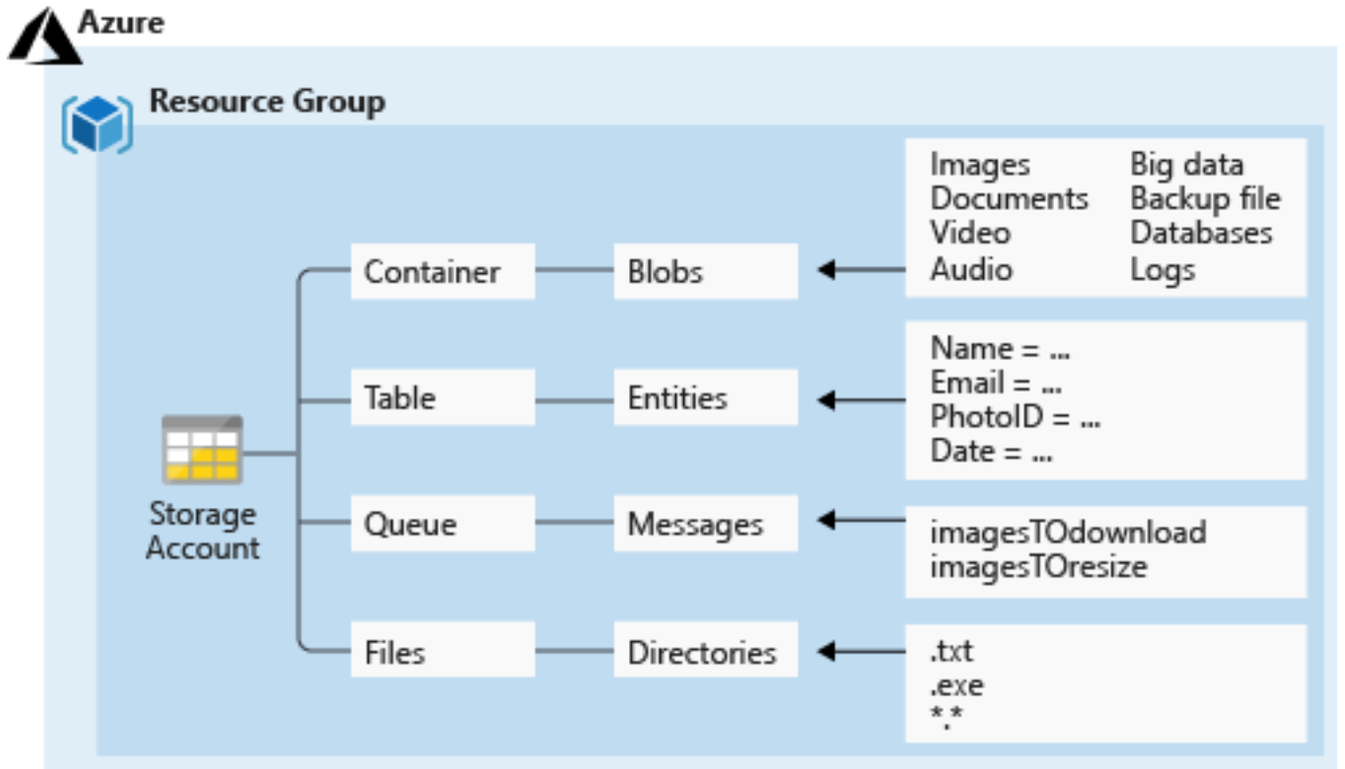
A service that you can use to store files, messages, tables, and other types of information

Azure Containers: A massively scalable object store for text and binary data

Azure Tables: Ideal for storing structured, non-relational data

Azure Queues: A messaging store for reliable messaging between application components

Azure Files: Managed file shares for cloud or on-premises deployments

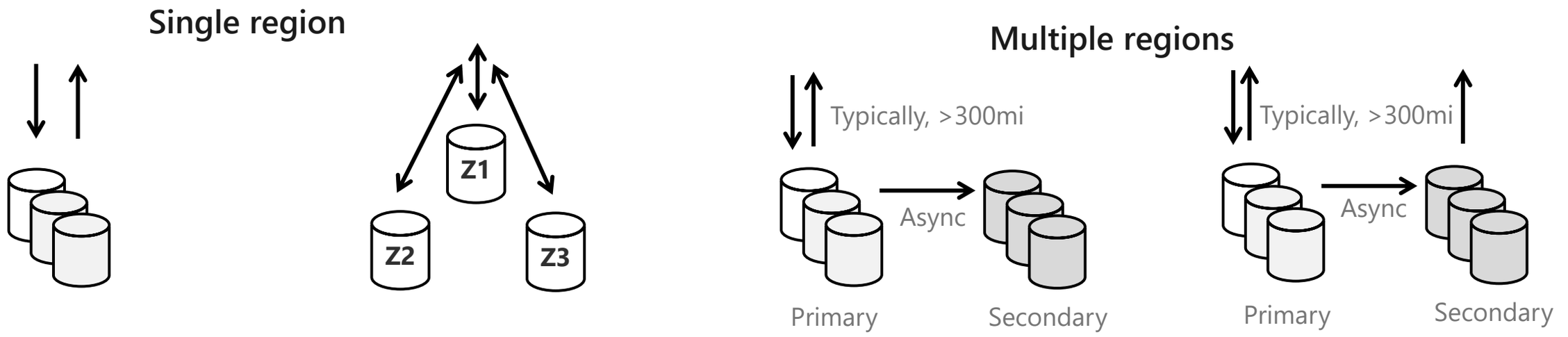


Determine Storage Account Kinds

All storage accounts are encrypted using Storage Service Encryption (SSE) for data at rest

Storage Account	Recommended usage
Standard general-purpose v2	Most scenarios including Blob, File, Queue, Table, and Data Lake Storage.
Premium block blobs	Block blob scenarios with high transactions rates, or scenarios that use smaller objects or require consistently low storage latency.
Premium file shares	Enterprise or high-performance file share applications.
Premium page blobs	Premium high-performance page blob scenarios.

Determine Replication Strategies (1 of 2)



LRS

- Three replicas, one region
- Protects against disk, node, rack failures
- Write is acknowledged when all replicas are committed
- Superior to dual-parity RAID

ZRS

- Three replicas, three zones, one region
- Protects against disk, node, rack, and zone failures
- Synchronous writes to all three zones

GRS

- Six replicas, two regions (three per region)
- Protects against major regional disasters
- Asynchronous copy to secondary

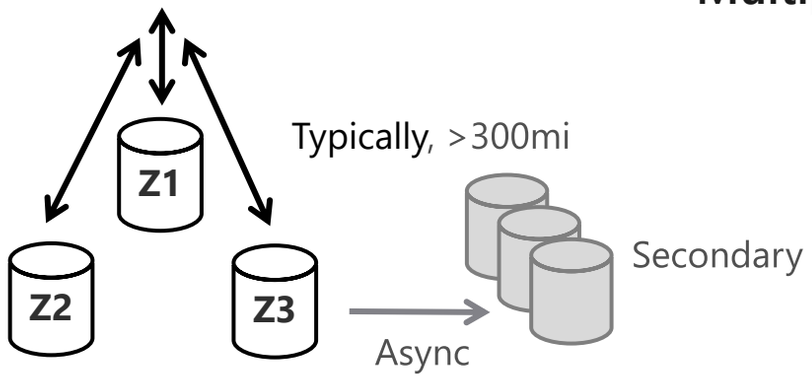
RA-GRS

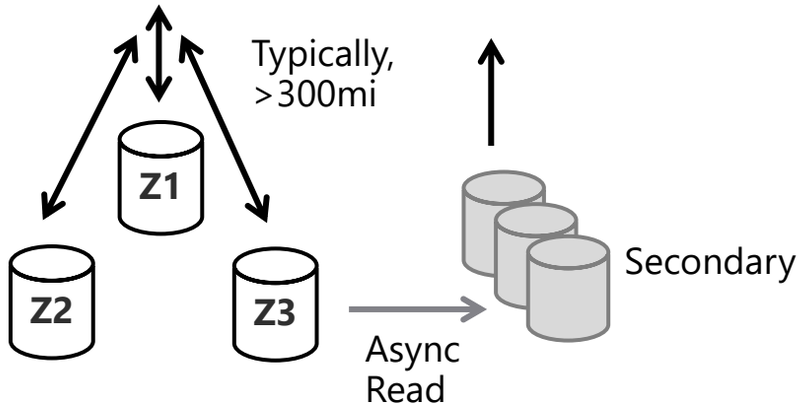
- GRS + read access to secondary
- Separate secondary endpoint
- Recovery point objective (RPO) delay to secondary can be queried

Continued next slide

Determine Replication Strategies (2 of 2)

Multiple regions





GZRS

- Six replicas, 3+1 zones, two regions
- Protects against disk, node, rack, zone, and region failures
- Synchronous writes to all three zones and asynchronous copy to secondary

RA-GZRS

- GZRS + read access to secondary
- Separate secondary endpoint
- RPO delay to secondary can be queried

Access Storage

Every object has a unique URL address – based on account name and storage type

Container service: https://*mystorageaccount*.blob.core.windows.net
Table service: https://*mystorageaccount*.table.core.windows.net
Queue service: https://*mystorageaccount*.queue.core.windows.net
File service: https://*mystorageaccount*.file.core.windows.net

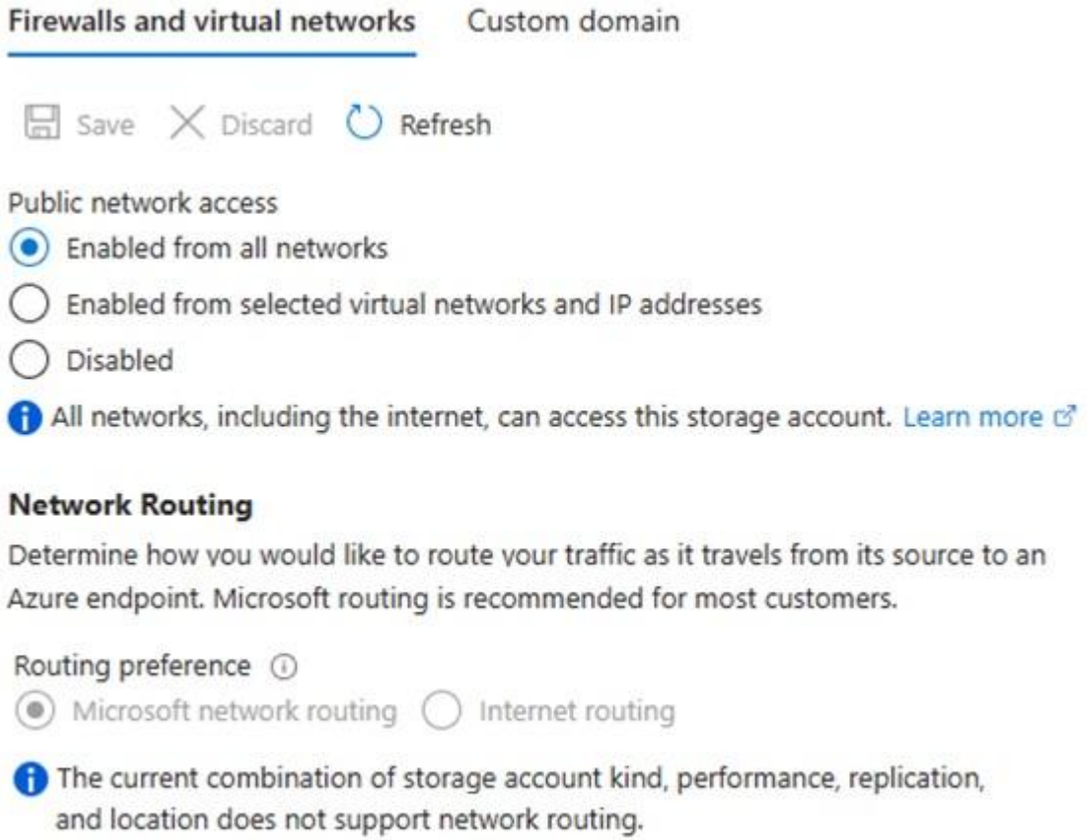
- If you prefer you can configure a custom domain name

CNAME record	Target
blobs.contoso.com	contosoblobs.blob.core.windows.net

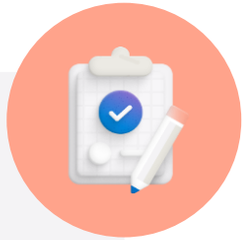
Secure Storage Endpoints

Firewalls and Virtual Networks restrict access to the Storage Account from specific Subnets on Virtual Networks or public IP’s

Subnets and Virtual Networks must exist in the same Azure Region or Region Pair as the Storage Account



Learning Recap – Configure Storage Accounts



- Create an Azure Storage account
- Provide disaster recovery by replicating storage data across regions and failing over to a secondary location

Check your knowledge questions and additional study

Configure Blob Storage

Implement Blob Storage

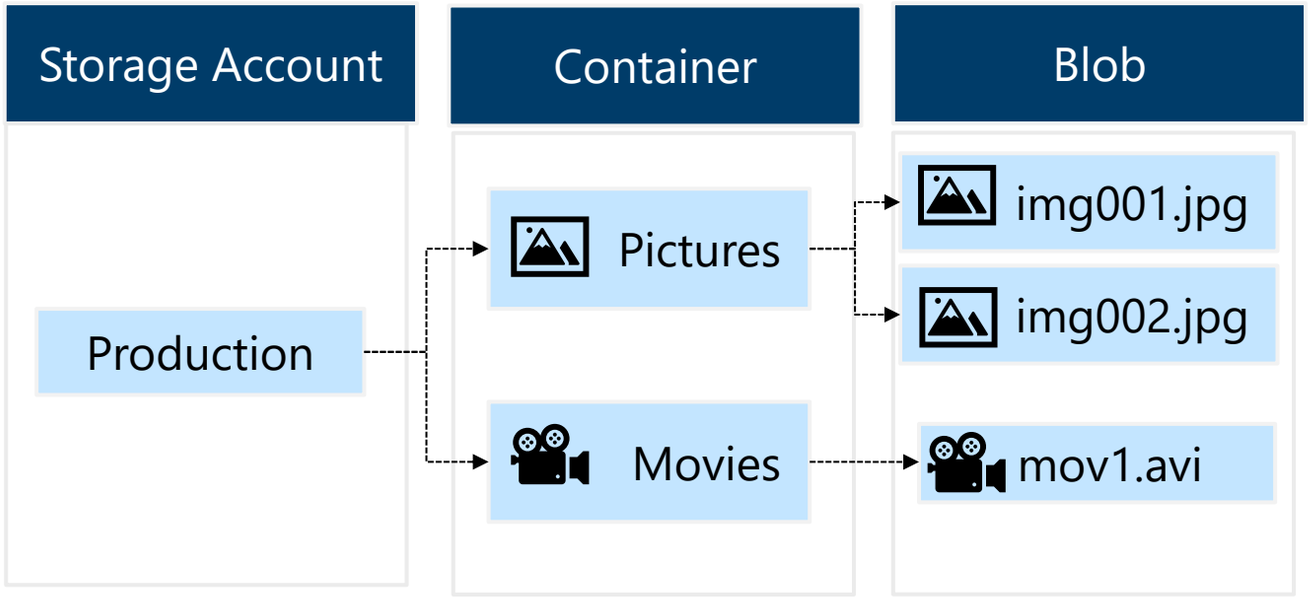
Stores unstructured data in the cloud

Can store any type of text or binary data

Also referred to as *object storage*

Common uses:

- 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, archiving
- Storing data for analysis by an on-premises or Azure-hosted service



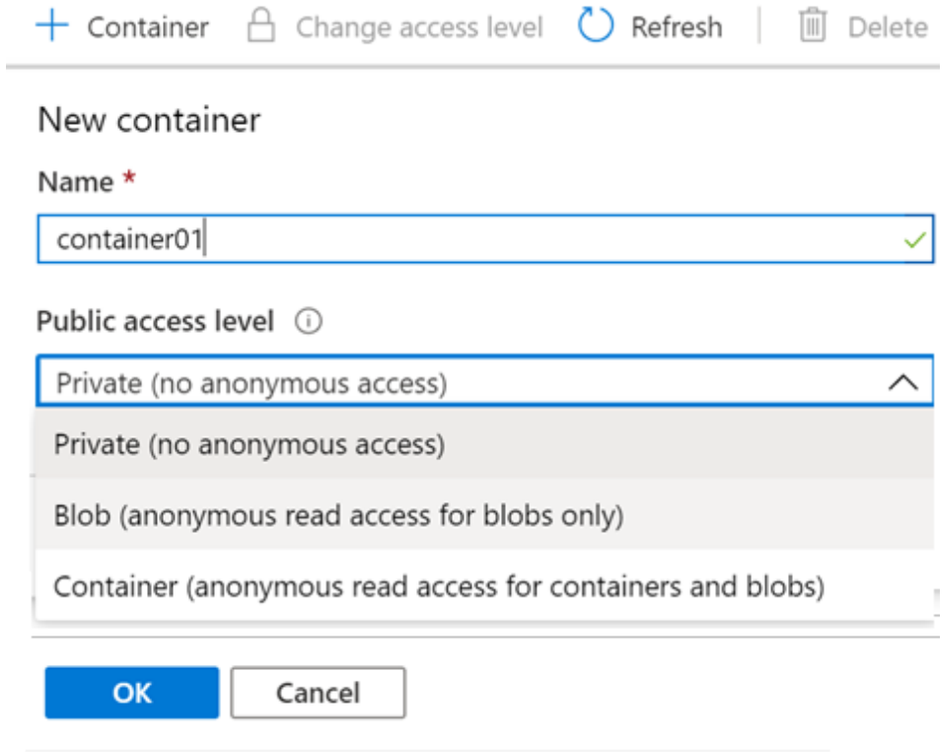
Create Blob Containers

All blobs must be in a container

Accounts have unlimited containers

Containers can have unlimited blobs

Restrict access using the public access level



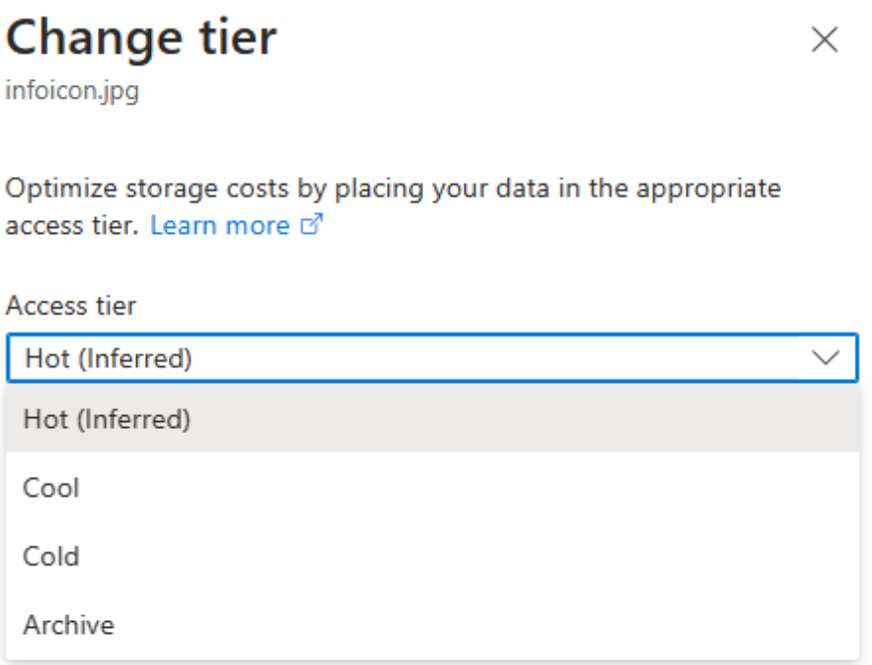
Create Blob Access Tiers

Hot tier – Data that is accessed or modified frequently

Cool tier – Data that is infrequently accessed or modified and stored for at least 30 days

Cold tier – Data that is infrequently accessed or modified and stored for at least 90 days

Archive – Data that can tolerate several hours of retrieval latency and will remain in the Archive tier for at least 180 days

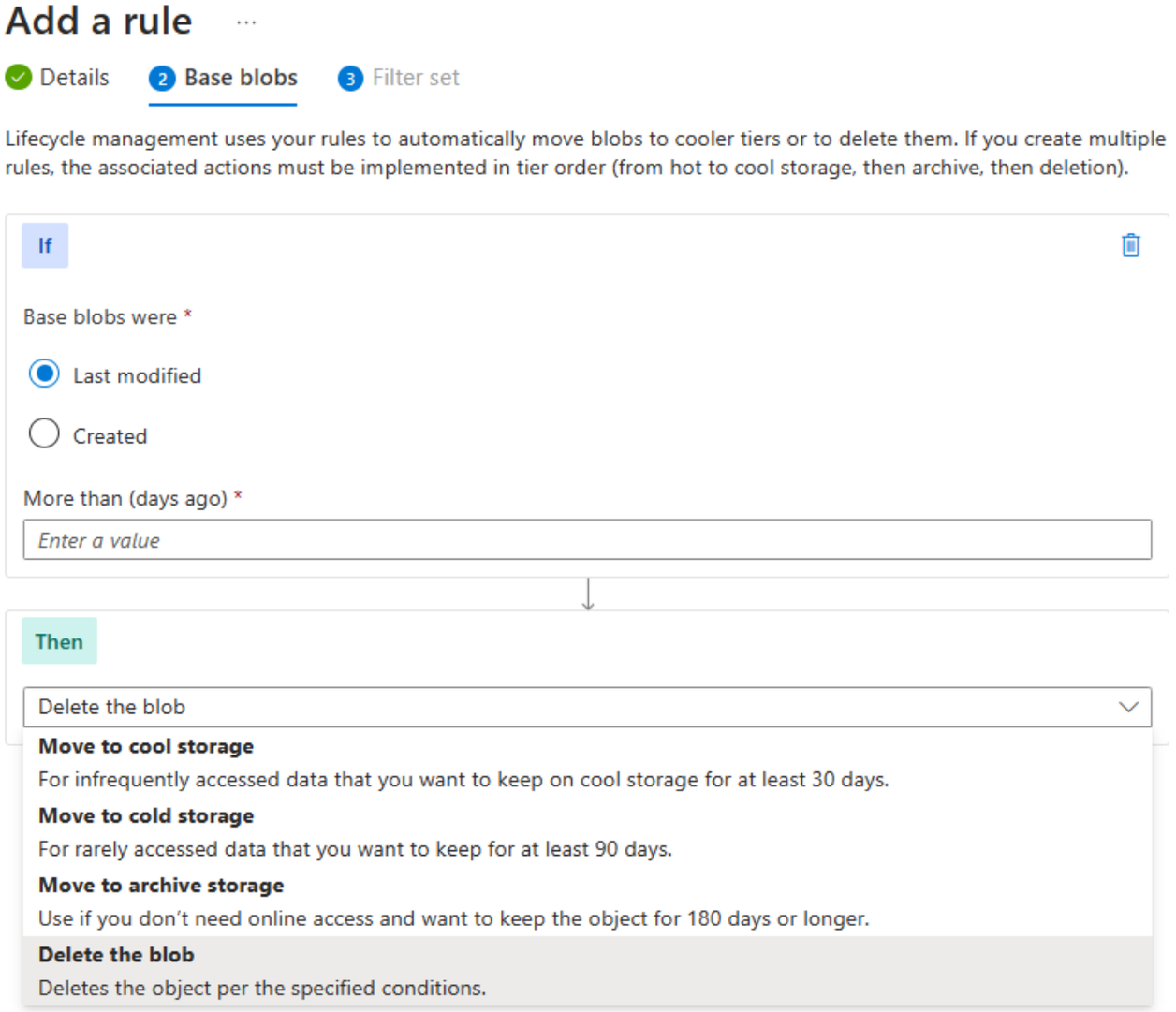


Add Blob Lifecycle Management Rules

Transitioning of blobs to a cooler storage tier to optimize for performance and cost

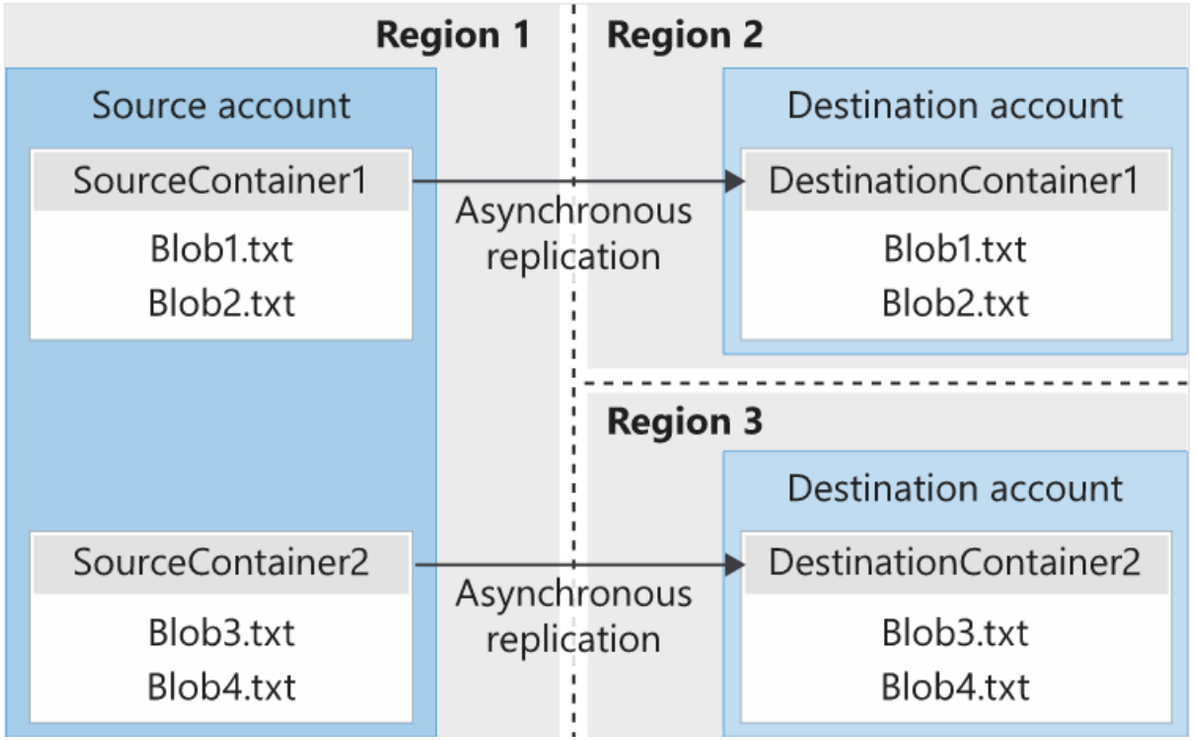
Delete blobs at the end of their lifecycle

Apply rules to filtered paths in the Storage Account

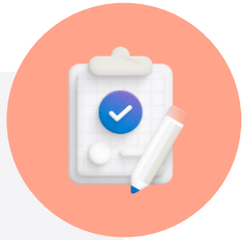


Determine Blob Object Replication

- Asynchronous to any other Region
- Minimizes latency for read requests
- Increases efficiency for compute workloads
- Optimizes data distribution
- Optimizes costs



Learning Recap - Configure Blob Storage



- Optimize storage performance and costs using Azure Blob storage tiers
- Gather metrics from your Azure Blob Storage containers

Check your knowledge questions and additional study

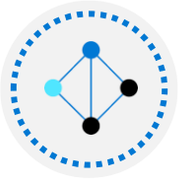
Configure Storage Security

Review Storage Security Strategies

Storage Service Encryption

Shared Access Signatures – delegated access

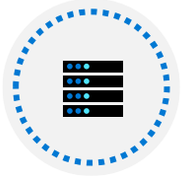
Authentication with Entra ID and RBAC



Shared Key – encrypted signature string

Client-side encryption, HTTPS, and SMB 3.0 for data in transit

Anonymous access to containers and blobs



Azure disk encryption

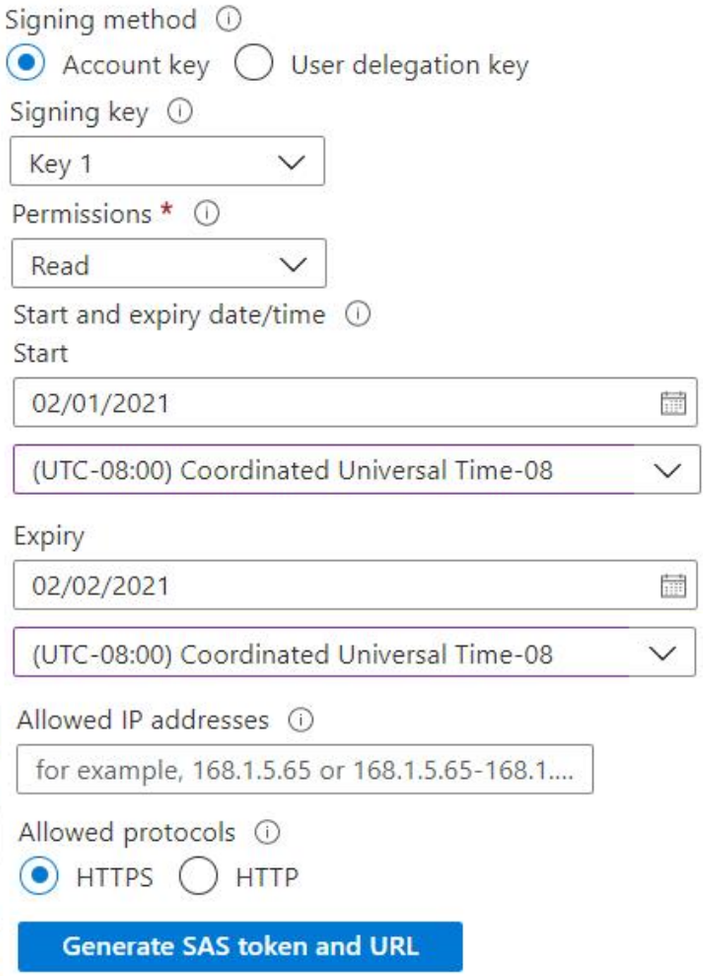
Create Shared Access Signatures

Provides delegated access to resources

Grants access to clients without sharing your storage account keys

The account SAS delegates access to resources in one or more of the storage services

The service SAS delegates access to a resource in just one of the storage services



Identify URI and SAS Parameters

- A SAS is a signed URI that points to one or more storage resources
- Consists of a storage resource URI and the SAS token


```
https://myaccount.blob.core.windows.net/?sp=r&st=2020-05-
11T18:31:43Z&se=2020-05-12T02:31:43Z&spr=https&sv=2019-10-
10&sr=b&sig=jOqABJZHfUVeBQ3yVn7kWiCKlO0sxCiK1rzEchfAz8U%3D
```

Includes parameters for resource URI, storage services version, services, resource types, start time, expiry time, resource, permissions, IP range, protocol, signature

Determine Storage Service Encryption

You can use your own key (next topic)

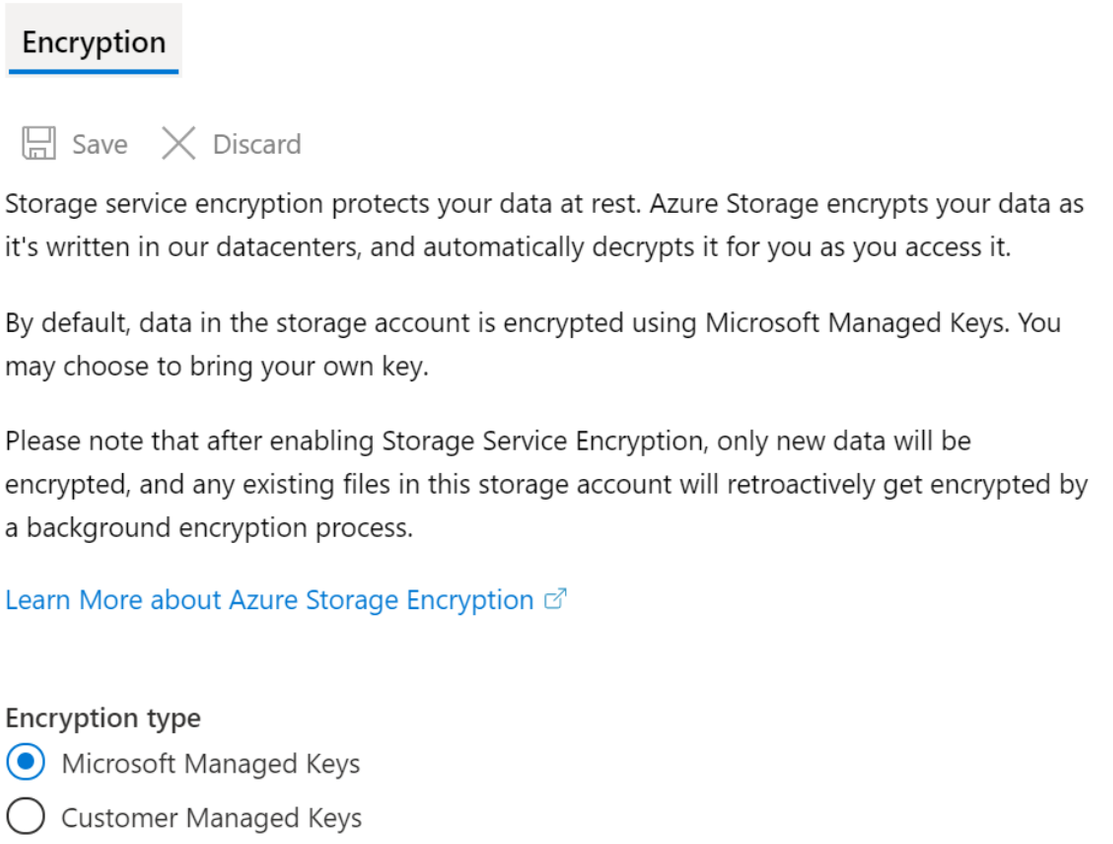
Protects your data for security and compliance

Automatically encrypts and decrypts your data

Encrypted through 256-bit AES encryption

Is enabled for all new and existing storage accounts and cannot be disabled

Is transparent to users



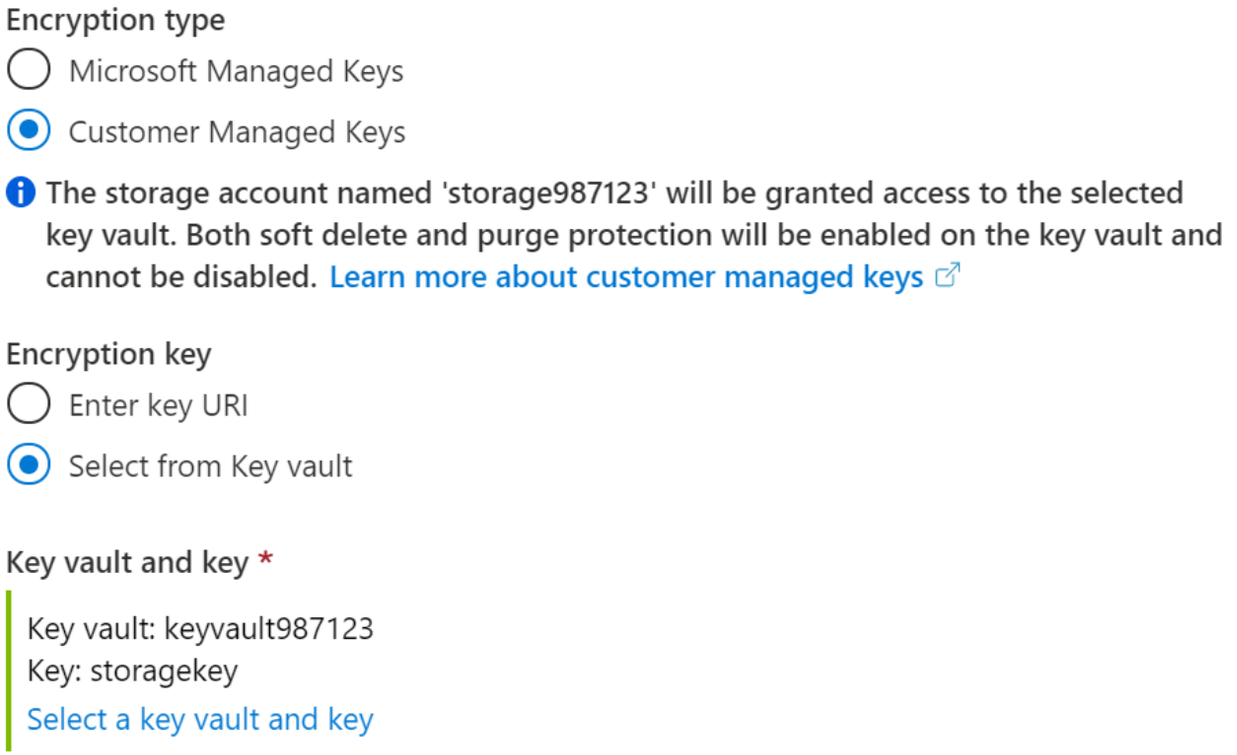
Create Customer Managed Keys

Use the Azure Key Vault to manage your encryption keys

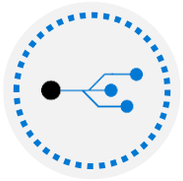
Create your own encryption keys and store them in a key vault

Use Azure Key Vault's APIs to generate encryption keys

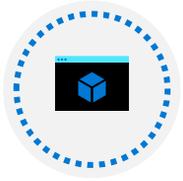
Custom keys give you more flexibility and control



Apply Storage Security Best Practices



Always use HTTPS to create or distribute a SAS

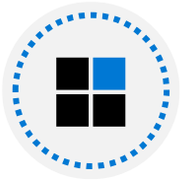


Reference stored access policies where possible

Use near-term expiration times on an ad hoc SAS

Use Storage Analytics to monitor your application

Be careful with SAS start time



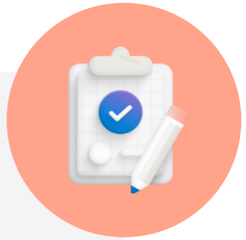
Be specific with the resource to be accessed

Understand that your account will be billed for any usage

Validate data written using SAS

Don't assume SAS is always the correct choice

Learning Recap - Configure Storage Security



- Secure your Azure Storage account
- Control access to Azure Storage with shared access signatures

Check your knowledge questions and additional study

Configure Azure Files and File Sync

Compare storage for file shares and blob data

Feature	Description	When to use
Azure Files	SMB interface, client libraries, and a REST interface that allows access from anywhere to stored files	• Lift and shift an application to the cloud • Store shared data across multiple virtual machines • Store development and debugging tools that need to be accessed from many virtual machines
Azure Blobs	Client libraries and a REST interface that allows unstructured data (flat namespace) to be stored and accessed at a massive scale in block blobs	• Support streaming and random-access scenarios • Access application data from anywhere

Manage File Shares

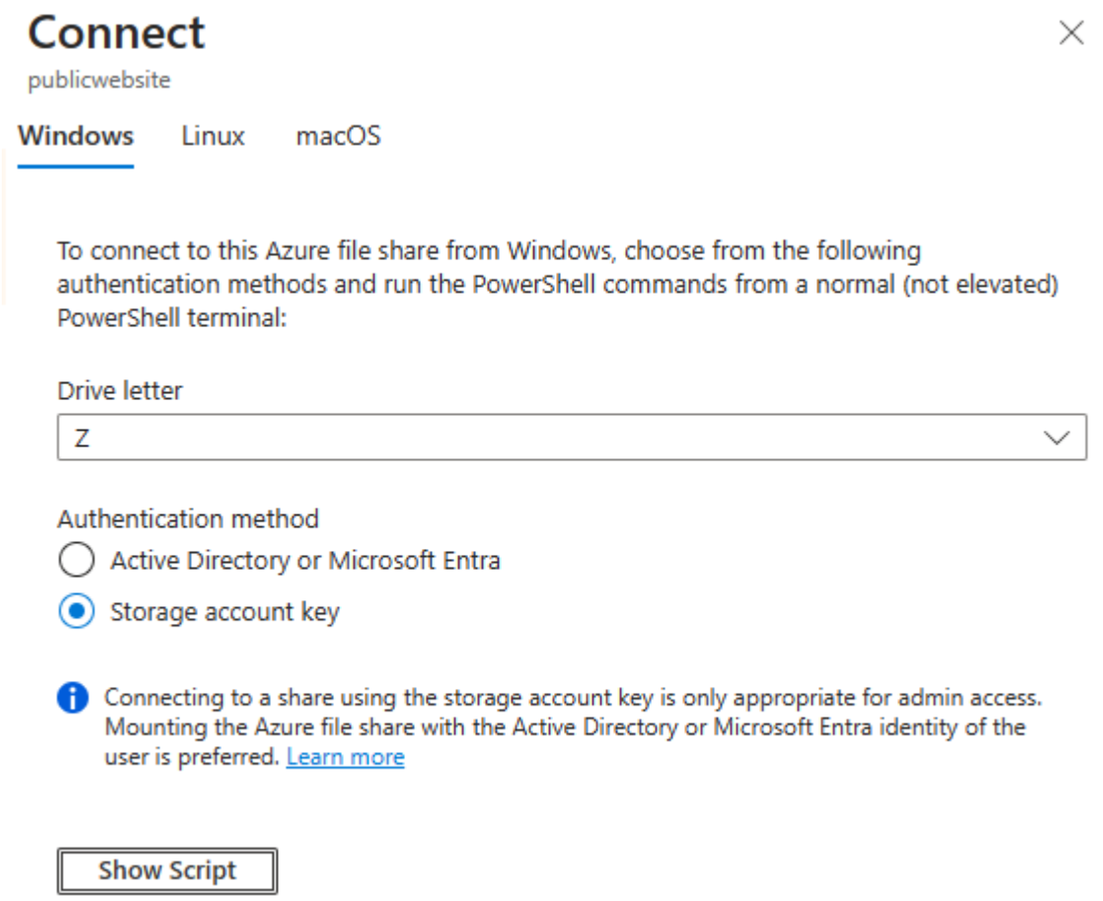
File share quotas

Windows – ensure port 445 is open

Linux – mount the drive

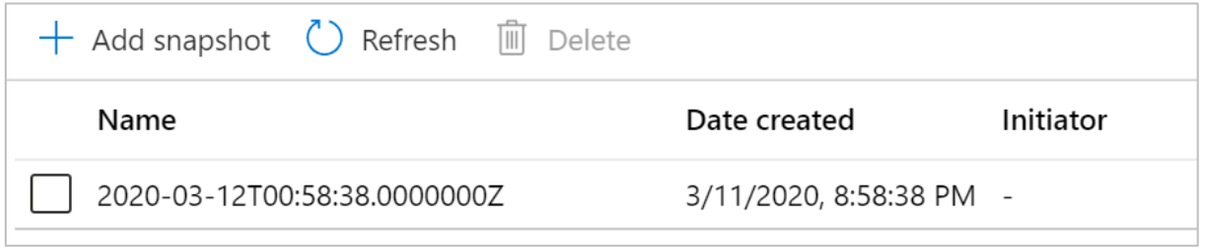
MacOS – mount the drive

Secure transfer required – SMB 3.0 encryption



Create File Share Snapshots

- Protection against application error and data corruption
- Protection against accidental deletions or unintended changes
- Support backup and recovery

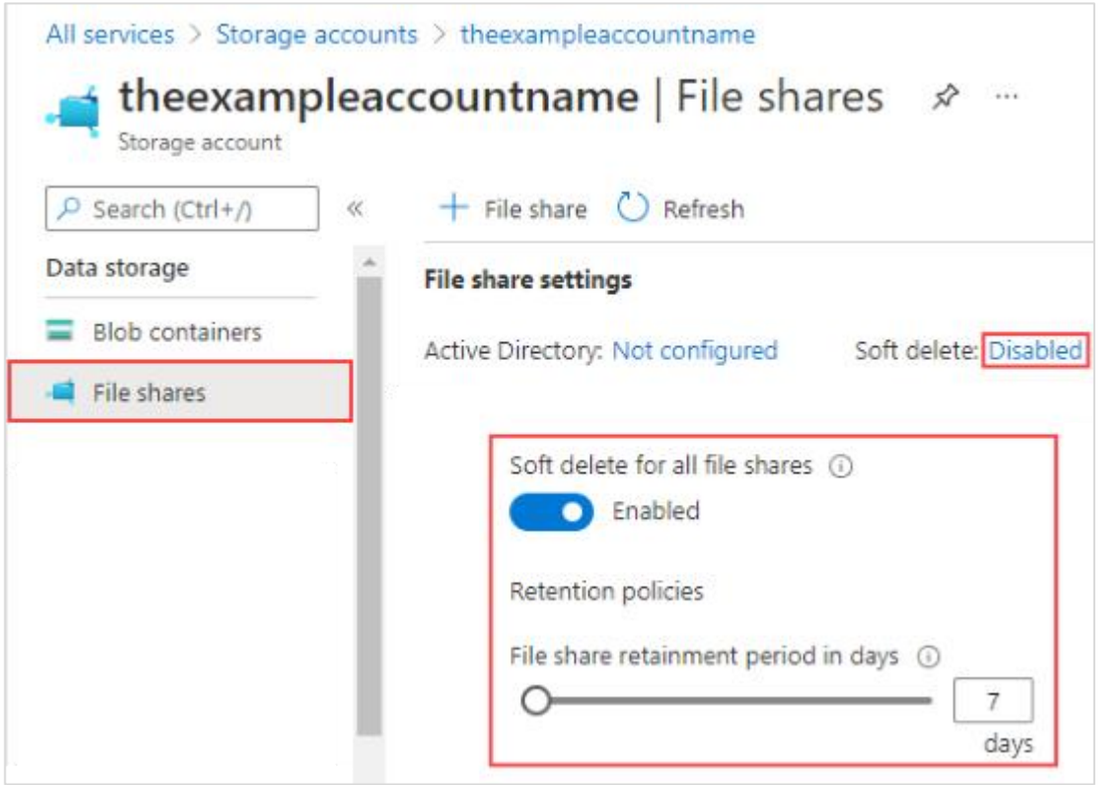


- Incremental snapshot that captures the share state at a point in time
- Snapshot at the *file share level*, and restore at the *file level*
- Is read-only copy of your data

Implement soft delete for Azure Files

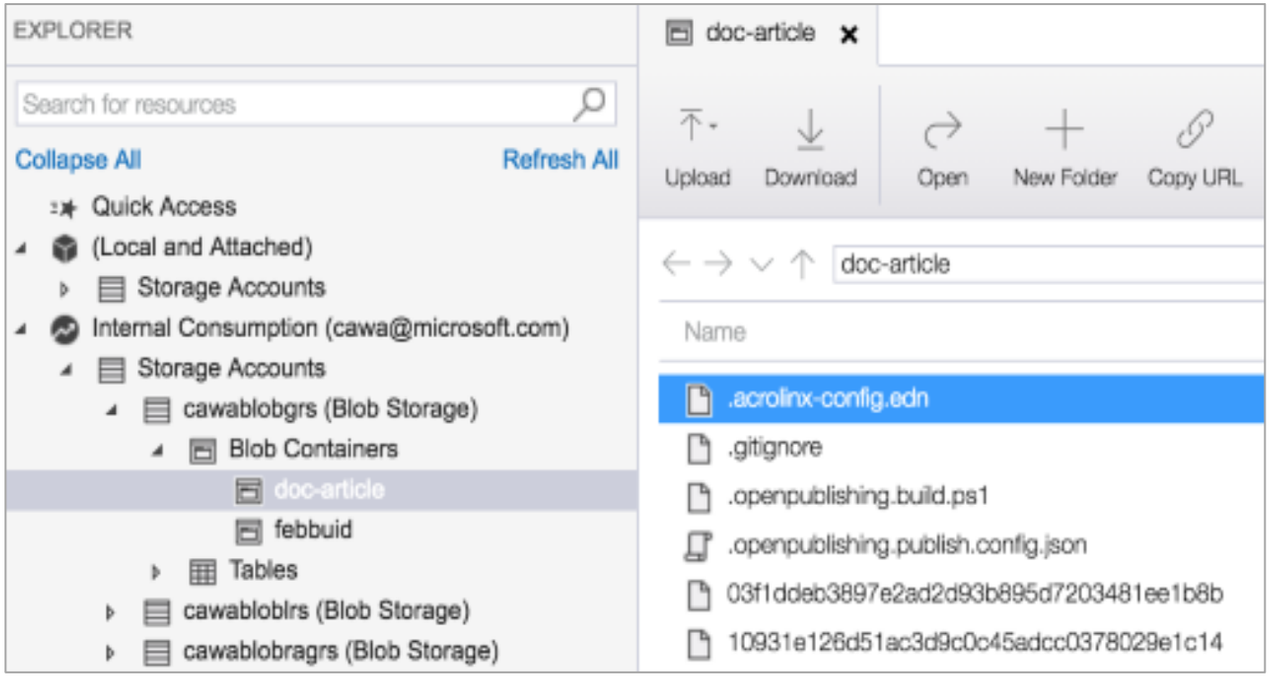
- Recovery from accidental data loss
- Major change or upgrade scenarios
- Business continuity – ransomware situations
- Data compliance retention

- Enabled at the storage account level
- Transitions content to a soft deleted state
- Provides a retention period of 1 and 365 days
- Works on new or existing file shares
- Doesn't work for NFS shares



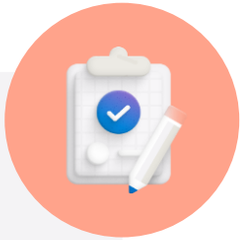
Use Azure Storage Explorer

- Download and install
- Access multiple accounts and subscriptions
- Create, delete, view, edit storage resources
- View and edit Blob, Queue, Table, File, Cosmos DB storage and Data Lake Storage
- Obtain shared access signature (SAS) keys
- Available for Windows, Mac, and Linux



Also consider portal-based Azure Storage Browser and Azure Storage Mover

Learning Recap - Configure Azure Files and File Sync



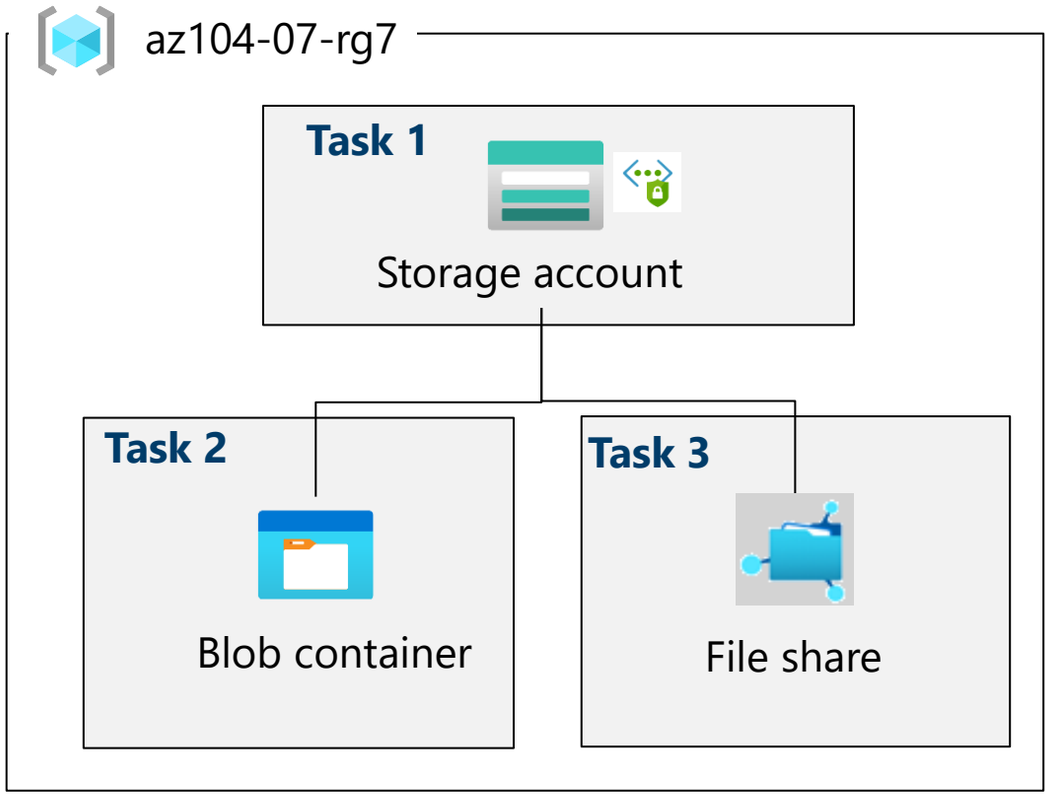
Check your knowledge questions and additional study

Reference Learn modules

- Configure Azure Files and Azure File Sync
- Implement a hybrid file server infrastructure
- Upload, download, and manage data with Azure Storage Explorer
- Copy and move blobs from one container or storage account to another using the AzCopy command

Lab – Manage Azure Storage

Lab 07 – Architecture diagram



End of presentation