Microsoft

AZ-305

Tag 2

Designing Microsoft
Azure Infrastructure
Architect

Guten Morgen!

AZ-305 Agenda

Module 01 Design a governance solution

Module 02 Design a compute solution

Module 03 Design a non-relational data storage solution ← KQL

Module 04 Design a data storage solution for relational data

Module 05 Design a data integration solution Data Lake

Log Analytics WS

Module 06 Design an application architecture solution

Module 07 Design Authentication and Authorization Solutions

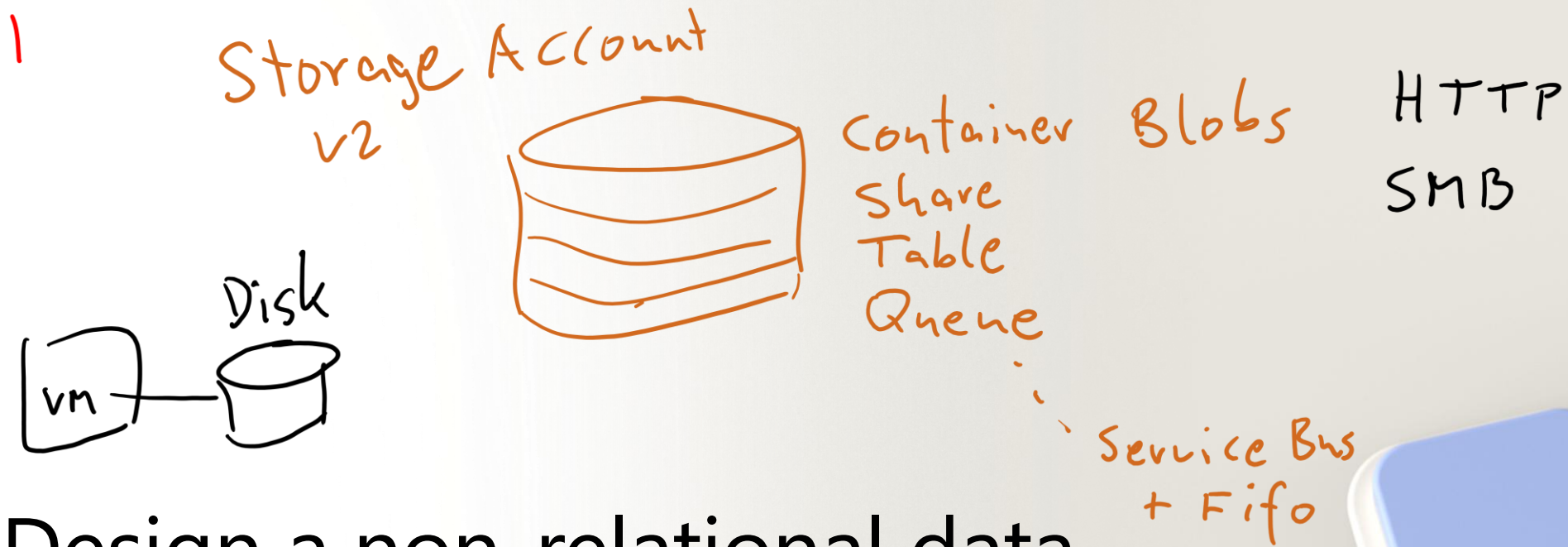Module 08 Design a solution to log and monitor Azure resources

Module 09 Design a network infrastructure solution

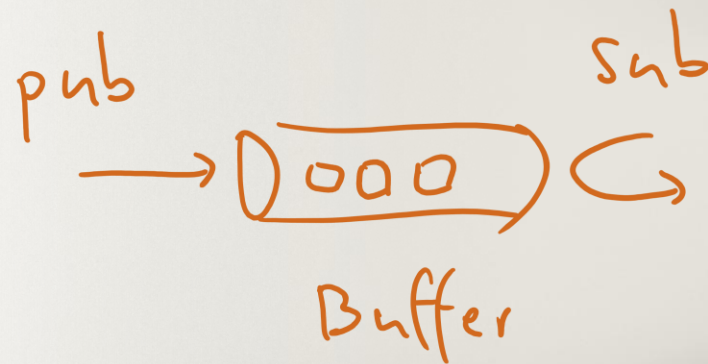Module 10 Design a business continuity solution

Module 11 Design a migration solution

Skillable
180 Tage
3 x

IaaS
PaaS
(SaaS) M1

Design a non-relational data storage solution

Learning Objectives

- Design for data storage

- Design for Azure storage accounts

- Design for data redundancy

- Design for Azure blob storage

- Design for Azure files

- Design an Azure disk solutions

- Design for storage security

- Case study

- Learning recap

App △ Entra ID

OAuth 2.0

AZ-305: Design Data Storage Solutions (20-25%)

Design data storage solutions for semi-structured and unstructured data

- Recommend a solution for storing semi-structured data
- Recommend a solution for storing unstructured data
- Recommend a data storage solution to balance features, performance, and costs
- Recommend a data solution for protection and durability

Design for data storage

Classify your data storage

SQL

Structured	Semi-structured	Unstructured
	XML JSON YAML	
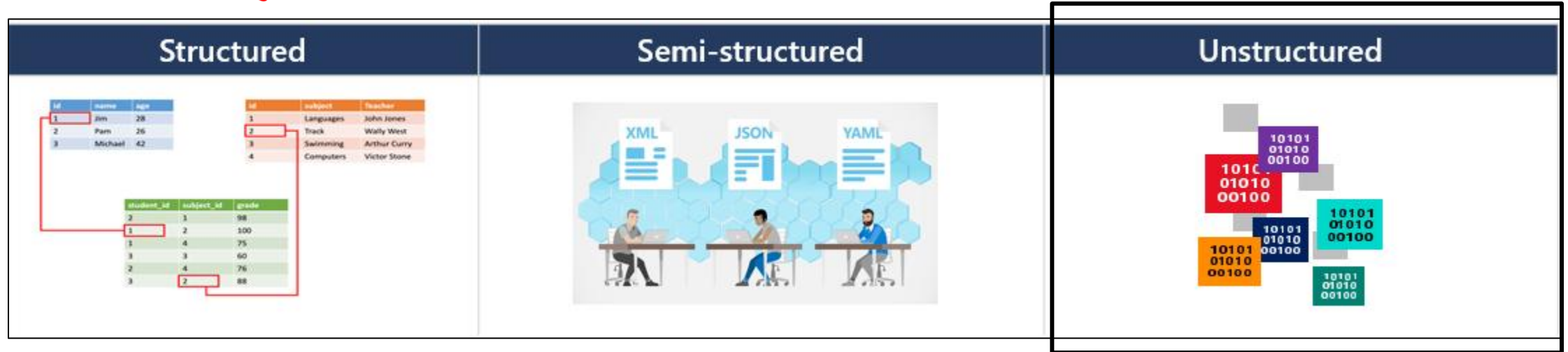
To design Azure storage, you first must determine what type of data you have.

- **Structured data** includes relational data and has a shared schema
- **Semi-structured** is less organized than structured data and isn't stored in a relational format
- **Unstructured data** is the least organized type of data

Design for Azure storage accounts

Determine the best storage account type

Select an account type based on supported services, usage cases, and SLA.

HDD

Account Type	Supported services	Usage
Standard general-purpose v2 (default)	Blobs / Data Lake, Queues, Tables, Azure Files	Recommended for most scenarios *Klass. ✓*
Premium block blobs *SSD*	Blob storage, Data Lake	High transactions rates, single digit storage latency, or large numbers of small transactions
Premium file shares	Azure Files	Enterprise or high-performance scale applications - supports both SMB and NFS file shares
Premium page blobs	Page blobs only	High performance and low latency storage scenarios

Ultra

Considerations for storage accounts

It is important to plan your storage accounts.

GRS Avail Zone

+ Read Access

GZRS-RA

GRS

Peer Region

LRS **Region**

Location
For performance reasons locate the data close to users. One storage account for each location.

Replication
Data storage could have different replication strategies.

Compliance
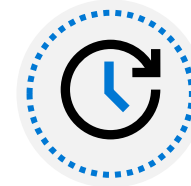Regulatory guidelines for keeping data in a specific location / Internal requirements for auditing or storing data.

Administrative overhead **API SDK**
Each storage account requires some time and attention from an administrator to create and maintain.

Cost
The settings for the account do influence the cost of services in the account.

Security - Data sensitivity
Data plane security and data storage security.

Design for data redundancy

Select a storage replication strategy

What level of redundancy do you need?

Primary Region

Locally redundant storage

Zone redundant storage

Secondary Region

Geo- redundant storage

Geo-zone redundant storage

Read and write access to the secondary region are available if the primary region becomes unavailable
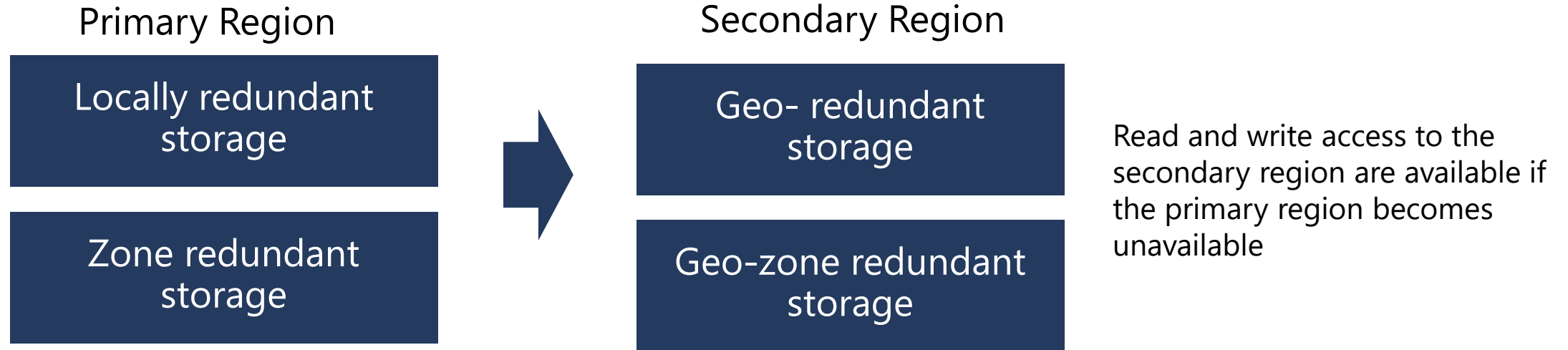
- A node within a data center becomes unavailable

- An entire data center (zonal or non-zonal) becomes unavailable

- A region-wide outage occurs in the primary region

Design for Azure blob storage

Binary Large Object

Determine the storage tier

Blob storage is an object store used for storing vast amounts of unstructured data.
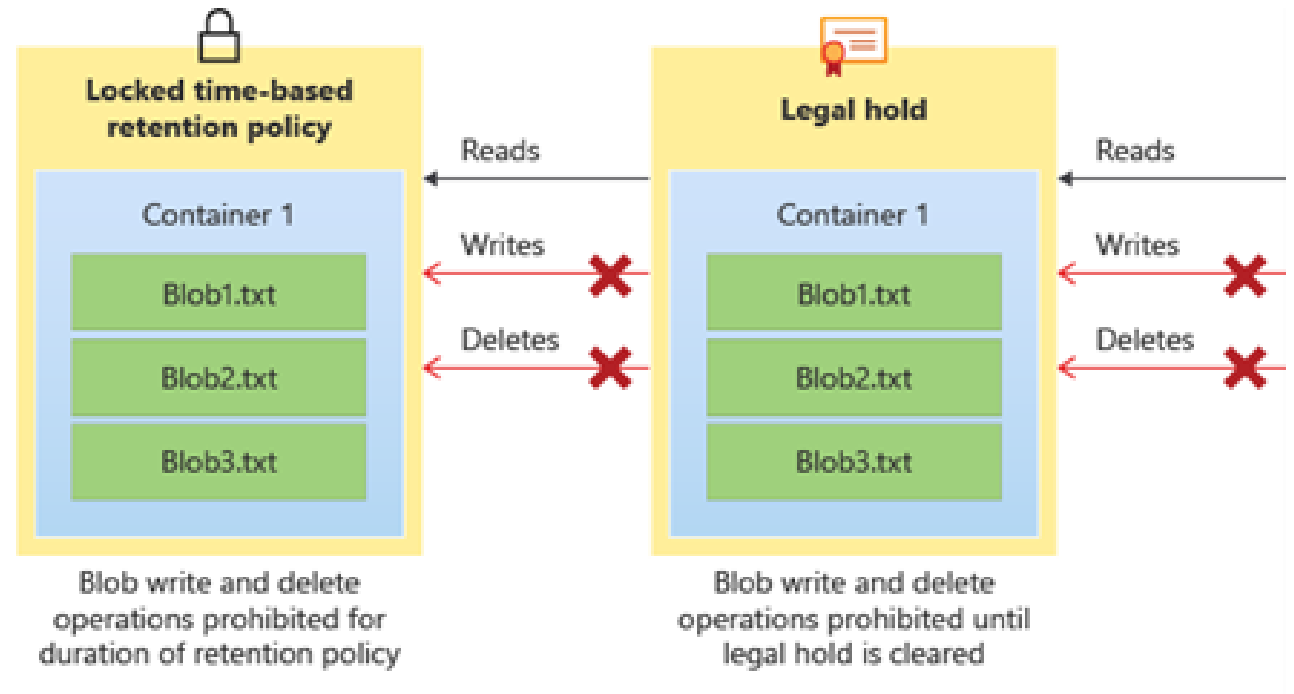
Tier	Storage Duration	Usage cases
Premium	N/A	• High throughout and large numbers of I/O operations per second
Standard Hot	N/A	• Active and frequent use • Data staged for processing
Standard Cool	> 30 days	• Short-term backup
Standard Cold	> 90 days	• Older media infrequently viewed • Large data sets
Standard Archive *(Tapes)*	> 180 days	• Long-term backup • Original (raw) data • Compliance or archival data

• Use lifecycle rules to manage the storage tiers

Consider immutable storage policies

Determine regulatory compliance, secure document retention, and legal hold policies.

- Apply immutable storage policies at the container level

- Use **time-based retention policies** for business-critical data

- Use **legal-hold policies** for sensitive information to ensure a tamper proof state

- Policies apply only to new content

- Audit logs are available

Locked time-based retention policy
Container 1
Blob1.txt
Blob2.txt
Blob3.txt
Reads
Writes
Deletes
Blob write and delete operations prohibited for duration of retention policy

Legal hold
Container 1
Blob1.txt
Blob2.txt
Blob3.txt
Reads
Writes
Deletes
Blob write and delete operations prohibited until legal hold is cleared

Design for Azure files

Compare Azure files to Azure blobs

The technology you choose depends on the use case, protocol, and performance.

Category	Azure Files	Azure Blob Storage
Use cases	• Replace or supplement traditional on-premises file servers or NAS devices • Access files shares from anywhere • Lift and shift content to the cloud • Replicate and cache with Azure File Sync • Share stored application settings	• Large scale analytical data • Throughput sensitive high-performance computing • Backup and archive • Autonomous driving, media rendering, or genomic sequencing data
Available protocols	• SMB • REST • NFS 4.1	• NFS 3.0 • REST • Data Lake Storage Gen2
Performance (Per volume)	• Better IOPS	• Better throughput

Select a file storage tier (activity)

Tailor your file tiers to the performance and price you need
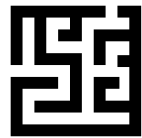
File storage tiers
Premium
Transaction optimized
Hot
Cool

You have highly I/O-intensive workloads, with high throughput and low latency

You need storage optimized for general purpose file sharing scenarios such as team shares and Azure File Sync

You need cost-efficient storage optimized for online archive storage scenarios

You have transaction heavy workloads and applications that require file storage and backend storage

Design for NetApp files

The Azure NetApp Files service is enterprise-class, high-performance, metered file storage.

- Ease of migration

- Workload scale

- Flexibility

- Storage technology

Migration (Windows Apps & SQL Server | Linux OSS Apps & Databases | SAP on Azure)
Specialized workloads (HPC | VDI | AVS)
Azure Platform Services (AKS, Azure Batch, …)
Azure NetApp Files (Enterprise NAS)

Design an Azure disk solution

Select an Azure disk solution

vn

Azure disks are block-level storage volumes used with Azure virtual machines.

- Consider disk type, scenario, throughput, and IOPS

- Always use managed disks

- Optimize read and write access with disk caching

- Use Azure Disk Encryption

- Enhance performance with multiple disks

- Use the network acceleration feature
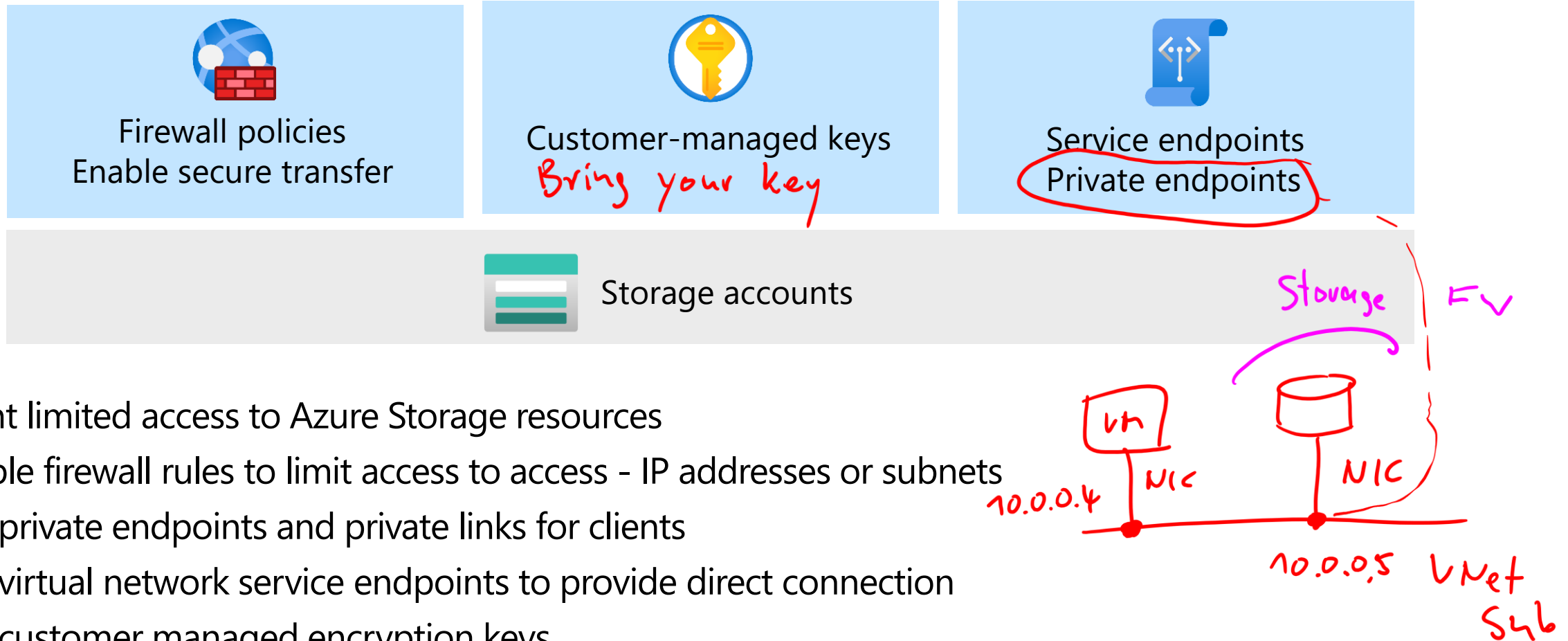
- Share disks across multiple VMs

Disk type	Usage cases
Ultra-disk SSD	IO-intensive workloads such as SAP HANA, top tier databases (SQL, Oracle), and other transaction-heavy workloads
Premium SSD v2	Production and performance-sensitive workloads that consistently require low latency and high IOPS and throughput
Premium SSD	Production and performance sensitive workloads
Standard SSD	Web servers, lightly used enterprise applications and dev/test
Standard HDD	Backup, non-critical, infrequent access

Design for storage security

Considerations for storage security

Use a layered security model to secure and control access.

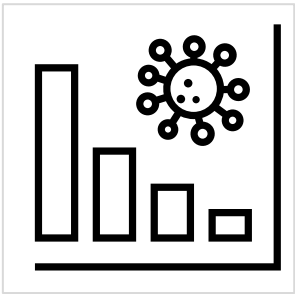| Firewall policies Enable secure transfer	Customer-managed keys *Bring your key*	Service endpoints Private endpoints

Storage accounts

- Grant limited access to Azure Storage resources
- Enable firewall rules to limit access to access - IP addresses or subnets
- Use private endpoints and private links for clients
- Use virtual network service endpoints to provide direct connection
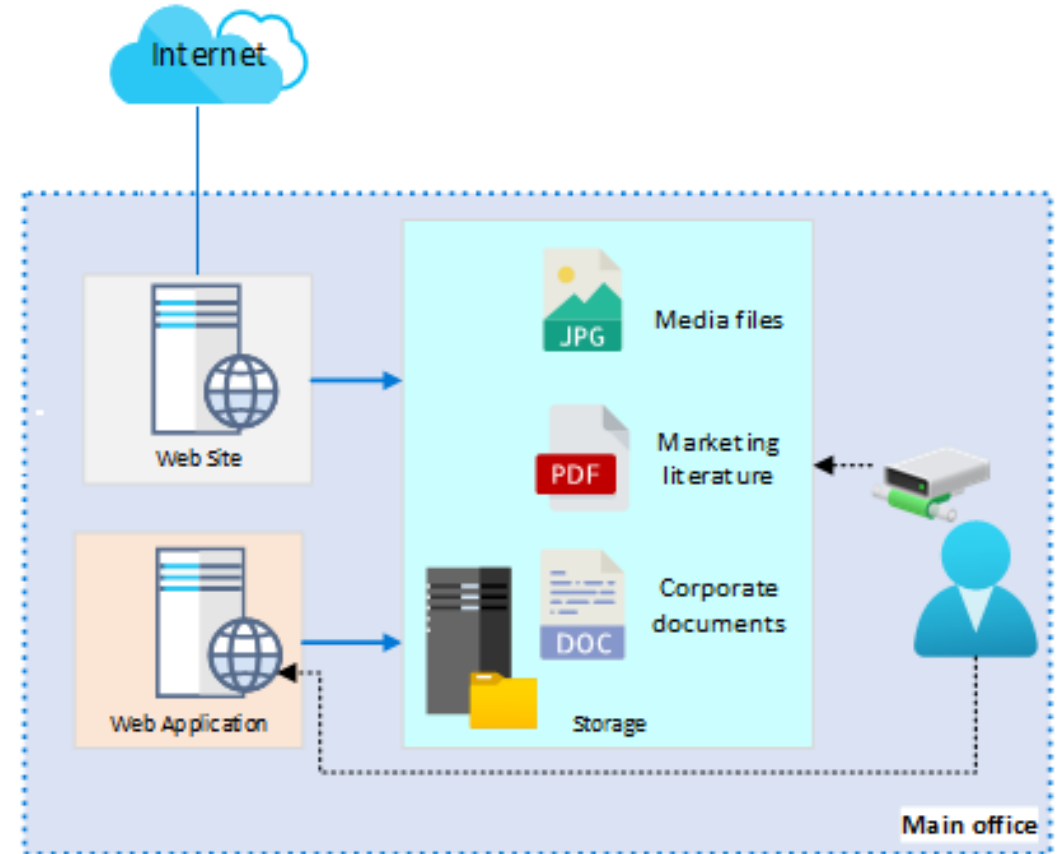- Use customer managed encryption keys

Handwritten annotations: Storage, FW, VM, NIC, 10.0.0.4, 10.0.0.5, VNet, Sub

Case study and review

Case study – Non-relational data

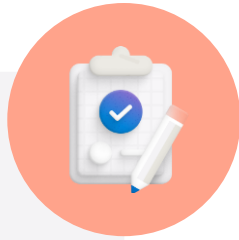| Media files	Marketing literature	Corporate documents
• Product photos and feature videos • JPEG and MP4 are most common formats	• Customer stories, sales flyers, sizing charts, and eco-friendly manufacturing information • PDF format is the most common	• Internal documents – some sensitive • Mostly Office formats like Word and Excel

Case study discussion

- Design a storage solution for Tailwind Traders.
  - What type of data is represented?
  - What factors will you consider in your design?
  - What type of storage accounts are needed?
  - Will you use blob access tiers?
  - Will you use immutable storage?
  - How will the content be securely accessed?
- Your solution should consider the media, marketing literature, and corporate documents.

Instructor Solution Diagram - Completed

Primary region

Internet → Application GW → App Services / Web Apps → Storage Account

Blob Storage

Access tiers

Azure Files Storage

EntraID

Azure Active Directory

Internet → Web Site → Media files (JPG)

Marketing literature (PDF)

Corporate documents (DOC)

Web Application

Storage

Main office
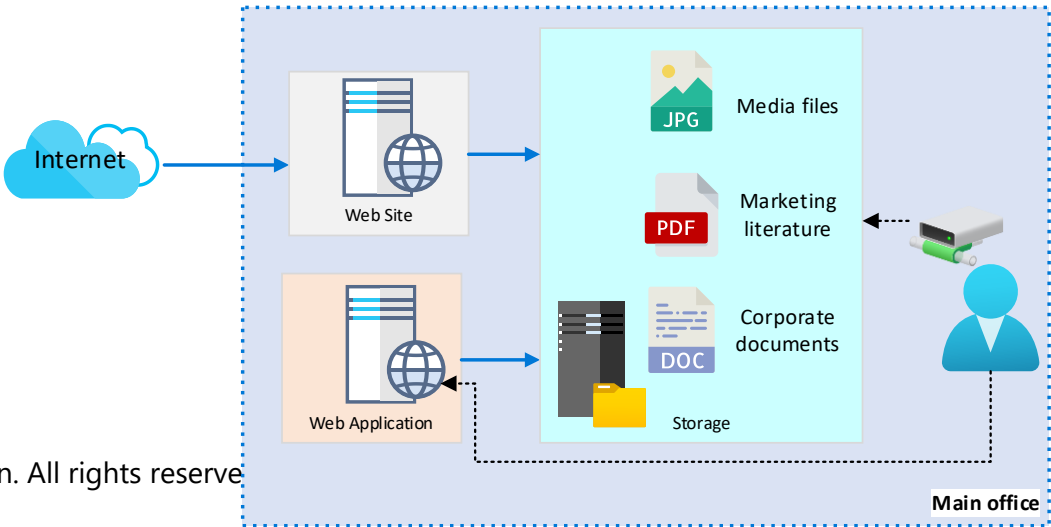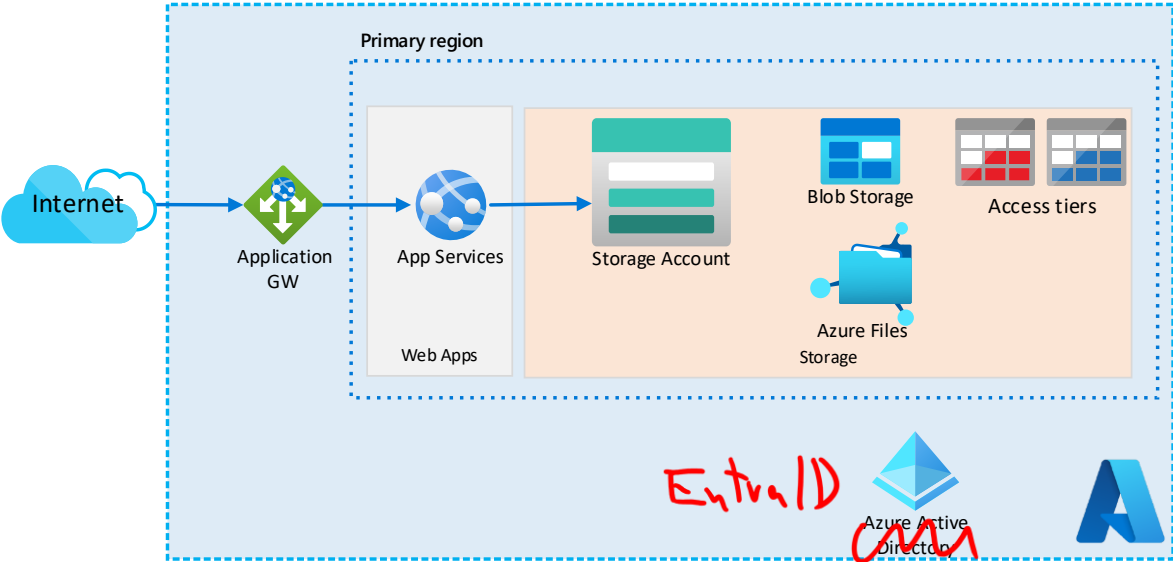
Learning recap – non-relational data solutions

Check your knowledge questions and review

- [Choose the right disk storage for your virtual machine workload](#)
- [Configure blob storage](#)
- [Optimize performance and costs by using Azure Disk Storage](#)
- [Caching and performance in Azure storage disks](#)
- [Introduction to securing data at rest on Azure](#)

Optional hands-on exercises:

- [Create a storage account using the Azure portal](#)

Instructor resources (hidden)

End of presentation