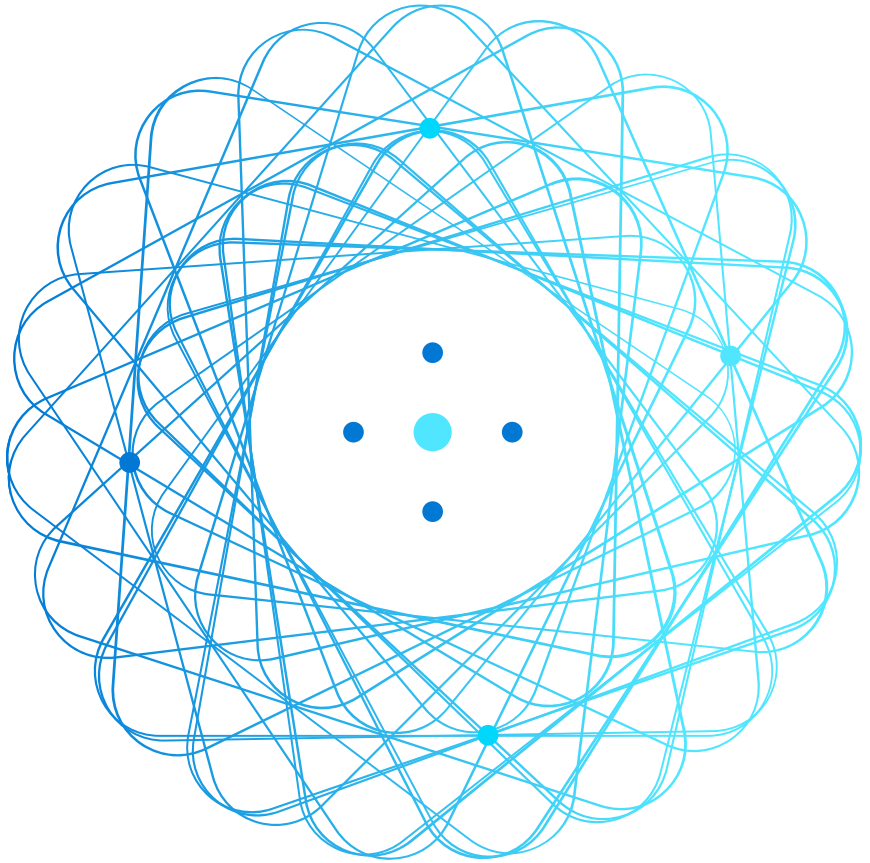
Microsoft Azure

Azure Storage Services



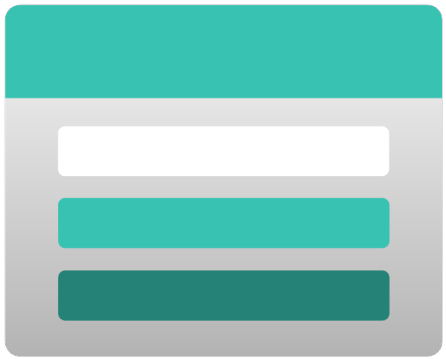
Storage - Objective Domain

Describe the benefits and usage of:

- Compare Azure storage services.
- Describe storage tiers.
- Describe redundancy options.
- Describe storage account options and storage types.
- Identify options for moving files, including AzCopy, Azure Storage Explorer, and Azure File Sync.
- Describe migration options, including Azure Migrate and Azure Data Box.

Storage accounts

- Must have a globally unique name
- Provide over-the-internet access worldwide
- Determine storage services and redundancy options



Storage redundancy

Redundancy configuration	Deployment	Durability
Locally redundant storage (LRS)	Single datacenter in the primary region	11 nines
Zone-redundant storage (ZRS)	Three availability zones in the primary region	12 nines
Geo-redundant storage (GRS)	Single datacenter in the primary and secondary region	16 nines
Geo-zone-redundant-storage (GZRS)	Three availability zones in the primary region and a single datacenter in secondary region	16 nines

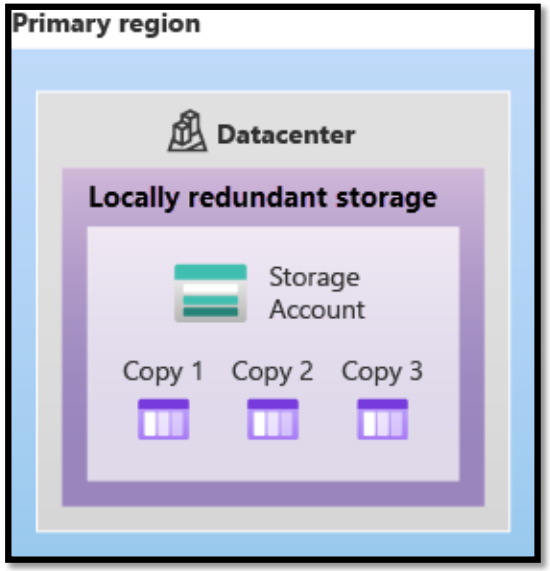
Cloud Storage has been designed for at least 99.999999999% annual durability, or 11 nines. That means that even with one billion objects, you would likely go a hundred years without losing a single one!

Determine Storage Account Kinds

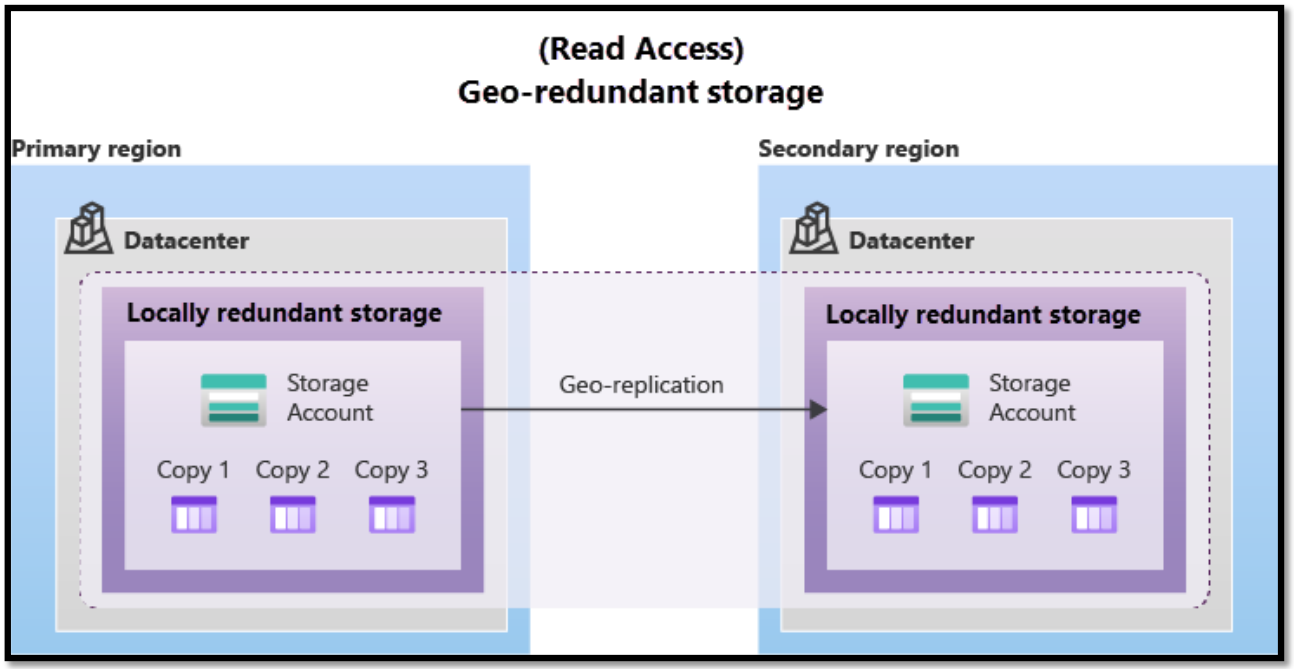
Storage Account	Recommended usage
Standard general-purpose v2	Most scenarios including Blob, File, Queue, Table, and Data Lake Storage.
Premium block blobs	Block blob scenarios with high transactions rates, or scenarios that use smaller objects or require consistently low storage latency.
Premium file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

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

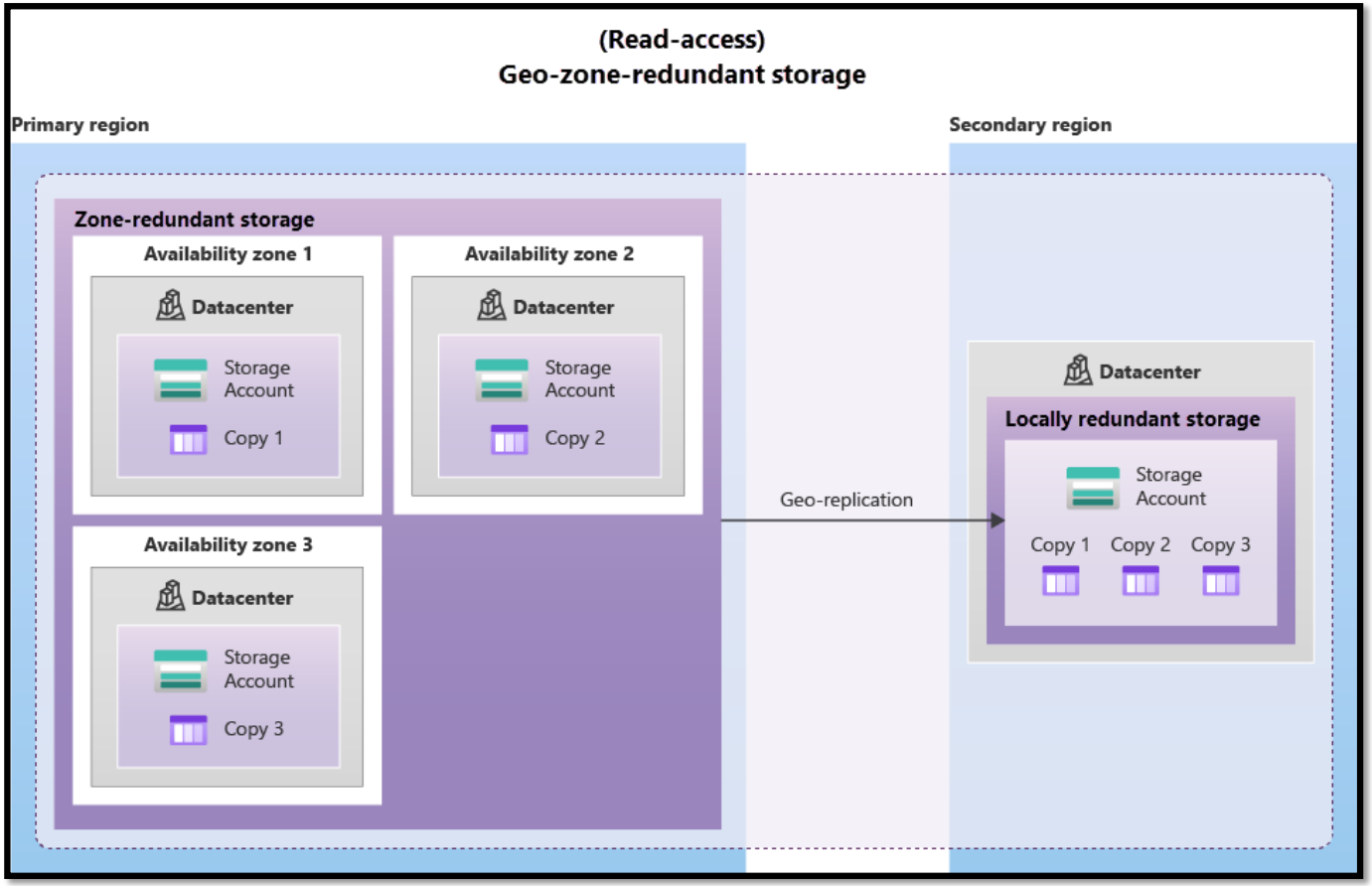
Storage Redundancy – LRS & ZRS



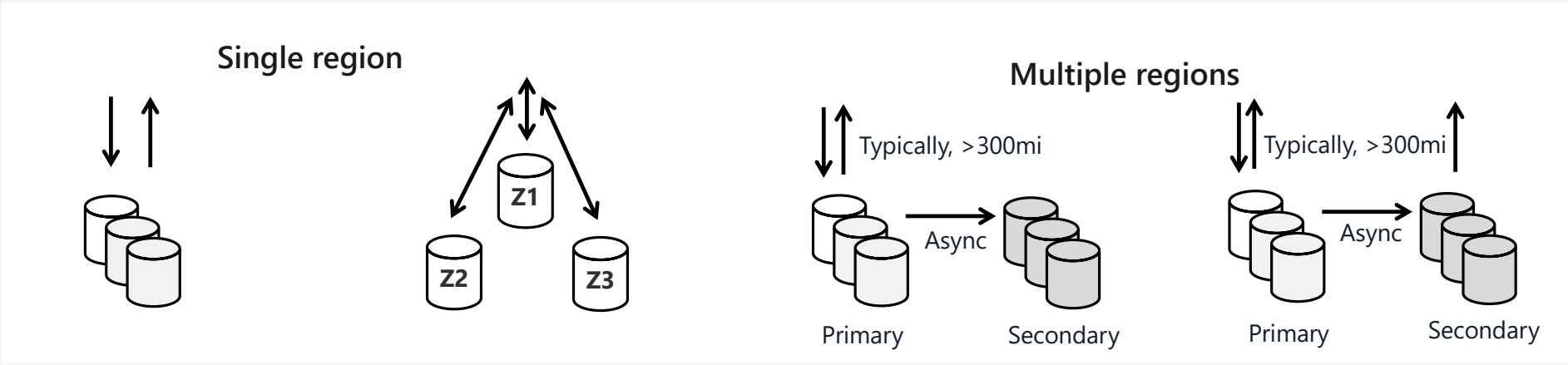
Storage Redundancy – GRS



Storage Redundancy – GZRS (RA-GRS/RA-GZRS)



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

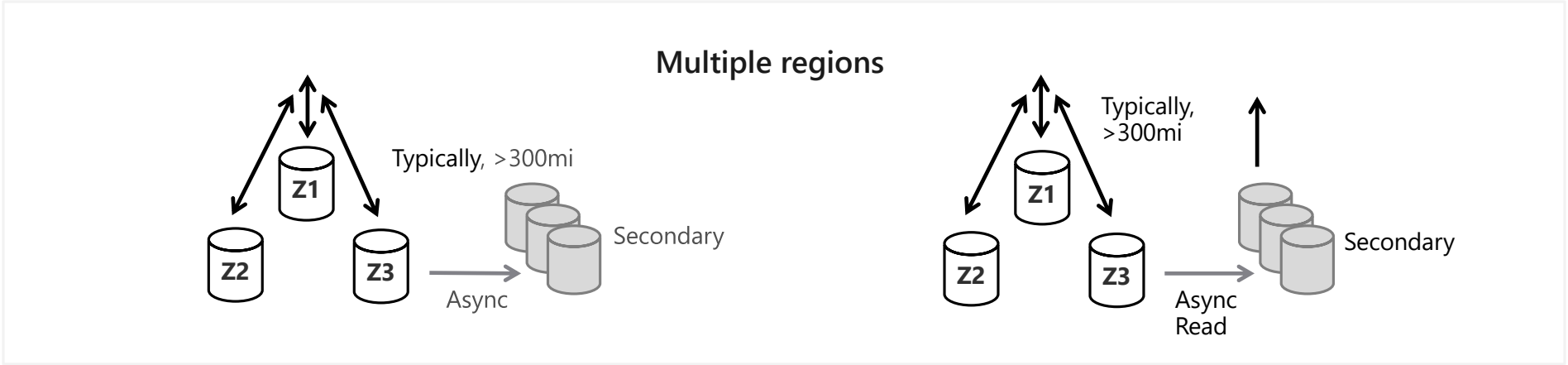
- Six replicas, two regions (three per region)
- Protects against major regional disasters
- Asynchronous copy to secondary

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)



GZRS

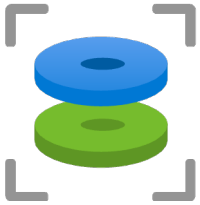
- Six replicas, 3+1 zones, two regions
- Protects against disk, node, rack, zone, and region failures
- Synchronous writes to all three zones and asynchronous copy to secondary

RA-GZRS

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

Azure storage services

Container storage (blob) is optimized for storing massive amounts of unstructured data, such as text or binary data.



Disk storage provides disks for virtual machines, applications, and other services to access and use.

Azure Files sets up a highly available network file shares that can be accessed by using the standard Server Message Block (SMB) protocol.

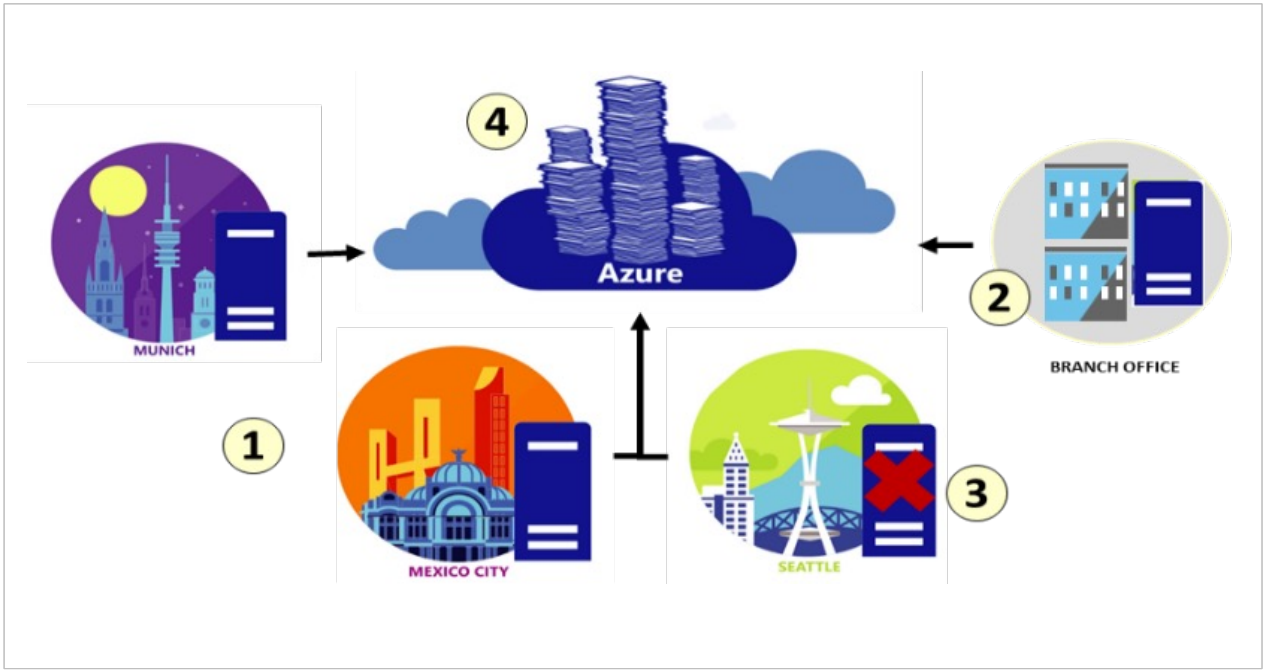
Compare Files to Blobs

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

Implement Azure File Sync

Centralize your organization's file shares in Azure Files, while keeping the flexibility, performance, and compatibility of an on-premises file server

1. Lift and shift
2. Branch Office backups
3. Backup and Disaster Recovery
4. File Archiving



Azure storage access tiers

Hot	Cool	Archive
Optimized for storing data that is accessed frequently.	Optimized for storing data that is infrequently accessed and stored for at least 30 days.	Optimized for storing data that is rarely accessed and stored for at least 180 days with flexible latency requirements.

You can switch between these access tiers at any time.

File management options

AzCopy	Azure Storage Explorer	Azure File Sync
Command line utility	Graphical user interface (similar to Windows Explorer)	Synchronizes Azure and on premises files in a bidirectional manner
Copy blobs or files to or from your storage account	Compatible with Windows, MacOS, and Linux	Cloud tiering keeps frequently accessed files local, while freeing up space
One-direction synchronization	Uses AzCopy to handle file operations	Rapid reprovisioning of failed local server (install and resync)