High Availability and Disaster Recovery in Azure

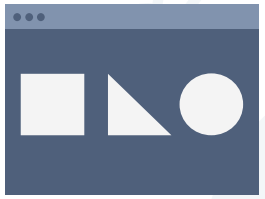
A VIAcode BCDR Resource

DEFINITIONS

High Availability vs Disaster Recovery

- **High Availability** - eliminating single points of failure using failover mechanism

  Ex. Failover using Azure Site Recovery



- **Disaster recovery** - getting a system back to an operational state after meltdown using backups

  Ex. Recovering from dirty data using Azure Backup

Elements of High Availability

REDUNDANCY

Ensuring that any elements critical to system operations have an additional, redundant component that can take over in case of failure.

MONITORING

Collecting data from a running system and detecting when a component fails or stops responding.

FAILOVER

A mechanism that can switch automatically from the currently active component to a redundant component, if monitoring shows a failure of the active component.

OVERVIEW

Elements of Disaster Recovery

Service Level Agreement

level of service expected by a customer from a supplier, laying out the metrics by which that service is measured

Ex 99.99% SLA means 52:34 of downtime per year

Recovery Time Objective

corresponds to the maximum time under which a failed workload must be recovered

Ex 5 min to full recovery

Recovery Point Objective

represents the maximum amount of data that an organization can afford to lose

Ex 6 hours of data

COMPARISON

Looks good, but how much does it cost?

High Availability

2x Current Infra

+

network load balancing

Disaster Recovery

2x Current Storage

+

backup network traffic

COMPARISON

High Availability vs Disaster Recovery

	PRO	RTO	Operational Recovery	Data corruption Recovery	Cost
High Availability	Seconds	Seconds	Auto*	NO	High
Disaster Recovery	Hours	Hours	Manual	YES	Low

RESOURCES

High Availability

Resource Type	Azure features	References (click links to access reference docs)
Compute	• Availability Set • Availability Zones	• Availability sets overview - Azure Virtual Machines | Microsoft Docs • Availability options for Azure Virtual Machines - Azure Virtual Machines | Microsoft Docs • Regions and Availability Zones in Azure | Microsoft Docs
Storage	• Azure Storage Redundancy (LRS, ZRS, GRS, RA-GRS, GZRS)	• Data redundancy - Azure Storage | Microsoft Docs • Use geo-redundancy to design highly available applications - Azure Storage | Microsoft Docs
Database	• Azure SQL Database & Azure SQL Managed Instance (Standard and Premium availability model) • Azure SQL Database & Azure SQL Managed instance auto-failover group • Always On Availability Group • Always On Failover Cluster	• What is Azure SQL Managed Instance? - Azure SQL Managed Instance | Microsoft Docs • High availability - Azure SQL Database and SQL Managed Instance | Microsoft Docs • High availability, disaster recovery, business continuity - SQL Server on Azure VM | Microsoft Docs • Set up disaster recovery for SQL Server with Azure Site Recovery - Azure Site Recovery | Microsoft Docs • Auto-failover groups - Azure SQL Database & SQL Managed Instance | Microsoft Docs • Overview of SQL Server Always On availability groups - SQL Server on Azure VM | Microsoft Docs • Availability groups: a high-availability and disaster-recovery solution - SQL Server Always On | Microsoft Docs
Network	• Traffic Manager • Azure Front Door • Application Gateway • Network Load Balancer	• Azure Traffic Manager | Microsoft Docs • Azure Front Door | Microsoft Docs • Quickstart: Set up high availability with Azure Front Door Service - Azure portal | Microsoft Docs • What is Azure Application Gateway | Microsoft Docs
App Services	• App Services Environment	• Highly available multi-region web app - Azure Architecture Center | Microsoft Docs • High availability enterprise deployment using App Services Environment - Azure Reference Architectures | Microsoft Docs • Multi-tier web application built for HA/DR - Azure Example Scenarios | Microsoft Docs
Containers	• Azure Kubernetes Service (AKS)	• Best practices for AKS business continuity and disaster recovery - Azure Kubernetes Service | Microsoft Docs

RESOURCES

Disaster Recovery

Resource Type	Azure features	References (click links to access reference docs)
Compute	• Azure Backup (Azure Virtual Machine) • Azure Site Recovery	• What is Azure Backup? - Azure Backup | Microsoft Docs • Overview of operational backup for Azure Blobs - Azure Backup | Microsoft Docs • About Azure Site Recovery - Azure Site Recovery | Microsoft Docs
Storage	• Azure Backup (Azure Storage (Azure Files))	• Overview of Backup center - Azure Backup | Microsoft Docs
Database	• Azure Backup (SQL in Azure VM) • Azure SQL Database & Azure SQL Database Managed Instance Built-in Backup	• Back up multiple SQL Server VMs from the vault - Azure Backup | Microsoft Docs • Set up disaster recovery for SQL Server with Azure Site Recovery - Azure Site Recovery | Microsoft Docs • Backup & restore with Azure Blob Storage - SQL Server | Microsoft Docs
App Services	• Backup and Restore	• Back up your app in Azure • Back up an app - Azure App Service | Microsoft Docs • Architecture Center | Microsoft Docs • Multi-tier web application built for HA/DR - Azure Example Scenarios | Microsoft Docs
On-Premises	• Azure StorSimple • Backup Server, Azure Backup	• Archive on-premises data to the cloud • Microsoft Azure StorSimple Virtual Array overview | Microsoft Docs • Introduction to Azure File Sync | Microsoft Docs • Back up on-premises applications and data to the cloud
All resources	• Infrastructure as Code (IaaC)	• What is Infrastructure as Code? - Azure DevOps | Microsoft Docs • Repeatable Infrastructure - Azure Architecture Center | Microsoft Docs

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