Azure Infrastructure as Code Bootcamp

High Availability and Fault Tolerance

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Course Agenda

- Day 1
  - High Availability in Azure Storage
- Day 2
  - High Availability in Azure Compute
- Day 3
  - Global Availability in Azure

Day 1: High Availability in Azure Storage

Day 1 Learning Goals

- Availability and Fault Tolerance in Azure
- Availability in Azure Storage Accounts
- Implement High Availability in Azure SQL Databases
- Implement High Availability in Cosmos DB

Course Materials

timw.info/inebootcamp

Relevant Microsoft Certification

CERTIFICATION EXAM **AZ-104**

Microsoft Azure Administrator

ASSOCIATE CERTIFICATION

Microsoft Certified: Azure Administrator Associate

Relevant Microsoft Certification

Complete one prerequisite **AZ-104** Take one exam **AZ-305** Earn the certification

PREREQUISITE OPTION 1

Microsoft Certified: Azure Administrator Associate

CERTIFICATION EXAM

Designing Microsoft Azure Infrastructure Solutions

EXPERT CERTIFICATION

Microsoft Certified: Azure Solutions Architect Expert

Foundational Concepts

High Availability vs Fault Tolerance

- **Highly available** environments have zero downtime at higher cost
- **Fault-tolerant** environments have minimal downtime at lower cost

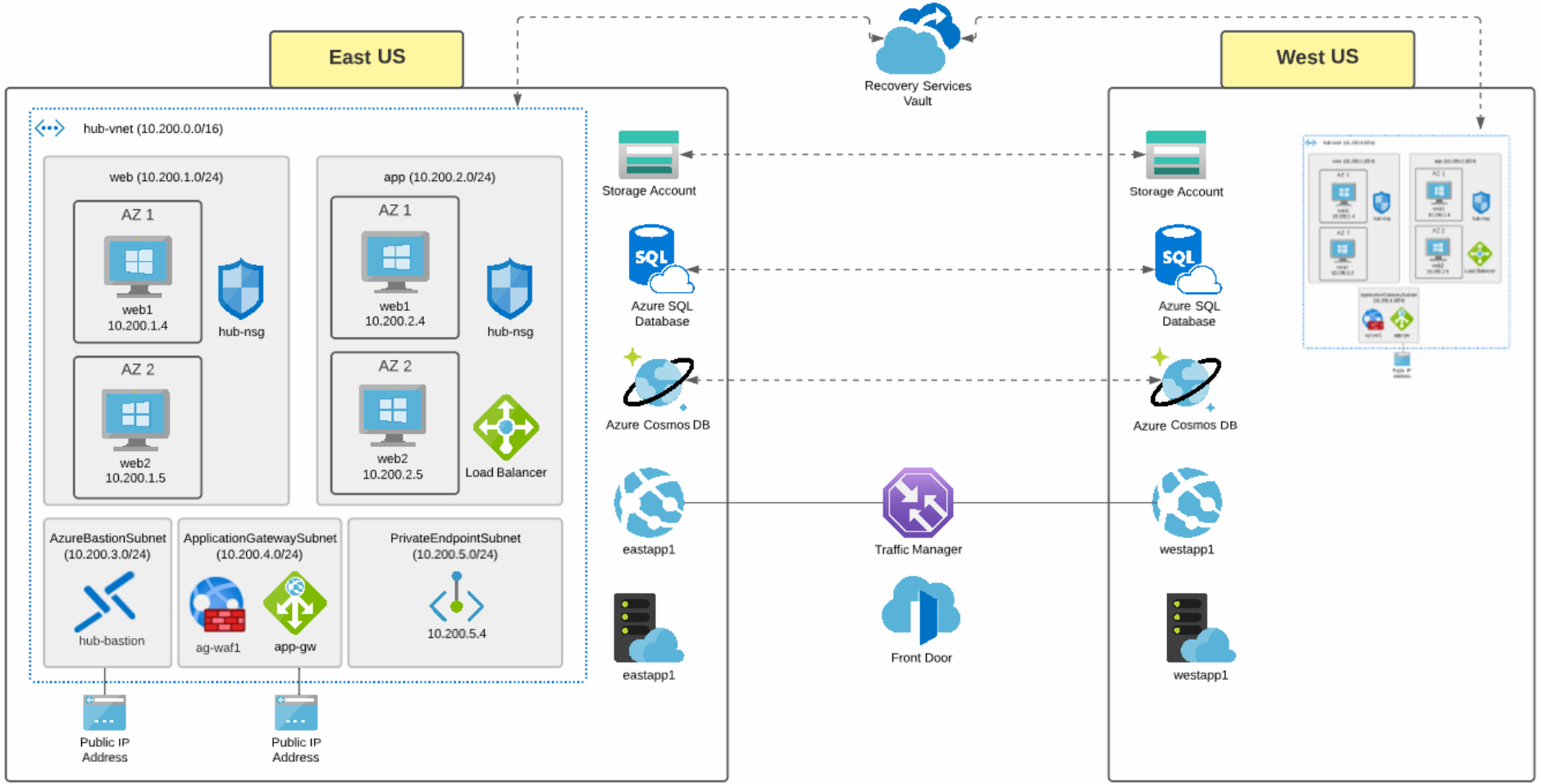
Reference: timw.info/hfn

Azure Well-Architected Framework

Pillar	Description
Reliability	The ability of a system to recover from failures and continue to function.
Security	Protecting applications and data from threats.
Cost Optimization	Managing costs to maximize the value delivered.
Operational Excellence	Operations processes that keep a system running in production.
Performance Efficiency	The ability of a system to adapt to changes in load.

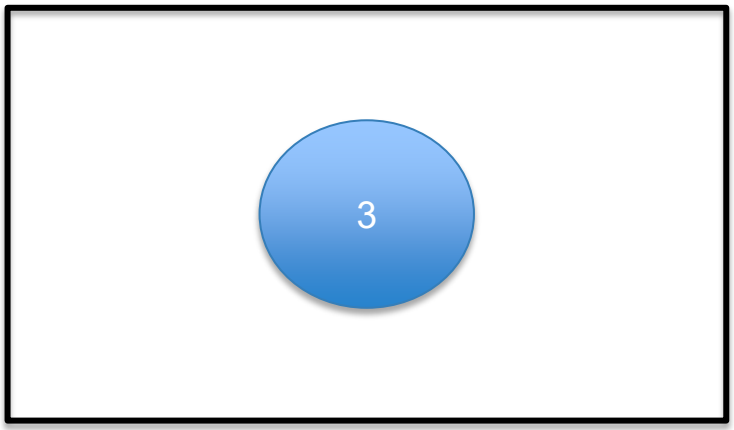
Reference: timw.info/c3l

Class Reference Topology

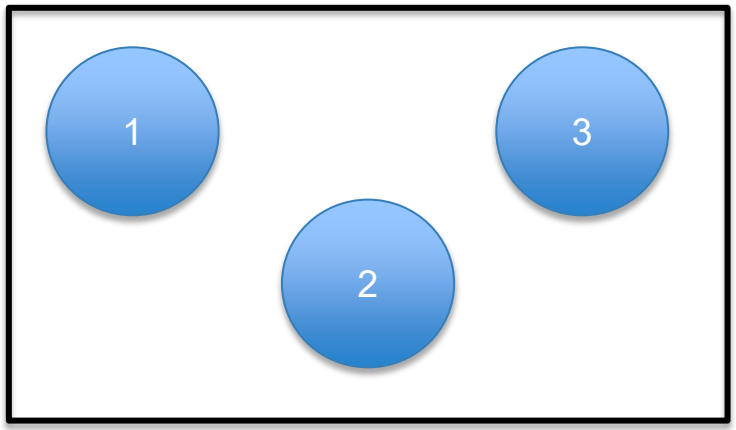


Azure Storage

Storage Account Replication

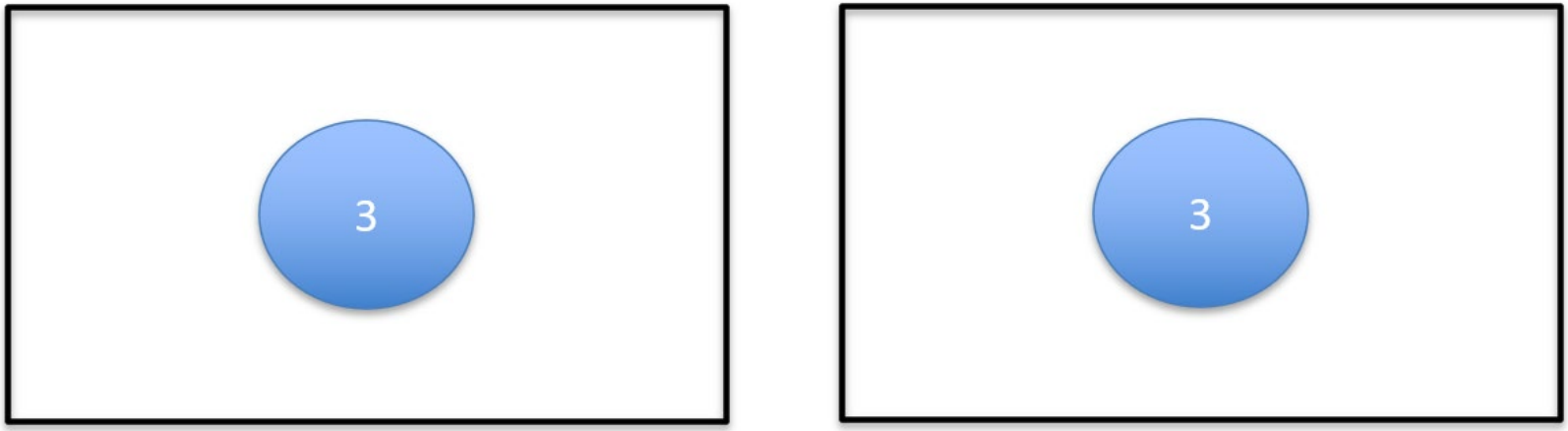


LRS



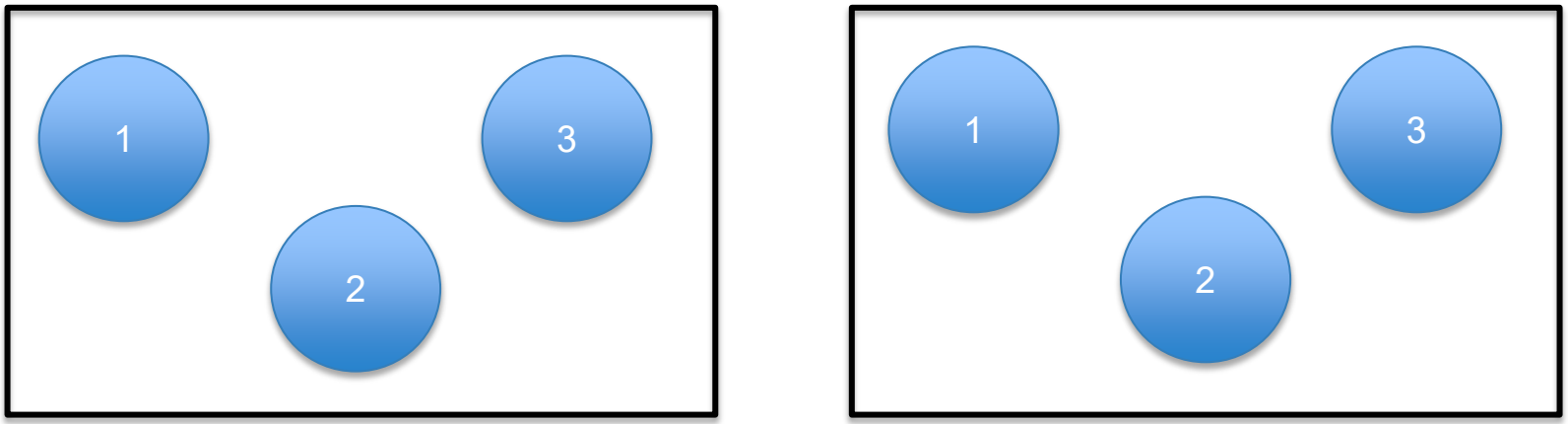
ZRS

Storage Account Replication



GRS / RA-GRS

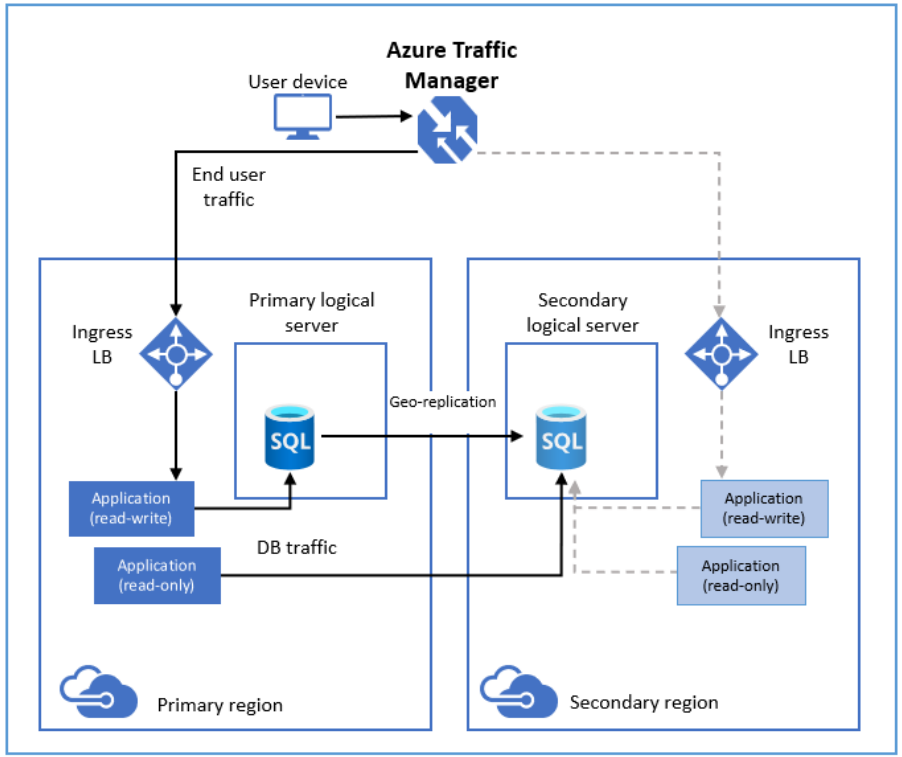
Storage Account Replication



GZRS / RA-GZRS

Azure SQL Database

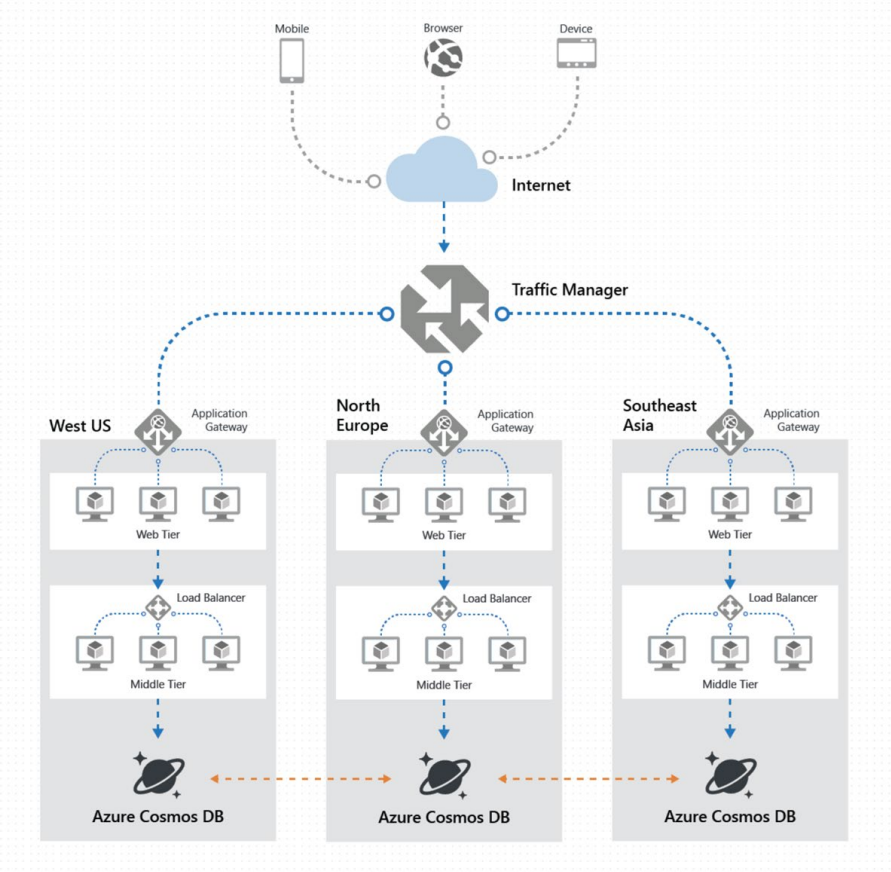
Azure SQL Database Geo-Replication



Reference: timw.info/iky

Azure Cosmos DB

Cosmos DB Multi-Master Replication



Reference: timw.info/v5b

Looking Ahead to Day 2

- Provision Virtual Machines in Specific Availability Zones
- Implement an Azure Load Balancer
- Use Azure Application Gateway to Implement Load Balancing
- Configure an Azure App Service for High Availability
- Provision a highly available Azure Kubernetes Service

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High Availability and Fault Tolerance

Day 2: High Availability in Azure Compute

Day 2 Learning Goals

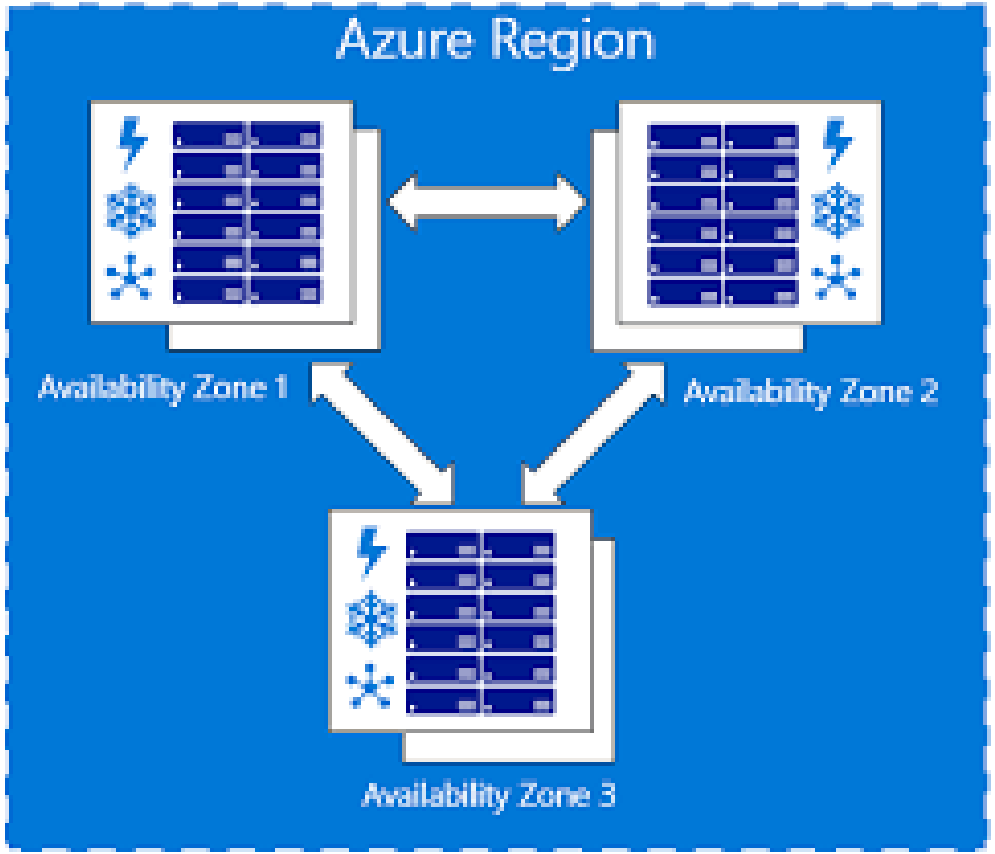
- Provision Virtual Machines in Specific Availability Zones
- Implement an Azure Load Balancer
- Use Azure Application Gateway to Implement Load Balancing
- Configure an Azure App Service for High Availability
- Provision a highly available Azure Kubernetes Service

Azure Compute Single Region High Availability

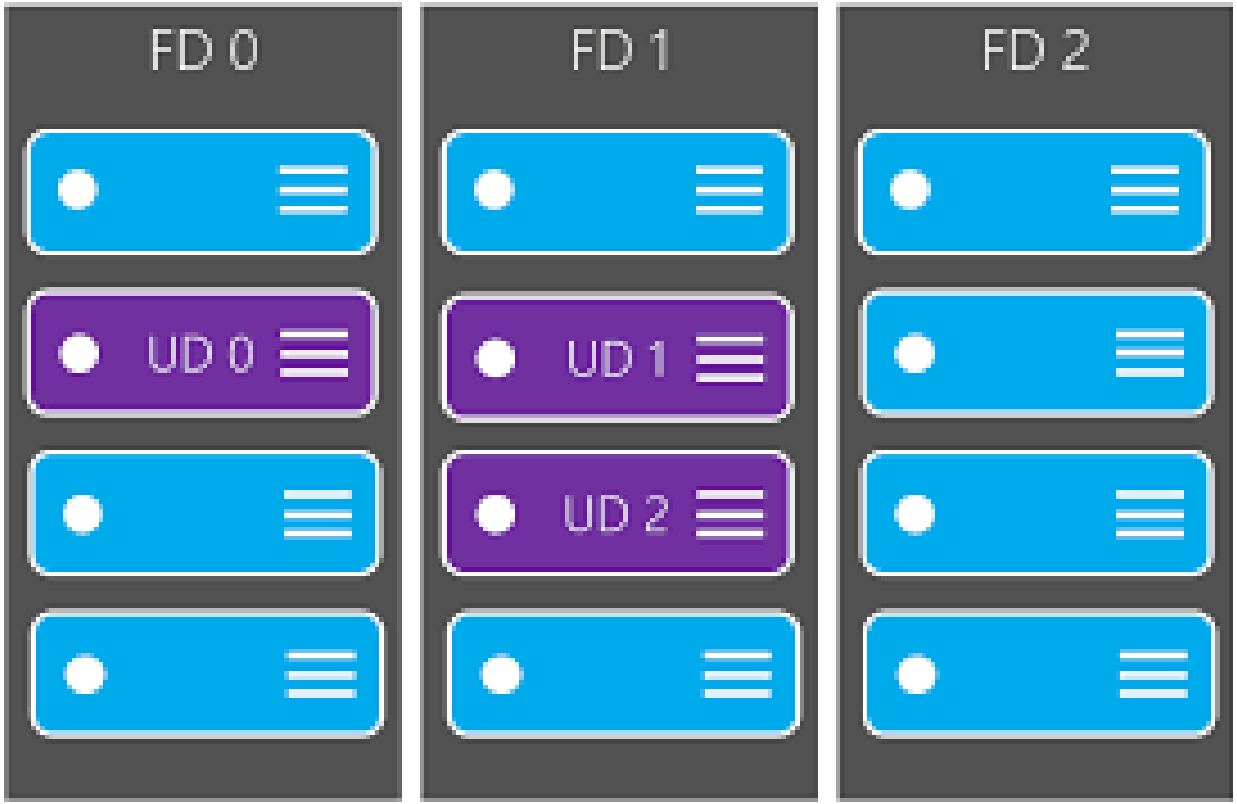
Azure Compute Services

- Azure Virtual Machines
- Azure Batch
- Azure Kubernetes Service
- Azure Service Fabric
- Azure Container Apps
- Azure App Service
- Azure Functions
- Azure Virtual Desktop

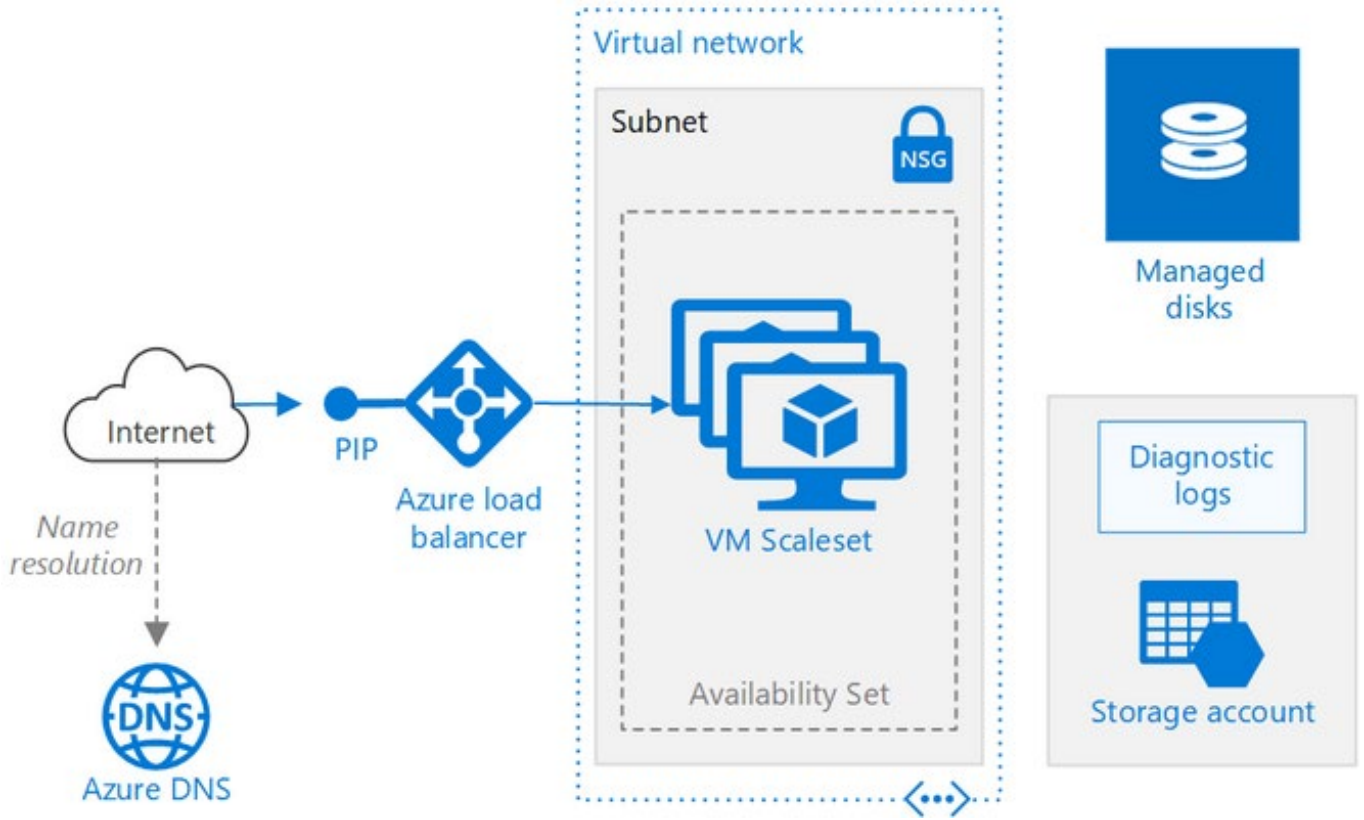
Availability Zones



Availability Sets

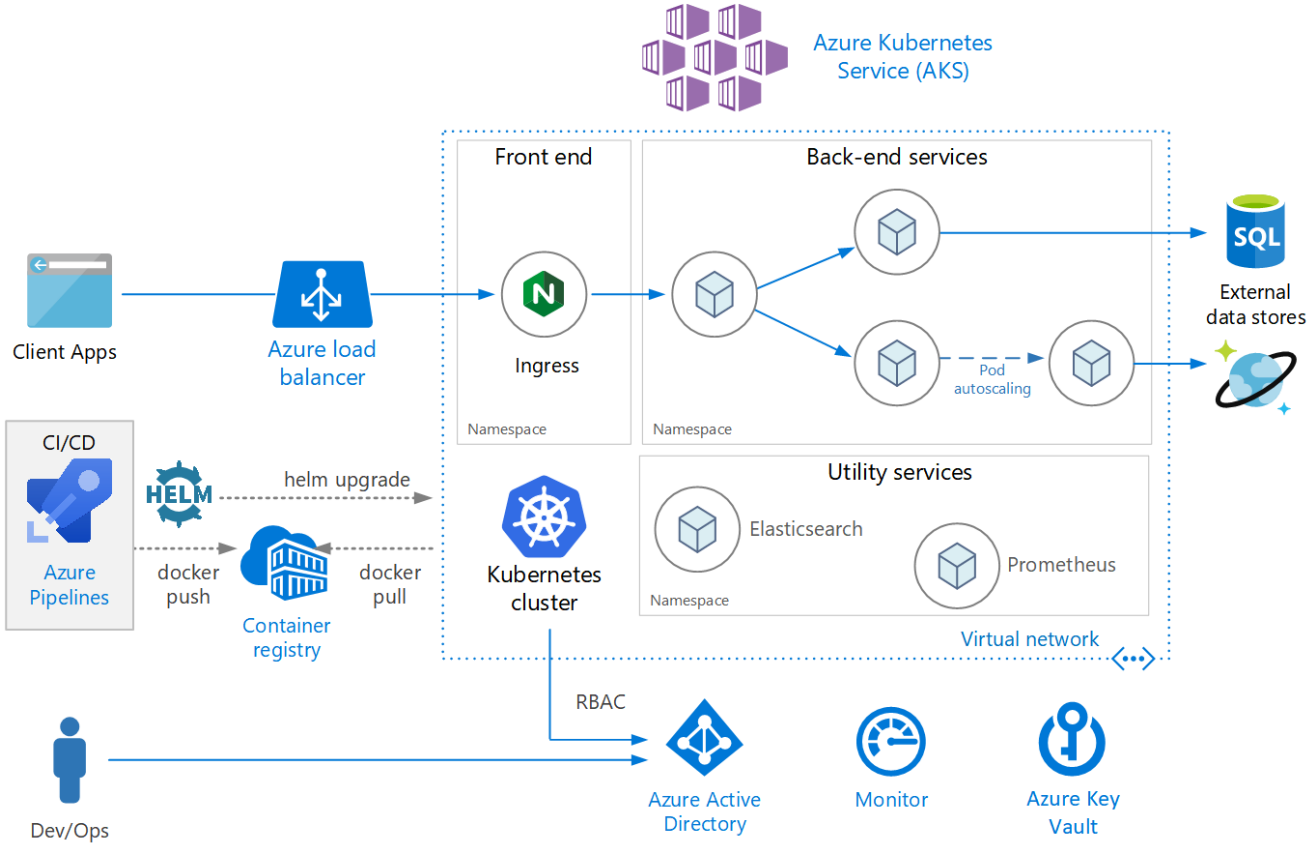


VM Scale Sets (VMSS)



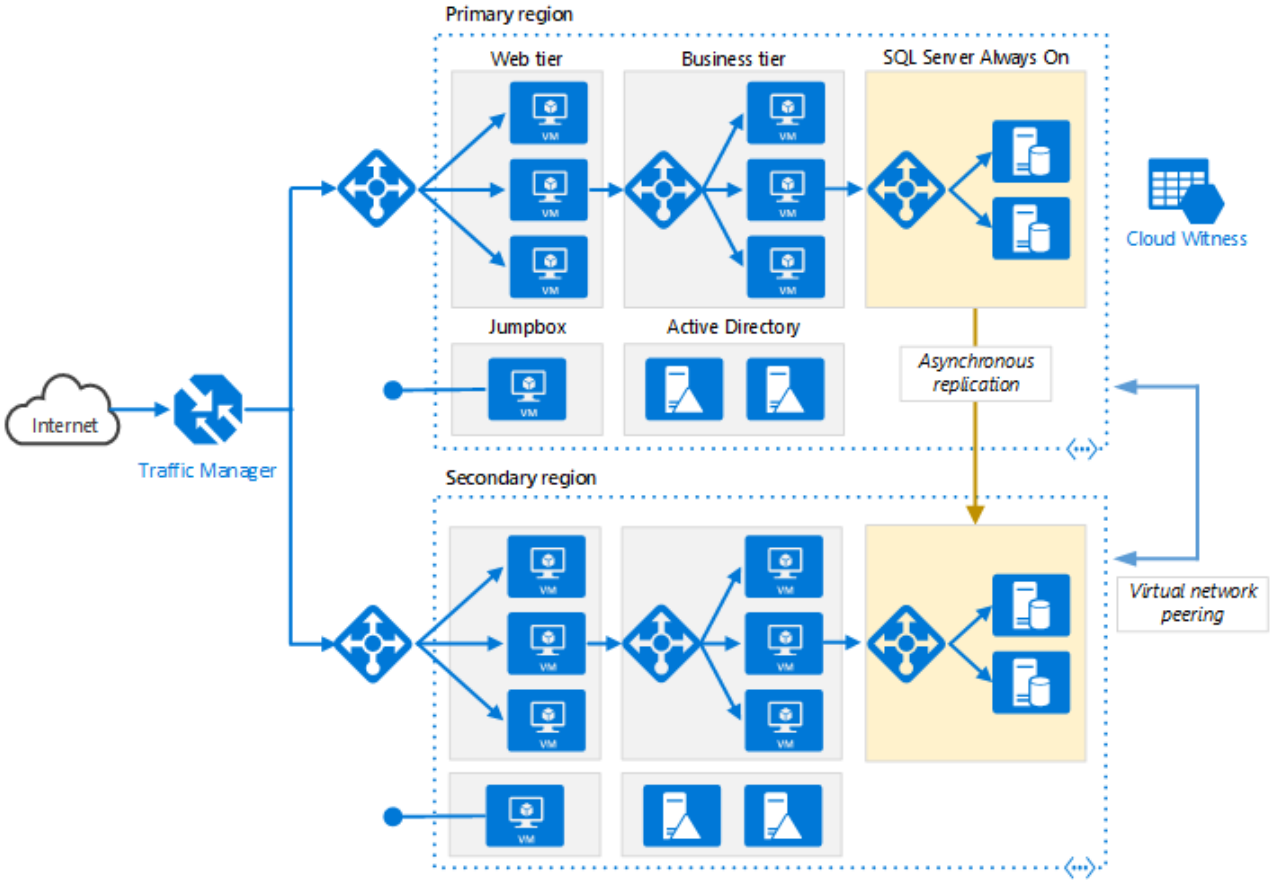
Reference: timw.info/1z8

Azure Kubernetes Service (AKS)

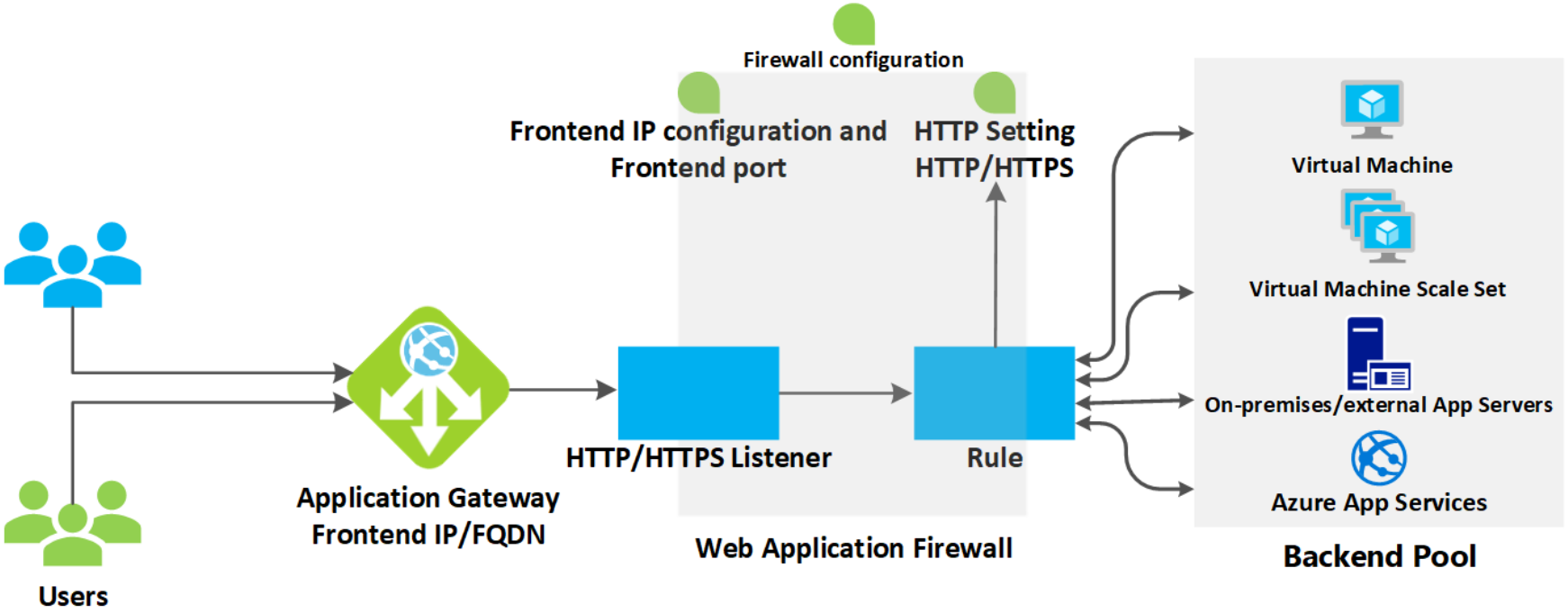


Reference: timw.info/ti3

Azure Load Balancer



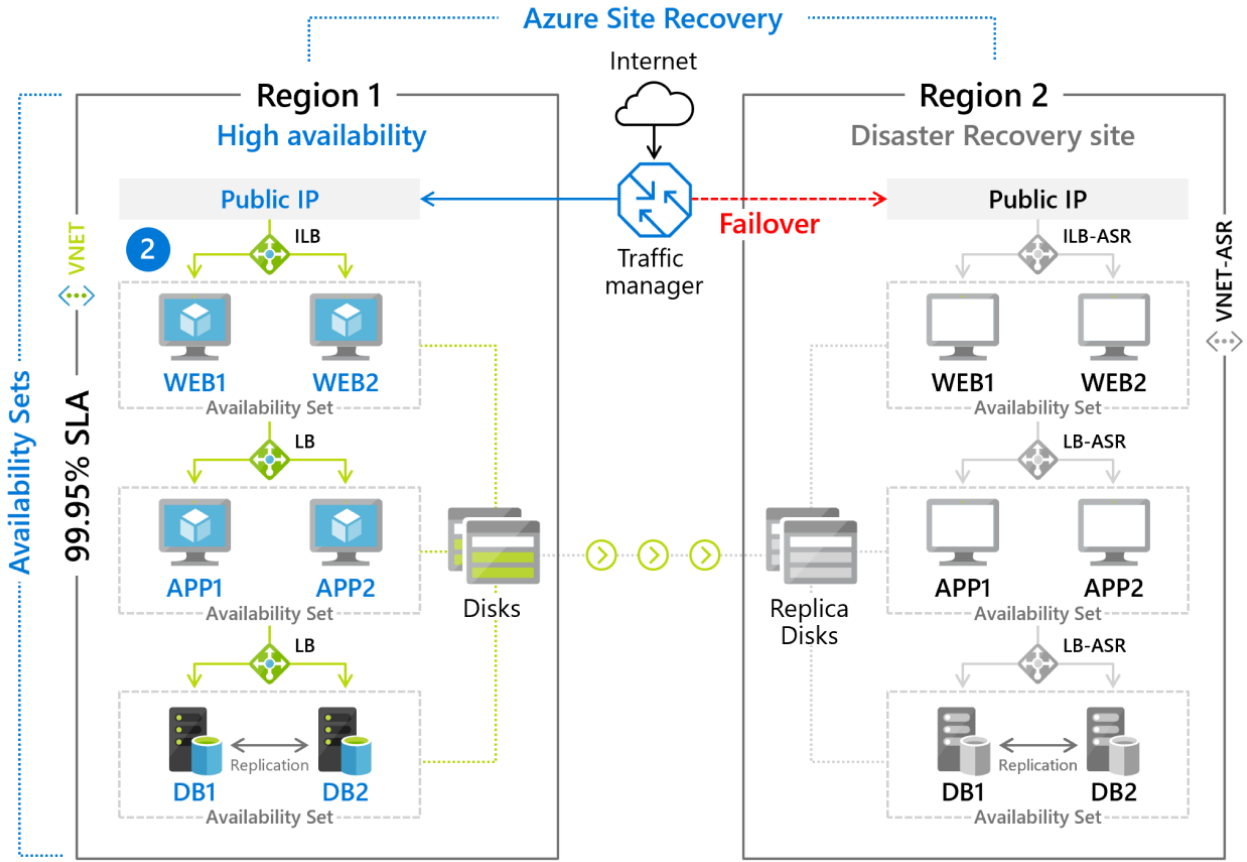
Azure Application Gateway



Reference: timw.info/wmt

Azure Compute Multi -Region High Availability

Azure Site Recovery (ASR)



Looking Ahead to Day 3

- Build solutions with Azure Traffic Manager
- Cross-Region Load Balancing with Azure Load Balancer
- Build Global Solutions with Azure Front Door

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Day 3: Global Availability in Azure

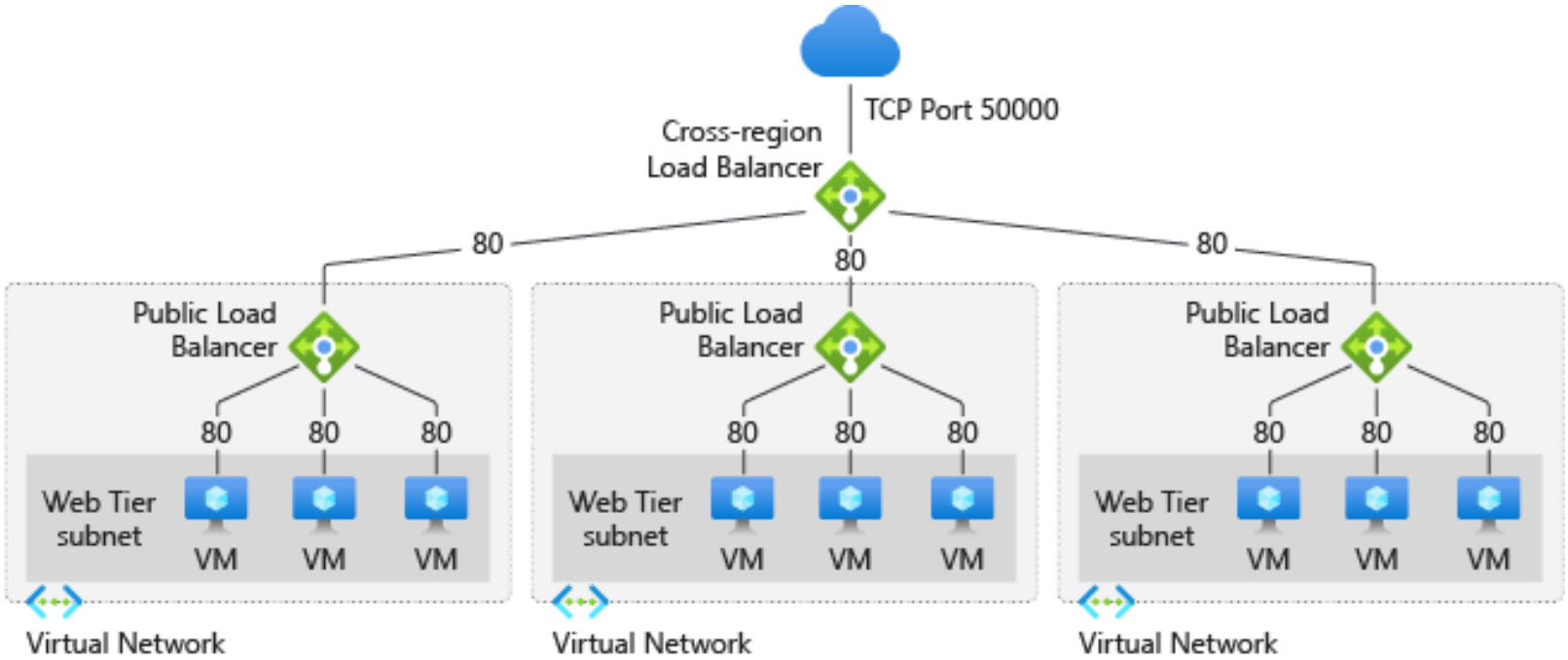
Day 3 Learning Goals

- Build solutions with Azure Traffic Manager
- Cross-Region Load Balancing with Azure Load Balancer
- Build Global Solutions with Azure Front Door
- Evaluation (10 mins)

Azure App Service

Reference: timw.info/blah

Cross-Region Load Balancer



Reference: timw.info/qq7

Title

Reference: timw.info/blah

Demo

Course Evaluation

timw.info/ineeval

Thanks so much!

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