
OVERVIEW OF AZURE SUBSCRIPTIONS, MANAGEMENT GROUPS, AND RESOURCES

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Introduction to Azure Subscriptions



Azure Subscription is a logical container used to provision resources in Azure.

Purpose: It helps organize resources and manage access and billing.

Key Components:

- Billing
- Resource Access Control
- Limits and Quotas

Features of Azure Subscriptions



- Billing and Cost Management:
 - Separate billing for different projects or departments.
- Access Management:
 - Role-Based Access Control (RBAC) for resource management.
- Resource Organization:
 - Grouping resources for better management.
- Scalability:
 - Ability to scale resources within the subscription.

Introduction to Management Groups



- Definition: Management Groups are containers that help you manage access, policy, and compliance across multiple subscriptions.
- Purpose: Simplify the management of large-scale environments with multiple subscriptions.

**Management
groups**



Subscriptions



**Resource
groups**



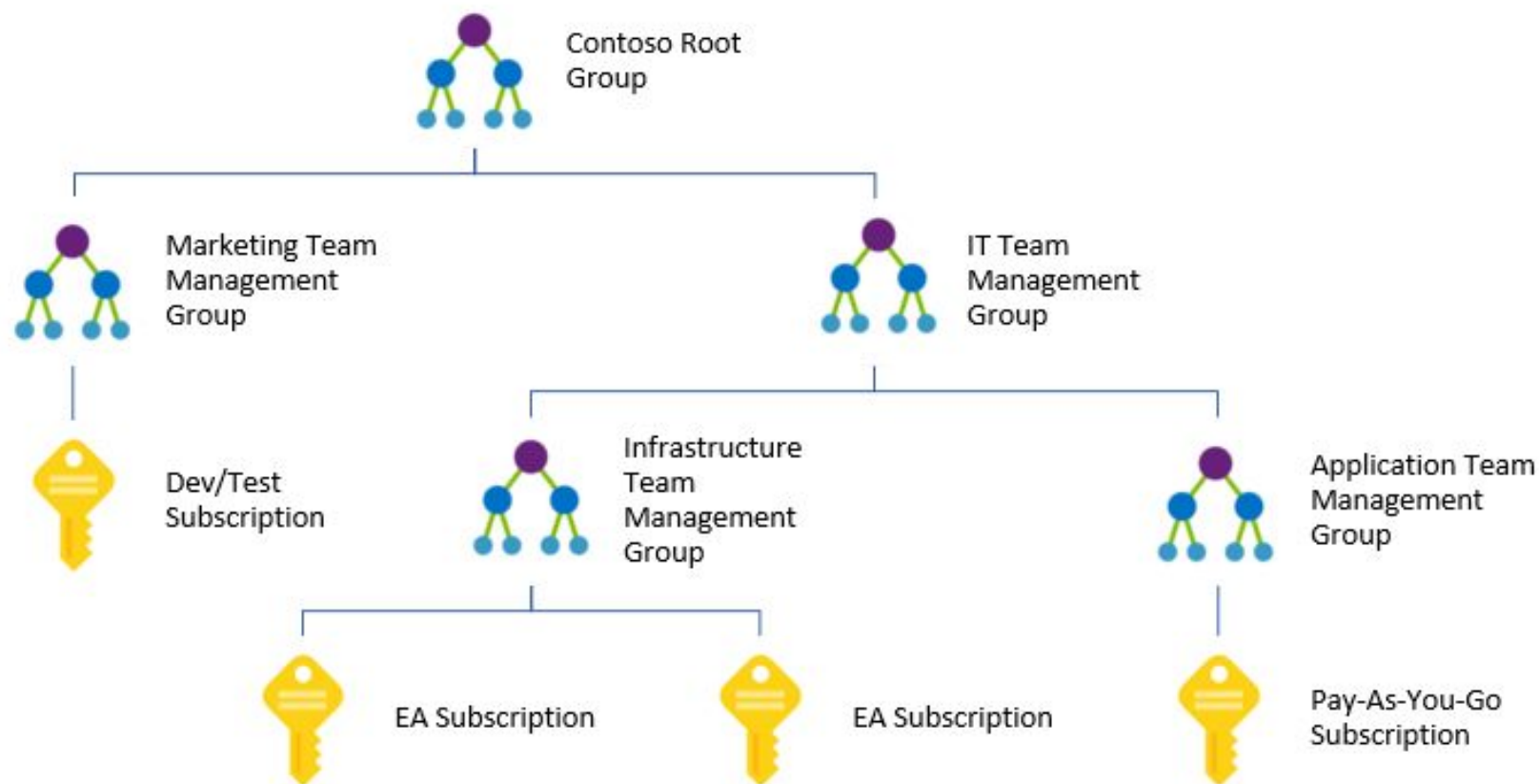
Resources



Hierarchy and Organization of Management Groups



- Hierarchy:
 - Root Management Group
 - Child Management Groups
 - Subscriptions
- Organization: Allows for hierarchical organization aligning with organizational structure.
- Policy Application: Policies and RBAC can be applied at different levels.



Introduction to Azure Resources



Definition: Azure Resources are instances of services you create, such as virtual machines, databases, and storage accounts.

Management: Managed via the Azure Resource Manager (ARM).

Developer Services



Visual Studio Team
Services



Azure DevTest
Labs*



VS Application
Insights*



HockeyApp



Developer Tools

Management & Security



Azure Portal



Scheduler



Automation



Log Analytics



Key Vault



Security Center*

Compute



Virtual Machines



Virtual Machine
Scale Sets



Cloud Services



Batch



RemoteApp



Service Fabric



Azure Container
Service



Web Apps



Mobile Apps



Logic Apps*



API Apps



API Management



Notification Hubs



Mobile
Engagement



Functions*

Data & Storage



SQL Database



DocumentDB



Redis Cache



Storage: Blobs,
Tables, Queues,
Files and Disks



StorSimple



Search



SQL Data
Warehouse*



SQL Server Stretch
Database*

Analytics



Data Lake
Analytics*



Data Lake Store*



HDInsight



Machine Learning



Stream Analytics



Data Factory



Data Catalog



Power BI
Embedded*

Internet of Things & Intelligence



Azure IoT Suite



Azure IoT Hub



Event Hubs



Cortana Intelligence
Suite



Cognitive Services*

Media & CDN



Media Services



Content Delivery
Network

Identity & Access Management



Azure Active
Directory



B2C*



Domain Services*



Multi-Factor
Authentication

Types of Azure Resources



Compute Resources:

- Virtual Machines
- App Services

Storage Resources:

- Blob Storage
- Disk Storage



Network Resources:

- Virtual Networks
- Load Balancers

Database Resources:

- SQL Databases
- Cosmos DB

Resource Management and Governance



- Azure Resource Manager (ARM):
 - Deployment and management service for Azure.
- Policies and Compliance:
 - Enforce standards and compliance.
- Tagging:
 - Metadata tags for resource organization and billing.
- Monitoring:
 - Tools like Azure Monitor and Application Insights.

Best Practices for Organizing Subscriptions, Management Groups, and Resources.

- Use Management Groups for Hierarchical Organization:
 - Align management groups with organizational structure.
- Separate Subscriptions by Environment or Department:
 - Development, Testing, Production.
- Apply Policies at Management Group Level:
 - Ensure compliance and governance.
- Use Resource Tags Effectively:
 - For cost management and operational insights.

Administrative Labs



Lab 1: Management Groups

Objective: Create and manage Management Groups.

Lab 2: Subscriptions

Objective: View and manage Azure Subscriptions.

Lab 3: Billing Account

Objective: View and manage billing accounts.

Lab 4: Budget and Alerts

Objective: Create and manage budgets and set up cost alerts.

Summary



- Azure Subscriptions help manage billing and access.
- Management Groups offer hierarchical management across subscriptions.
- Azure Resources encompass all services and are managed via ARM.
- Effective Organization:
 - Ensures better management, compliance, and cost control.

Quiz Time!



Azure Subscriptions, Management Groups, and Resources

<https://quizizz.com/admin/quiz/66641b4f08ea0a892519befc>

"The future
belongs to those
who believe in the
beauty of their
dreams." —
Eleanor Roosevelt

Azure Compute Services

Azure Virtual Machines



- What are Virtual Machines?
 - a. VMs are emulations of computer systems.
 - b. They provide the functionality of a physical computer.
- Why Azure Virtual Machines?
 - a. On-demand, scalable computing resources.
 - b. Flexibility: Choice of OS, size, and configuration.
 - c. Scalability: Adjust resources based on demand.
 - d. Support for Windows and Linux.
 - e. Full administrative control over the VM.

Creating an Azure Virtual Machine



Step-by-Step Process:

1. Sign in to Azure Portal:

- Access the Azure portal (portal.azure.com).

2. Create a Resource:

- Click on "Create a resource" and select "Virtual Machine."

3. Configure Basics:

- Select subscription, resource group, and VM name.
- Choose the region and availability options.
- Select the OS (Windows or Linux).

Steps to create an Azure Virtual Machine



4. Choose VM Size:

- Pick a VM size based on the required CPU, memory, and storage.

5. Configure Settings:

- Set up administrator account.
- Configure networking, management, and monitoring options.

6. Review and Create:

- Review the configuration and create the VM.

Managing an Azure Virtual Machine



- **Azure Portal:**
 - Manage VMs through the Azure portal interface.
 - Monitor performance, health, and utilization.
 - Perform operations like starting, stopping, and restarting VMs.
- **Azure CLI & PowerShell:**
 - Command-line tools for scripting and automation.
 - Useful for managing multiple VMs and integrating with CI/CD pipelines.
- **Azure Resource Manager (ARM) Templates:**
 - Define infrastructure as code.
 - Automate VM deployment and configuration.
 - Ensure consistent environments.

Advanced Features of Azure Virtual Machines



High Availability:

- **Availability Sets:** Group VMs to ensure that at least one VM remains running during maintenance or failures.
- **Availability Zones:** Physically separate data centers within an Azure region.

Disaster Recovery:

- **Azure Site Recovery:** Replicate VMs to another Azure region.
- **Backup Services:** Regular backups of VM data.

Single VM

Availability Sets

Availability Zones

Region Pairs

Easier lift and shift

Protecting against failures within datacentres

Protecting from entire datacentres failure

Regional protection within data residency boundaries



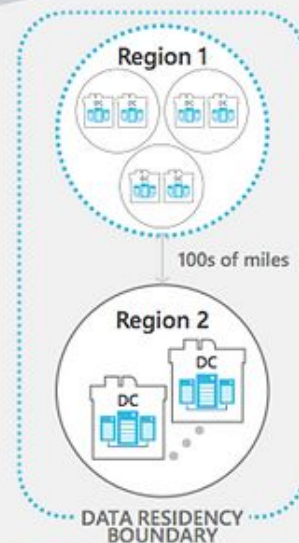
VM SLA
99.9%
with premium
storage



Protection from...
Hardware failure and
software update cycles



Protection from...
Fire, power + cooling
disruption and flood



Protection from...
Tornado, earthquake and
other large scale disasters

Availability Sets



An availability set is a concept within a data centre that is made up of multiple fault domains and update domains. When you create an availability set, you can specify how many fault domains and update domains you want in that availability set.

Each virtual machine in your availability set is assigned an update domain and a fault domain by the underlying Azure platform. Each availability set can be configured with up to 3 fault domains and 20 update domains. These configurations can't be changed once the availability set has been created.

<https://learn.microsoft.com/en-us/azure/virtual-machines/availability-set-overview>

Update Domains and Fault Domains

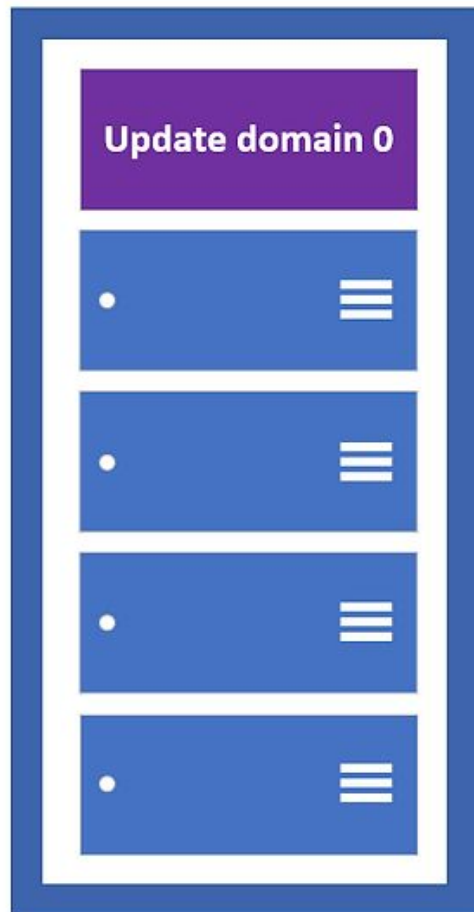


Update domains indicate groups of virtual machines and underlying physical hardware that can be rebooted at the same time.

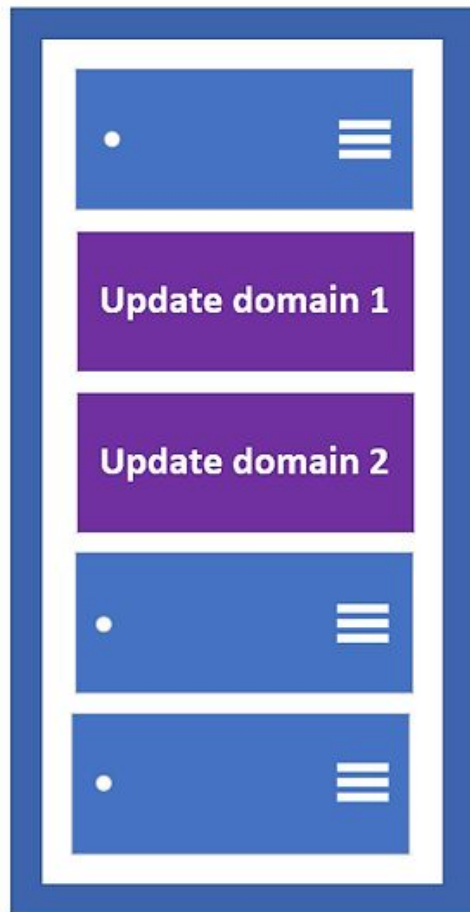
Fault domains define the group of virtual machines that share a common power source and network switch.

By default, the virtual machines configured within your availability set are separated across up to three fault domains.

Fault domain 0



Fault domain 1



Fault domain 2





Scaling:

- **Vertical Scaling:** Upgrade the VM size for more resources.
- **Horizontal Scaling:** Use Virtual Machine Scale Sets to manage multiple VMs.

Security Enhancements:

- **Azure Security Center:** Unified security management.
- **Azure Bastion:** Secure and seamless RDP and SSH access to VMs.

Horizontal Scaling

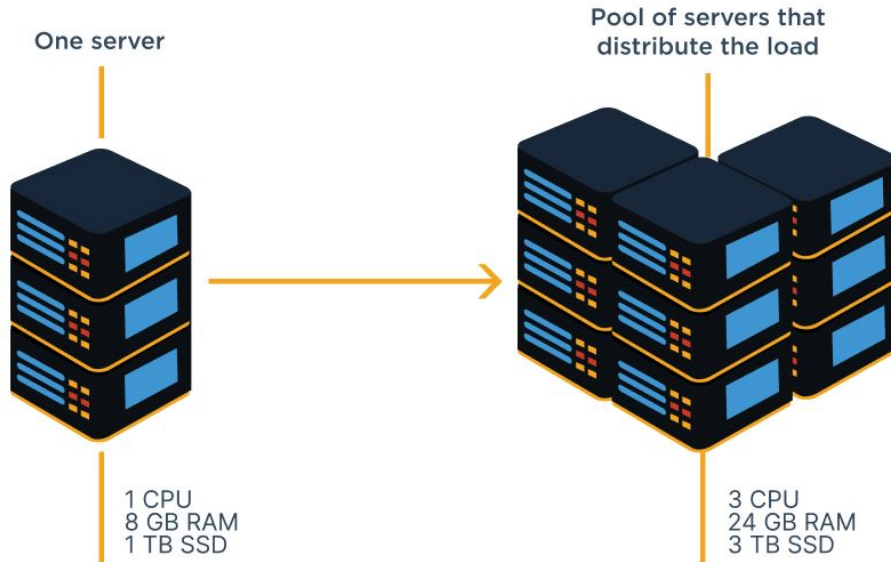


Horizontal scaling (aka scaling out) refers to adding additional machines to your infrastructure to cope with new demands.

If you are hosting an application on a server and find that it no longer has the capacity or capabilities to handle traffic, adding a server may be your solution.

Horizontal Scaling

(Add more same-size nodes)



Vertical Scaling



Vertical scaling (aka scaling up) describes adding additional resources to a system so that it meets demand.

Vertical scaling describes adding more power to your current machines. For instance, if your server requires more processing power, vertical scaling would mean upgrading the CPUs. You can also vertically scale the memory, storage, or network speed.

Additionally, vertical scaling may also describe replacing a server entirely or moving a server's workload to an upgraded one.

Vertical Scaling

(Improve or replace the existing server)



1 CPU
8 GB RAM
1 TB SSD



Dual-Core CPU
16 GB RAM
3 TB SSD



Quad-Core CPU
32 GB RAM
5 TB SSD

Summary



- Azure Virtual Machines provide flexible, scalable, and secure compute resources.
- Suitable for a wide range of applications and workloads.

Next Steps:

- Explore Azure documentation and tutorials.
- Deploy your first VM on Azure.

Resources:

- [Azure Virtual Machines Documentation](#)

Lab:



- Create a Windows Virtual Machine

Assignment



- Create a Windows 11 VM on Azure.
- Write a blog showing step by step details and screenshots on how you deployed and connect to the VM.

Submission Deadline:

- Friday.

Submission Link:

- https://docs.google.com/forms/d/e/1FAIpQLSdudtpDazMnOMpXhN-0yaq8DmXls7yUxwJi9t2ubV3VxAA28Q/viewform?usp=sf_link