



# AZ – 203 Developer Training

Introduction to Microsoft Azure



# Agenda



- ☐ What is Azure
- ☐ Azure Regions
- ☐ Which Azure region is right for me
- ☐ Azure Region Pairs
- ☐ Region Pairs Benefits
- ☐ Azure Availability Zones
- ☐ Azure Datacenters
- ☐ Azure Fault Domains
- ☐ Azure Upgrade Domains
- ☐ Azure Availability Set
- ☐ Azure Storage Availability
- ☐ Azure Services
- ☐ Azure Feature Availability
- ☐ Azure Subscription
- ☐ Azure Support Plans
- ☐ Azure Management tools
- ☐ Hands-On Lab
  - ☐ Create a Microsoft Azure Account
- ☐ Manage Azure subscriptions
  - ☐ Azure Administrator Subscription Management

# Introduction to Microsoft Azure

# What is Azure?

- ❑ Azure is a cloud offering from Microsoft that individuals and organizations can use to create, deploy, and operate cloud-based apps and infrastructure services.



**Open and Flexible  
Cloud Platform**



**Build, Deploy, and  
Manage  
Applications across  
Global Network**



**Build Applications  
using Any  
Language, Tool, or  
Framework**



**Integrate Public  
Cloud Applications  
with your Existing  
IT Environment**

# Azure Regions



# Azure Regions

- ❑ The Azure datacenters are located around the world in strategic places that best meets the customer demands.
- ❑ These areas are known as Azure regions and are placed at a distance from each other in case there is a natural disaster that would affect more than one region at a time.
- ❑ Azure operates out of 36\* regions around the world (with plans announced for 6\* additional regions).
- ❑ Geographic expansion is a priority for Azure because it enables the customers to achieve higher performance and it supports their requirements and preferences regarding data location.



# Which Azure region is right for me?



## Location

Where is your business located?  
Do you have branch offices or customers located in other countries



## Compliance needs

Do you or your customers have specific compliance requirements?



## Service availability

Are the Azure services you want available in the region you're considering?



## Data residency and sovereignty

Do you or your customers have specific data residency or sovereignty requirements?



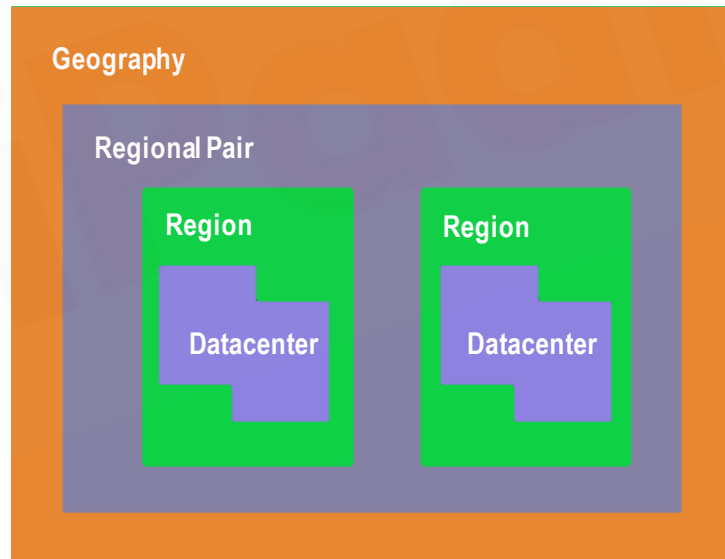
## Pricing

Is cost one of the most important factors in your decision?



# Azure Region Pairs

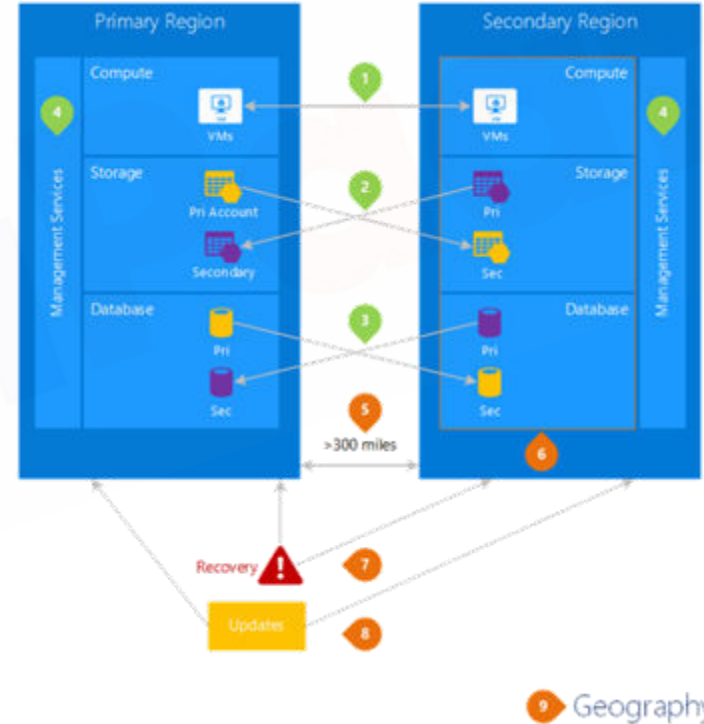
- ❑ An Azure geography is a defined area of the world that contains at least one Azure Region.
- ❑ An Azure region is an area within a geography, containing one or more datacenters.
- ❑ Each Azure region is paired with another region within the same geography (such as US, Europe, or Asia). This approach allows for the replication of resources.





# Region Pairs Benefits

- ❑ Figure shows a hypothetical application which uses the regional pair for disaster recovery.
- ❑ The green numbers highlight the cross-region activities of three Azure services (Azure compute, storage, and database) and how they are configured to replicate across regions.
- ❑ The unique benefits of deploying across paired regions are highlighted by the orange numbers.



# Region Pairs Benefits



## Physical isolation [5]

- When possible, Azure prefers at least 300 miles of separation between datacenters in a regional pair.
- Physical datacenter separation reduces the likelihood of natural disasters, civil unrest, power outages, or physical network outages affecting both regions at once.

## Platform-provided replication [6]

- Some services such as Geo-Redundant Storage provide automatic replication to the paired region.

## Region recovery order [7]

- In the event of a broad outage, recovery of one region is prioritized out of every pair.
- Applications that are deployed across paired regions are guaranteed to have one of the regions recovered with priority.

## Sequential updates [8]

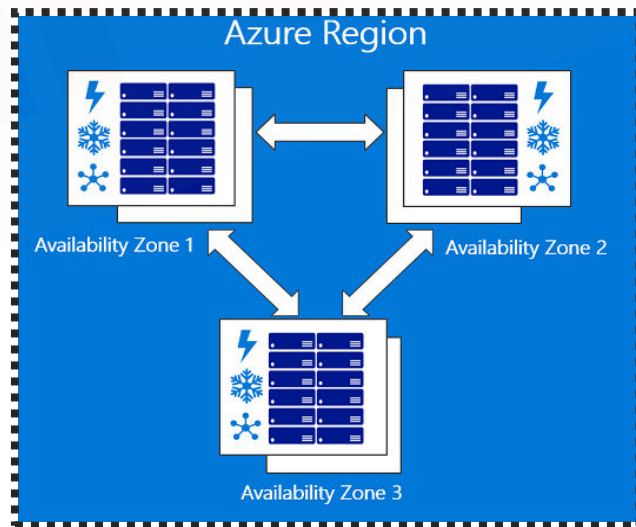
- Planned Azure system updates are rolled out to paired regions sequentially (not at the same time) to minimize downtime.

## Data residency [9]

- A region resides within the same geography as its pair in order to meet data residency requirements for tax and law enforcement jurisdiction purposes.

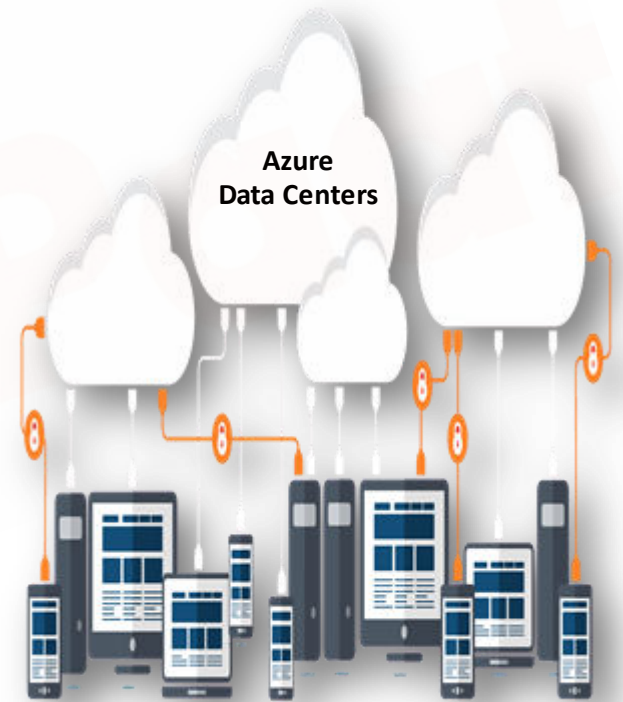
# Azure Availability Zones

- ❑ An Availability Zone is a physically separate zone within an Azure region.
- ❑ There are three Availability Zones per supported Azure region.
- ❑ Each Availability Zone has a distinct power source, network, and cooling, and is logically separate from the other Availability Zones within the Azure region.
- ❑ By architecting your solutions to use replicated VMs in zones, you can protect your apps and data from the loss of a datacenter.
- ❑ If one zone is compromised, then replicated apps and data are instantly available in another zone.
- ❑ Regions that support Availability Zones\*
  - East US 2
  - US Central
  - West Europe
  - France Central



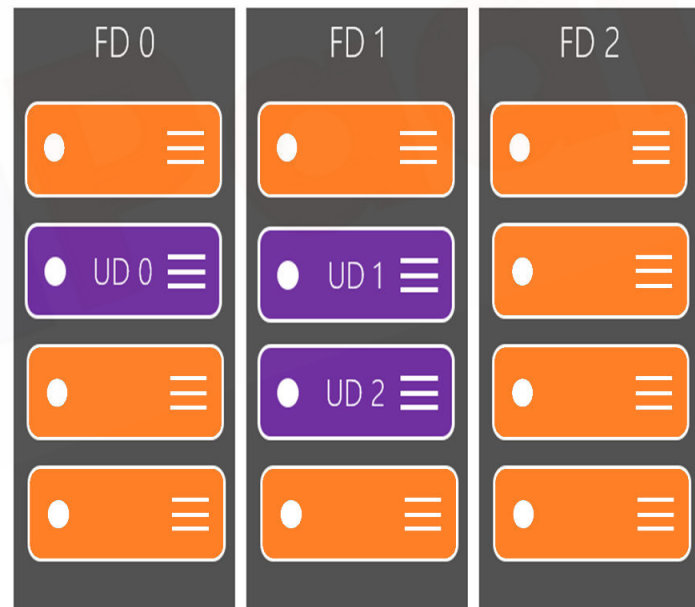
# Azure Datacenters

- ❑ Azure hosts its services in a series of globally distributed datacenters.
- ❑ These datacenters are located in a specific location and are grouped together in regions.
- ❑ Datacenters within a given region are divided into “clusters,” which host the Azure services.
- ❑ Within each datacenter, the racks of equipment are built to be fault tolerant on a networking, physical host servers, storage, and power level.
- ❑ The physical host servers are placed in high availability units called a cluster.
- ❑ Clusters are thousands of servers in pluggable units.



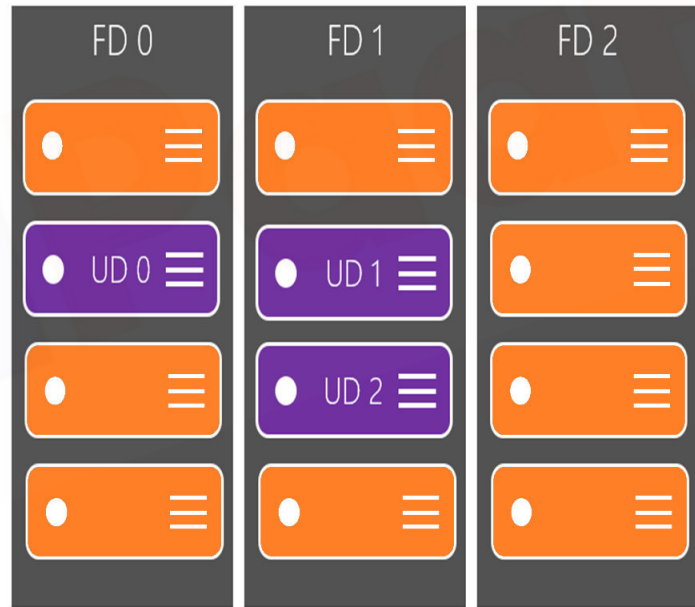
# Azure Fault Domains

- ❑ One single rack is referred to as a Fault Domain (FD).
- ❑ A Fault Domain is generally said to be a single point of source of failure.
- ❑ FDs 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 two FDs.
- ❑ A service owner can not control the allocation of a fault domain.



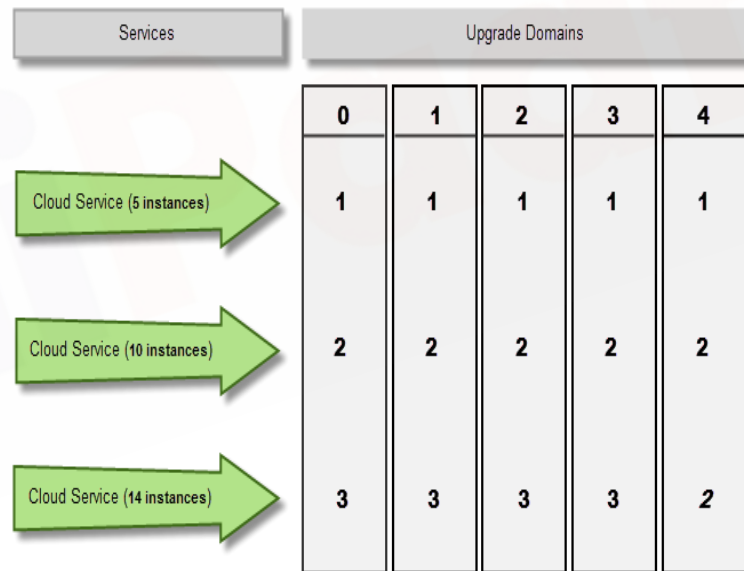
# Azure Upgrade Domains

- ❑ Upgrade domains define a logical unit of deployment for an application.
- ❑ Windows Azure when possible will distribute instances evenly into multiple upgrade domains with each upgrade domain as a logical unit of a deployment.
- ❑ When upgrading a deployment, it is then carried out one upgrade domain at a time.
- ❑ By stopping only the instances running within one upgrade domain, Windows Azure ensures that an upgrade takes place with the least possible impact to the running service.
- ❑ The default number of upgrade domains is 5 and the maximum is 20.



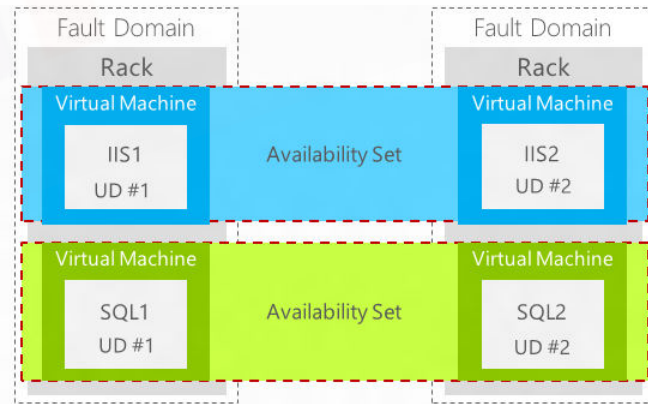
# Azure Upgrade Domains

- ❑ Windows Azure distributes instances of a role evenly (when possible) across a set number of upgrade domains.
- ❑ Note that a service instance allocation to a particular upgrade domain is determined by Windows Azure at deployment time and it cannot be controlled by the service owner.
- ❑ Note that number of upgrade domains does not have to equal to number of fault domains so a single application could easily exist in several upgrade domains but only deployed to two separate fault domains.



# Azure Availability Set

- ❑ Availability Sets are used within Microsoft Azure to ensure that virtual machines are deployed into different Fault Domains.
- ❑ Azure ensures that the VMs you place within an Availability Set run across multiple physical servers, compute racks, storage units, and network switches.
- ❑ If a hardware or Azure software failure occurs, only a subset of your VMs are impacted, and your overall application stays up and continues to be available to your customers.
- ❑ The following diagram shows two availability sets with two virtual machines in each set.
- ❑ A maximum of 100 VM can reside in an Availability Set.
- ❑ This allows Microsoft Azure to provide an SLA of 99.95% for the service provided by the virtual machines within the availability set.





# Azure Storage Availability



You can choose different replication options:

## Locally Redundant Storage (LRS)

- Replicates your data three times within the region in which you created your storage account.

## Zone Redundant Storage (ZRS)

- Replicates your data three times across two to three facilities, either within a single region or across two regions.








## Geo-Redundant Storage (GRS)

- Replicates your data to a secondary region that is hundreds of miles away from the primary region.








## Read-Access Geo-Redundant Storage (RA-GRS)

- Replicates your data to a secondary region, as with GRS, but also then provides read-only access to the data in the secondary location.









### Web & Mobile

 Web Apps	 Mobile Apps
 Logic Apps	 API Apps
 Content Delivery Network	 Media Services
 Search	






### Internet of Things & Enterprise Integration

 Azure IoT Hub	 Event Hubs
 Stream Analytics	 Notification Hubs
 BizTalk Services	 Service Bus
 Data Catalog	







### Compute

 Virtual Machines	 Virtual Machine Scale Sets
 Azure Container Service	 Azure Container Registry
 Functions	 Batch
 Service Fabric	 Cloud Services








### Storage

 Storage: Blobs, Tables, Queues, Files, Disks	 Data Lake Store
 StorSimple	 Azure Backup
 Site Recovery	









### Databases

 SQL Database	 SQL Data Warehouse
 SQL Server Stretch Database	 DocumentDB
 Redis Cache	 Data Factory








### Developer Services

 Visual Studio Team Services	 Azure DevTest Labs
 VS Application Insights	 API Management
 HockeyApp	 Developer Tools
 Service Profiler*	







### Networking

 Virtual Network	 Load Balancer
 Application Gateway	 VPN Gateway
 Azure DNS	 Traffic Manager
 ExpressRoute	 Network Watcher

### Intelligence & Analytics

 HDInsight	 Machine Learning
 Cognitive Services	 Azure Bot Service*
 Data Lake Analytics	 Power BI Embedded
 Azure Analysis Services	

### Monitoring & Management

 Azure Portal	 Azure Resource Manager	 Azure Advisor	 Azure Monitor	 Log Analytics	 Automation	 Scheduler
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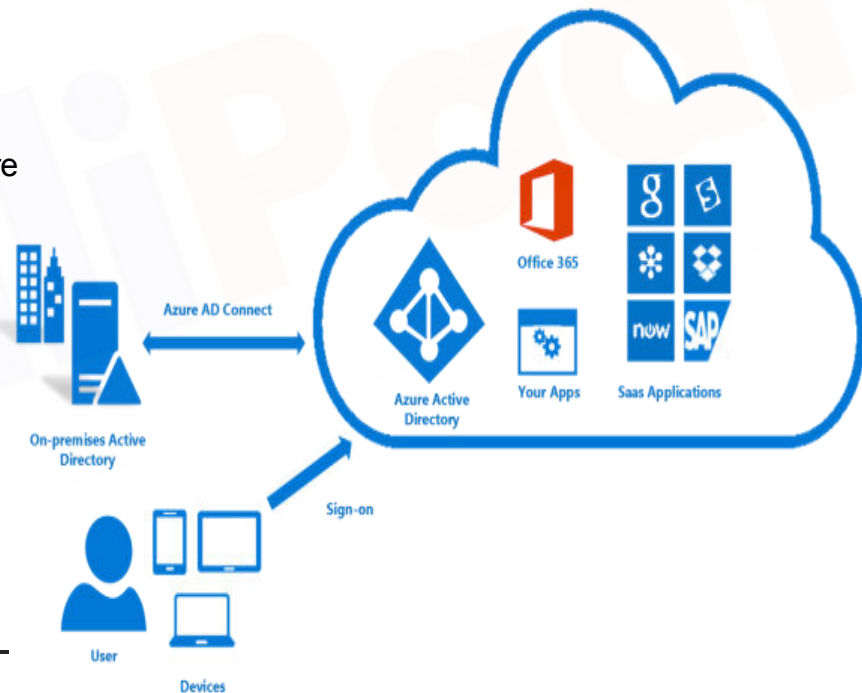
# Azure Services

# Azure Feature Availability

- ❑ Some services or VM features are only available in certain regions, such as specific VM sizes or storage types.

- ❑ There are also some global Azure services that do not require you to select a particular region, such as:

- Azure Active Directory
- Traffic Manager
- Azure DNS



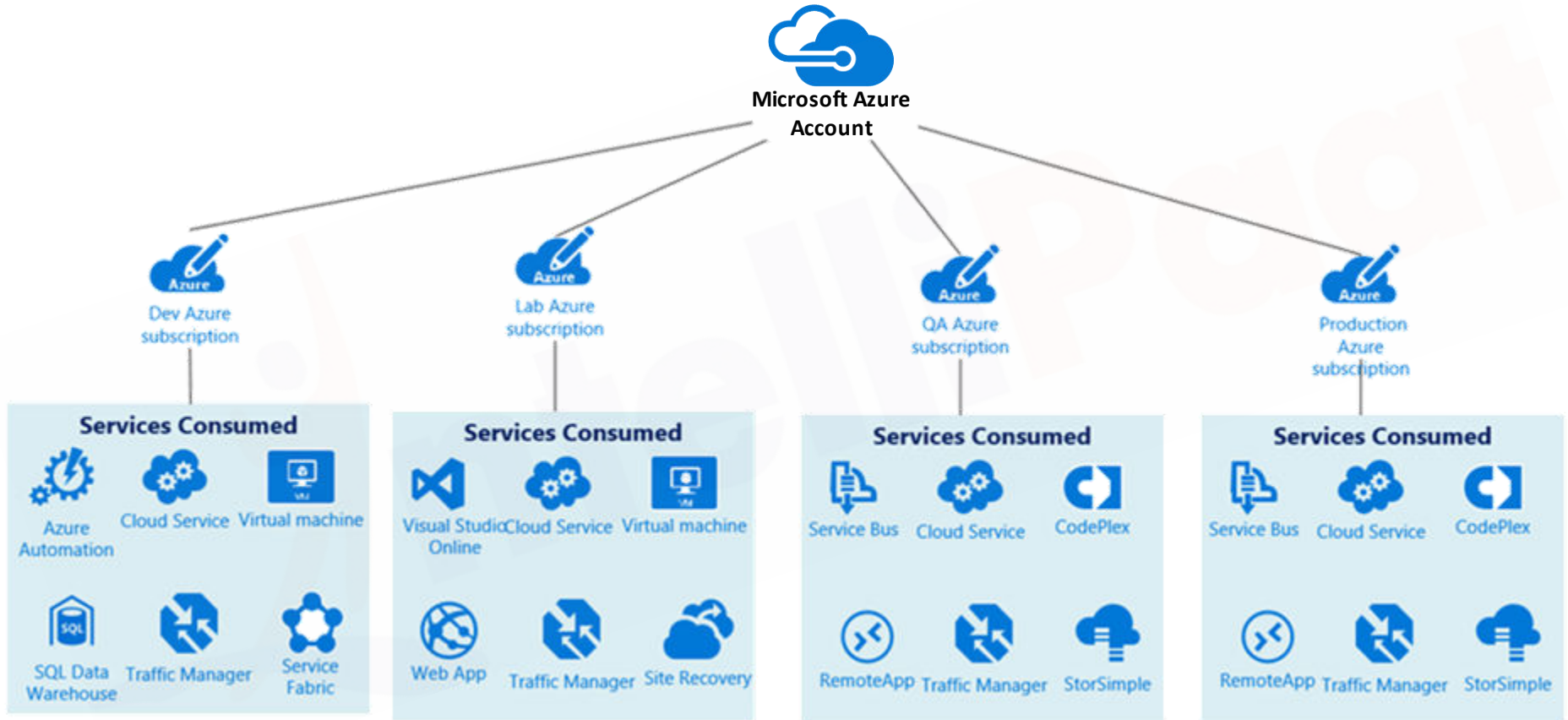
- ❑ URL <https://azure.microsoft.com/en-us/regions/services/>

# Azure Subscription



- ❑ A Windows Azure subscription has two aspects:
  - The Windows Azure account, through which resource usage is reported and services are billed.
- ❑ Each subscription also is subject to quotas, which determine the maximum quantity of services and resources that can reside in the same subscription.
- ❑ These limits typically apply on per-subscription and per-region levels.
- ❑ All cloud services belongs to Subscription.
- ❑ Each Subscription have an ID.
  - <https://account.azure.com>
- ❑ Let's relate this concept with real world.
  - We created separate subscription for Dev , Test and Production environment.

# Azure Subscription

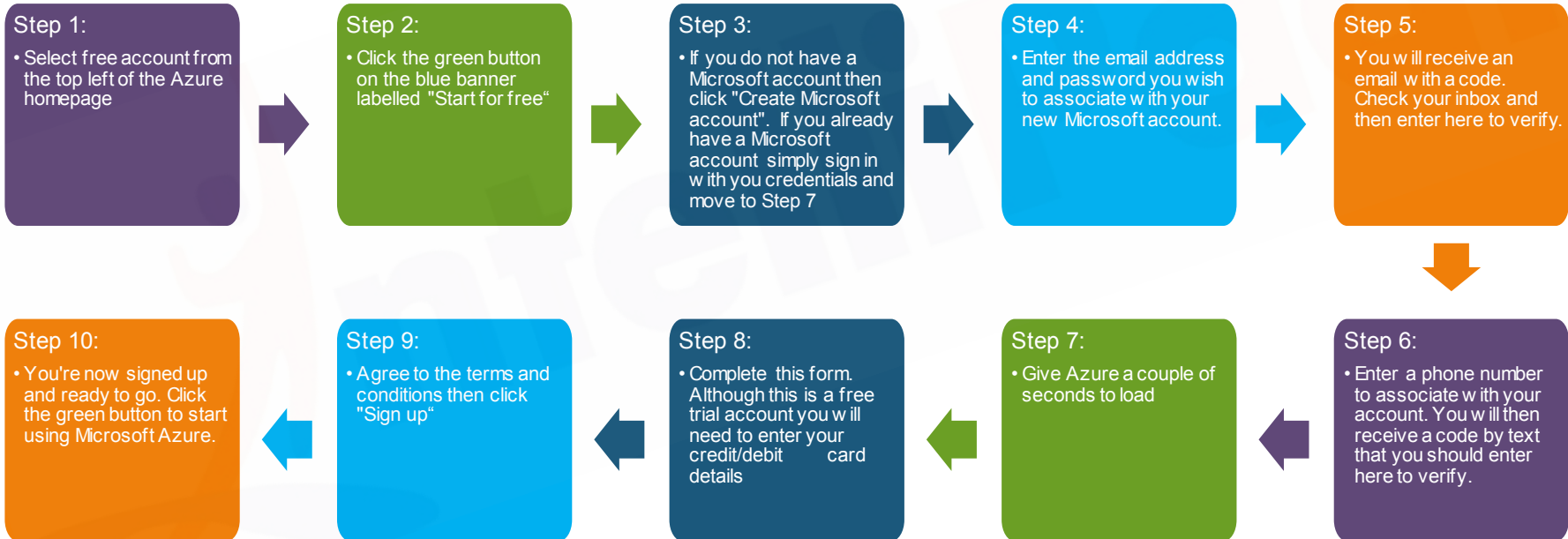


# Manage Azure Subscriptions

# How to Create a Microsoft Azure Account?



Link <https://azure.microsoft.com>



# Add or change Azure Subscription Administrators



## Add an RBAC Owner for a subscription in Azure portal

To add someone as an administrator for an Azure subscription, assign them the Owner role (an RBAC role) at the subscription scope. The Owner role can manage the resources in the subscription that you assigned and doesn't have access privilege to other subscriptions.

1. Visit Subscriptions in Azure portal.
2. Select the subscription that you want to give access.
3. Select Access control (IAM) in the list.
4. Select Add role assignment. **If the Add role assignment button is missing, you do not have permission to add permissions.)**
5. (In the Role box, select Owner.
6. In the Assign access to box, select Azure AD user, group, or service principal.
7. In the Select box, type the email address of the user you want to add as Owner. Select the user, and then select Save **(As shown in the image).**

A screenshot of the 'Add role assignment' dialog box in the Azure portal. The dialog has a title bar with a close button (X). It contains three dropdown menus: 'Role' with 'Owner' selected, 'Assign access to' with 'Azure AD user, group, or service principal' selected, and 'Select' with 'user@contoso.com' entered. Below these is a 'Selected members' section showing a red circular icon with 'US' and the text 'user user@contoso.com', with a 'Remove' link to its right. At the bottom are 'Save' and 'Discard' buttons.


**Add role assignment** [X]

Role ⓘ  
Owner [v]

Assign access to ⓘ  
Azure AD user, group, or service principal [v]

Select ⓘ  
user@contoso.com

Selected members:

 user  
user@contoso.com [Remove](#)

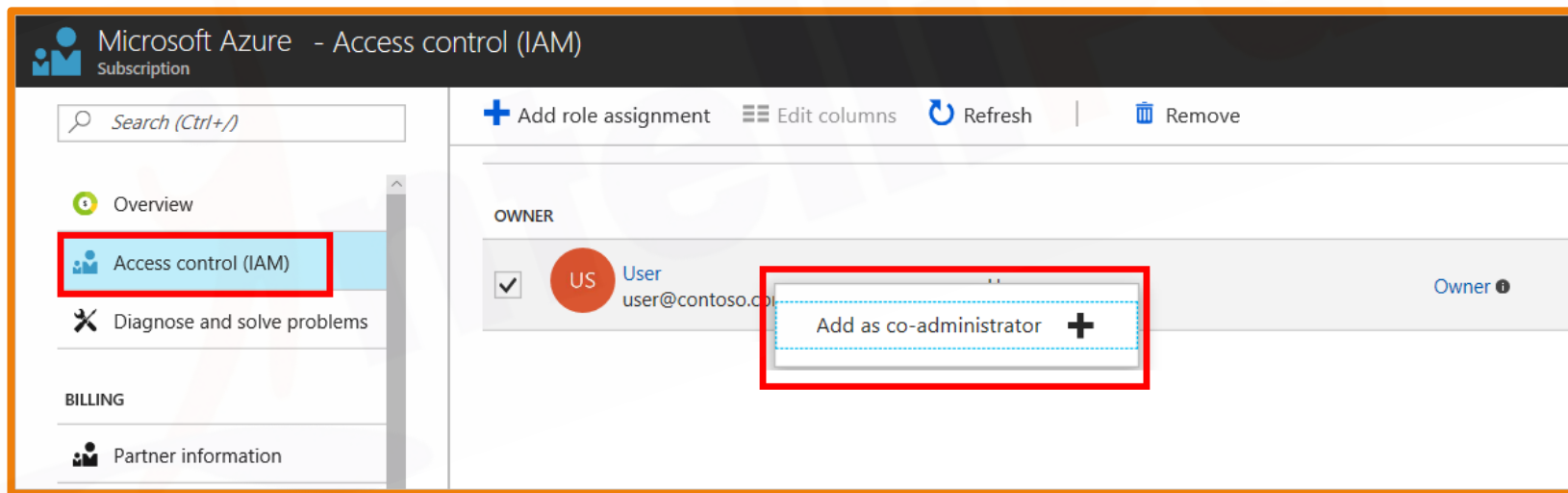
[Save](#) [Discard](#)



# Add or change Co-administrator

**Only an Owner can be added as a Co-administrator. Other users with roles such as Contributor and Reader cannot be added as Co-administrators.**

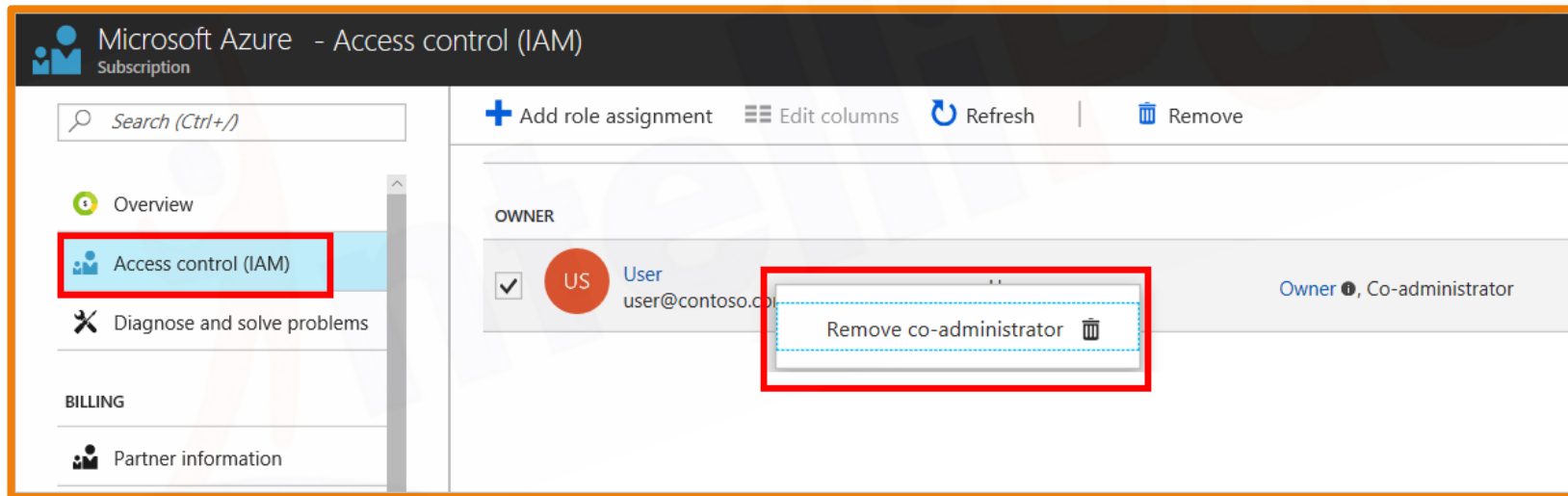
- ❑ Right-click the Owner user you just added, and then select Add as co-administrator. If you do not see the Add as co-administrator option, refresh the page or try another Internet browser.



The screenshot displays the Microsoft Azure portal's Access control (IAM) section. On the left, the navigation pane includes 'Overview', 'Access control (IAM)' (highlighted with a red box), 'Diagnose and solve problems', 'BILLING', and 'Partner information'. The main content area shows a table of role assignments under the heading 'OWNER'. A single user is listed with a checkmark in the first column, a red circle with 'US' in the second, 'User' and 'user@contoso.co' in the third, and 'Owner' in the fourth. A context menu is open over the user row, with the 'Add as co-administrator' option highlighted by a red box.

# Add or change Co-administrator

To remove the Co-administrator permission, right-click the Co-administrator user and then select Remove co-administrator.



Microsoft Azure - Access control (IAM)

Subscription

Search (Ctrl+/)

Overview

Access control (IAM)


Diagnose and solve problems

BILLING

Partner information

+ Add role assignment Edit columns Refresh Remove

OWNER

<input checked="" type="checkbox"/>	 User user@contoso.com	Owner, Co-administrator
-------------------------------------	--	-------------------------

Remove co-administrator

# Change the Service administrator for an Azure subscription



Only the Account administrator can change the Service administrator for a subscription. By default, when you sign up, the Service administrator is the same as the Account administrator. If the Service administrator is changed to a different user, then the Account administrator loses access to Azure portal. However, the Account administrator can always use Account Center to change the Service administrator back to themselves.

1. Make sure your scenario is supported by checking the limits for changing Service administrators.
2. Sign in to Account Center as the Account administrator.
3. Select a subscription.
4. On the right side, select Edit subscription details.
5. In the SERVICE ADMINISTRATOR box, enter the email address of the new Service administrator

DATE PURCHASED  
12/3/2014

CURRENT BILLING PERIOD  
9/3/2015 - 10/2/2015

- Download usage details
- Contact Microsoft Support
- Edit subscription details**
- Change subscription address
- Partner Information
- Cancel Subscription

EDIT YOUR SUBSCRIPTION

Make it yours

Personalize your subscriptions to keep them organized. [Privacy & Cookies](#)

SUBSCRIPTION NAME  
Visual Studio Ultimate with MSDN

**SERVICE ADMINISTRATOR**  
tom@contoso.com

# Azure Support Plans



## Developer

- The Developer plan is designed for test or nonproduction environments.
- It includes technical support for Azure during business hours with an initial response time of **less than eight hours**.

## Standard

- The Standard plan offers the same features as the Developer plan, and the initial response time is **less than two hours**.

## Professional Direct

- This plan is designed for organizations that depend on Azure for business-critical apps or services.
- It includes the same features as the Standard plan in addition to basic advisory services, pooled support account management, escalation management, and an initial response time of **less than one hour**.

## Premier

- This is the highest level of support, and it extends to all Microsoft products, including Azure.
- With Premier, you receive customer-specific advisory services, a dedicated support account manager and a response time of less than **15 minutes**, in addition to all the Professional Direct features.

# Azure Management Tools



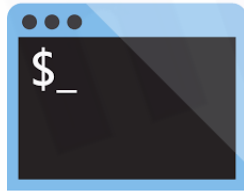
**Azure Portals**



**Windows PowerShell**



**Azure Automation**



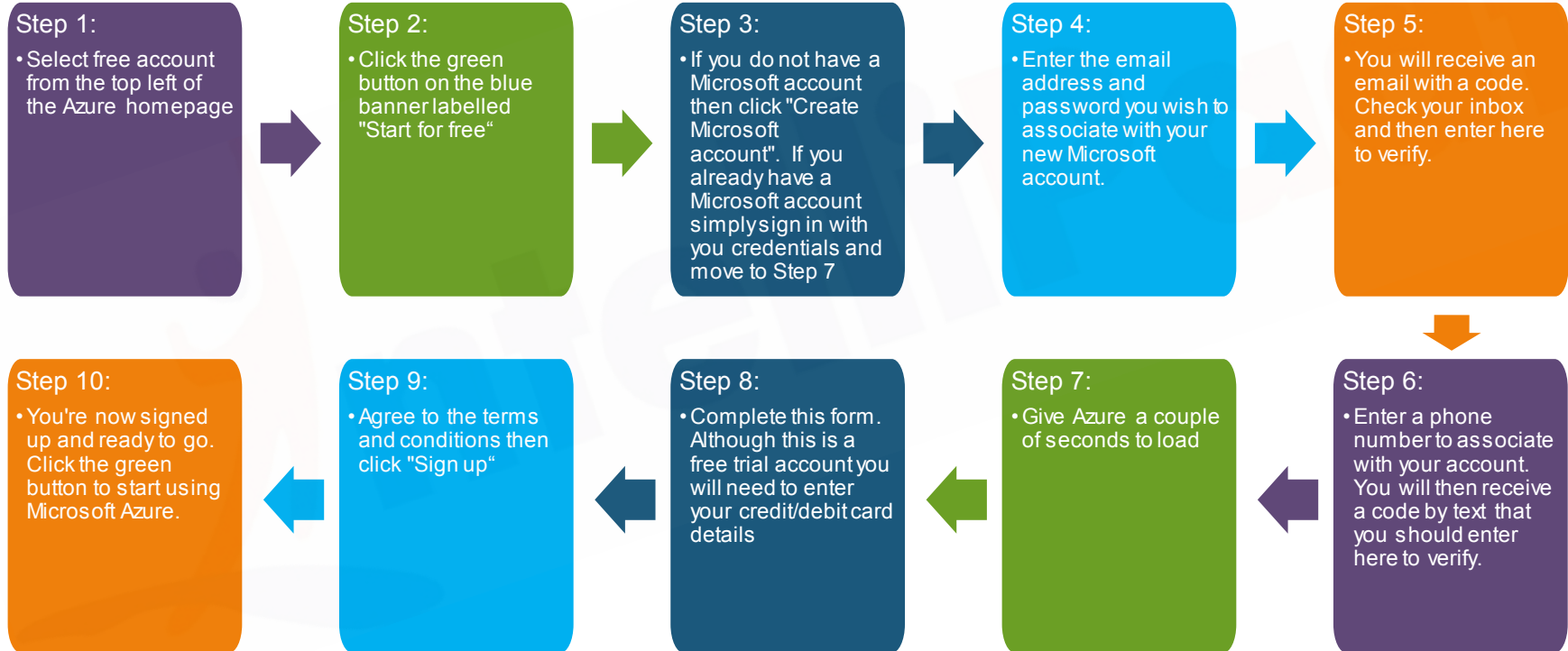
**Azure CLI**



**Visual Studio**

# Hands-On Lab

# How to Create a Microsoft Azure Account?



# QUIZ



# Quiz 1

## What are azure regions?

**A**

The only regions where Azure can be used, and can't be used anywhere

**B**

Regions where Azure is cheaper than non-azure regions

**C**

The datacenters located around the world in strategic places that best meets the customer demands.

**D**

Regions where Azure cloud works fast



# Answer 1

## What are azure regions?

**A**

The only regions where Azure can be used, and can't be used anywhere

**B**

Regions where Azure is cheaper than non-azure regions

**C**

The datacenters located around the world in strategic places that best meets the customer demands.

**D**

Regions where Azure cloud works fast



# Quiz 2

## What are azure regions?

**A**

The only regions where Azure can be used, and can't be used anywhere

**B**

Regions where Azure is cheaper than non-azure regions

**C**

The datacenters located around the world in strategic places that best meets the customer demands.

**D**

Regions where Azure cloud works fast



# Answer 2

## What are azure regions?

**A**

The only regions where Azure can be used, and can't be used anywhere

**B**

Regions where Azure is cheaper than non-azure regions

**C**

The datacenters located around the world in strategic places that best meets the customer demands.

**D**

Regions where Azure cloud works fast



# Quiz 3

Do scale sets work with Azure availability sets?

A

Yes

B

No



# Answer 3

Do scale sets work with Azure availability sets?

A

Yes

B

No



# Quiz 4

Which one of them is Azure Management tool?

- A** Azure DNS
- B** Azure Monitor
- C** Azure Virtual Machine
- D** Azure Migrate



# Answer 4

Which one of them is Azure Management tool?

**A**

Azure DNS

**B**

Azure Monitor

**C**

Azure Virtual Machine

**D**

Azure Migrate





# Quiz 5

Which one of them is Azure Activity Log?

- A** Provides logs of azure used all across the globe
- B** Provides insights into subscription-level events that have occurred in Azure
- C** Gives you alerts on excessive usage of resources
- D** Provision resources for you



# Answer 5

Which one of them is Azure Activity Log?

**A**

Provides logs of azure used all across the globe

**B**

Provides insights into subscription-level events that have occurred in Azure

**C**

Gives you alerts on excessive usage of resources

**D**

Provision resources for you





**India : +91-7847955955**

**US : 1-800-216-8930 (TOLL FREE)**



**[sales@intellipaate.com](mailto:sales@intellipaate.com)**



**24X7 Chat with our Course Advisor**