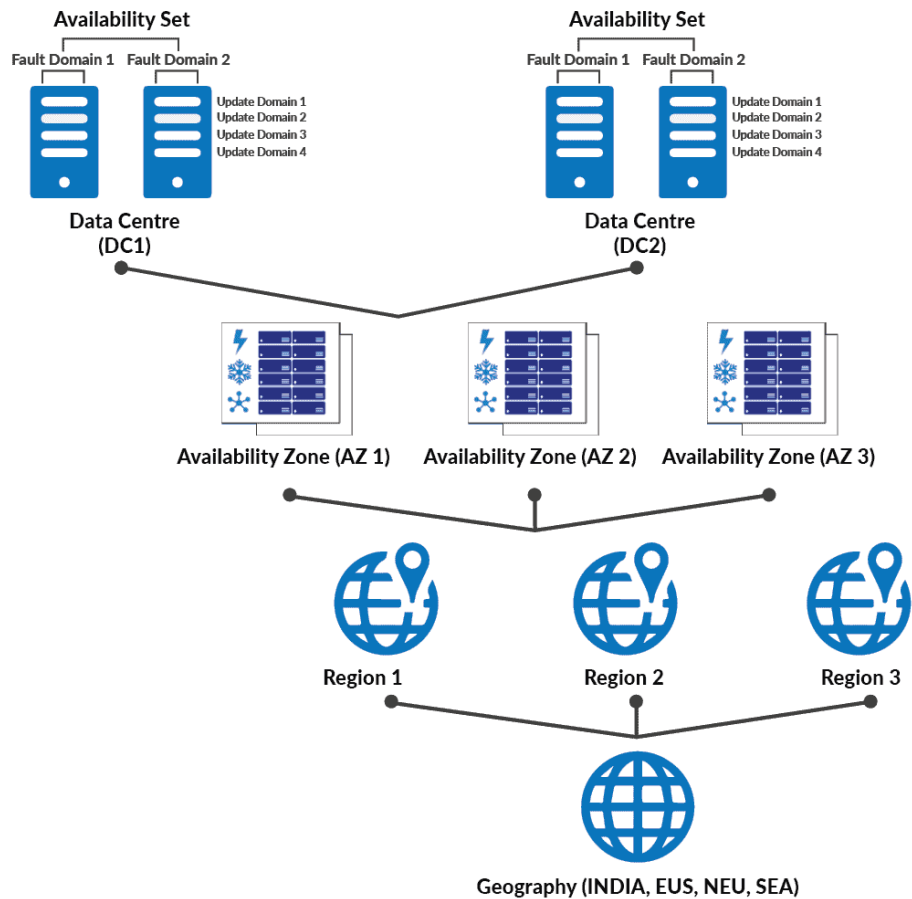


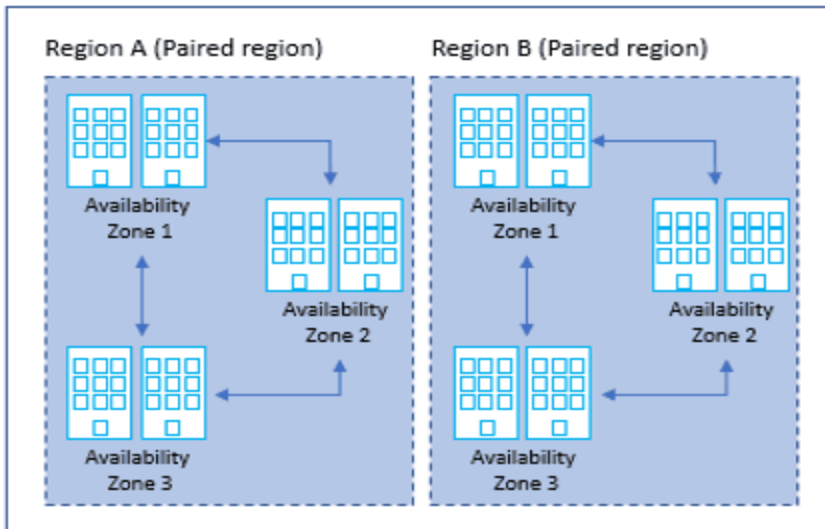
Architecture of the Azure



Region Pairs

- Each Azure region pairs with another region within the same geography, together making a regional pair.
- Azure serializes platform updates so only one region is updated at a time.
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Data Residency Boundary (Azure Regional Pairs in geography)



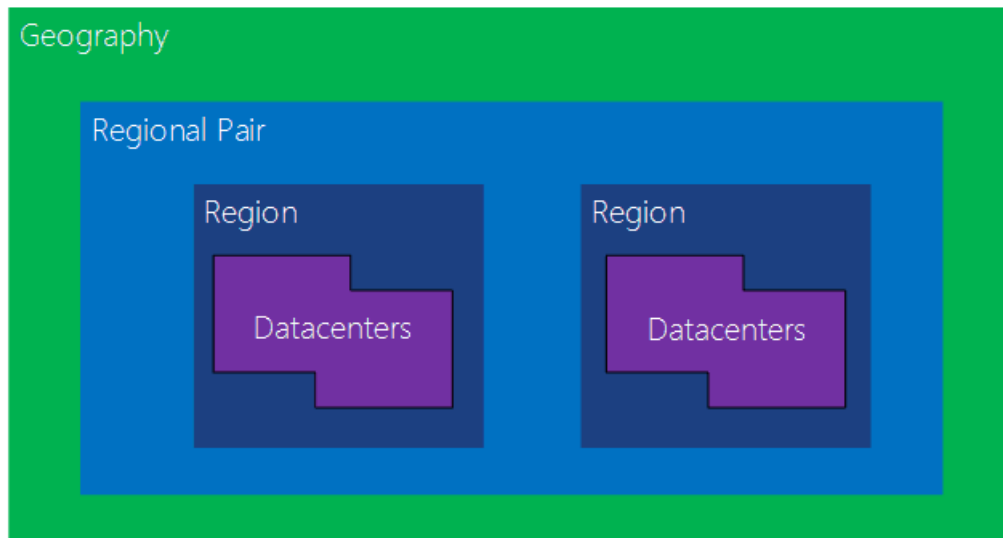
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West US	East US
North Europe	West Europe
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Examples of region pairs

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[Home](#) / [Microsoft Azure](#) / [AZ-303](#) / [AZ-104] Region, Azure Availability Zone, Availability Sets, Fault Domain and Update Domain In Azure

[AZ-104] Region, Azure Availability Zone, Availability Sets, Fault Domain and Update Domain In Azure



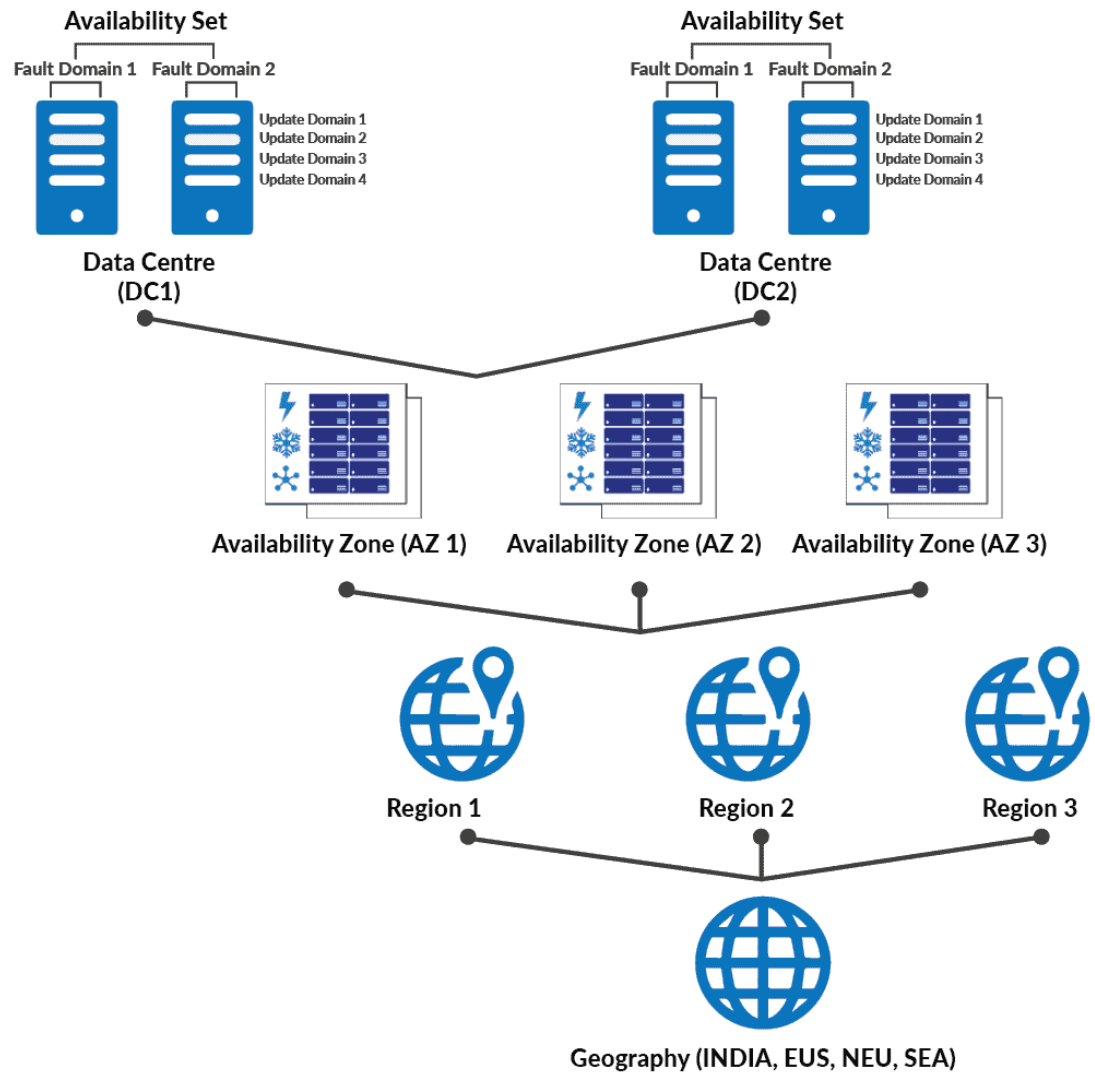
September 10, 2020 by [Atul Kumar](#) [2 Comments](#)
15398 views

In this video-blog, we are about to cover **Microsoft Azure's** most important concepts like **Azure Availability Zones, Region, Availability Set, Fault Domain, and Update Domain In Azure**, and how it plays a key role in Virtual Machines.

Note: Also read our previous blog on **What is [Resource Group](#)** and How to **Create Resource Group**.



The basic **Architecture** of the Azure can easily be understood by the following diagram



Region

A region is a set of data centers deployed within a latency-defined perimeter and connected through a dedicated regional low-latency network.

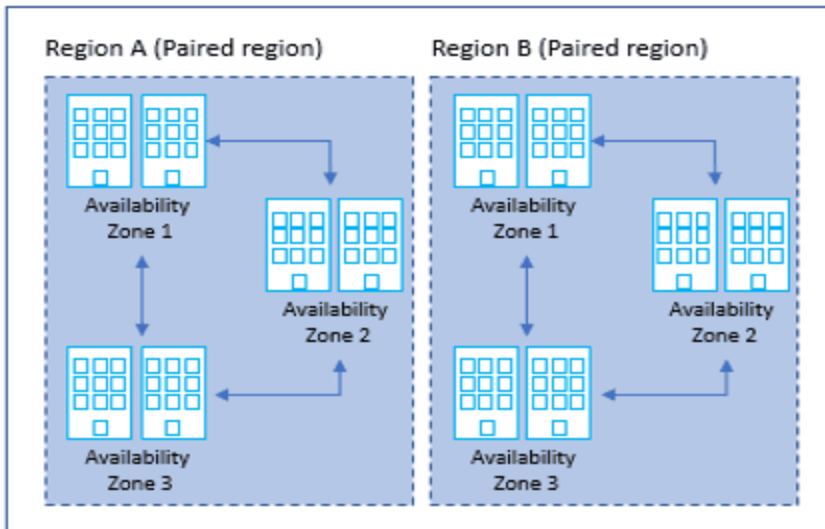
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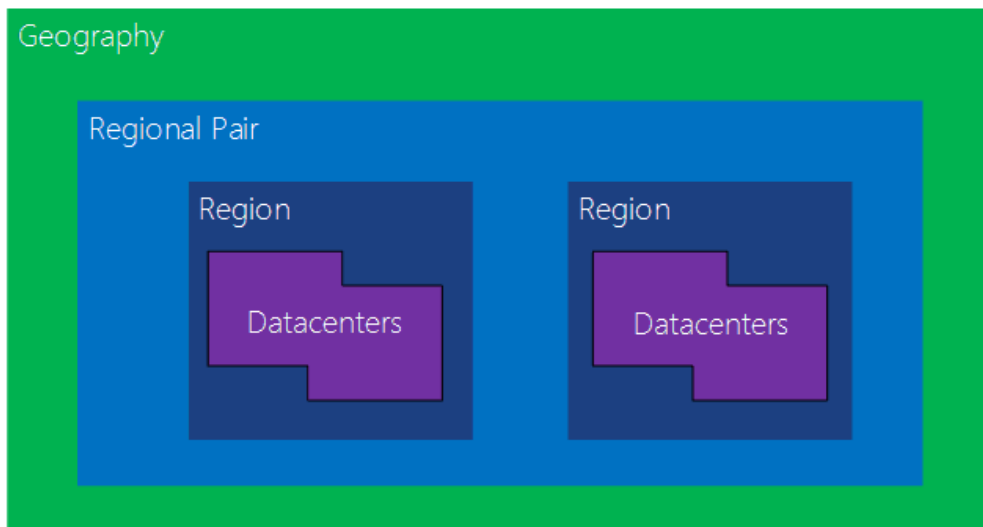
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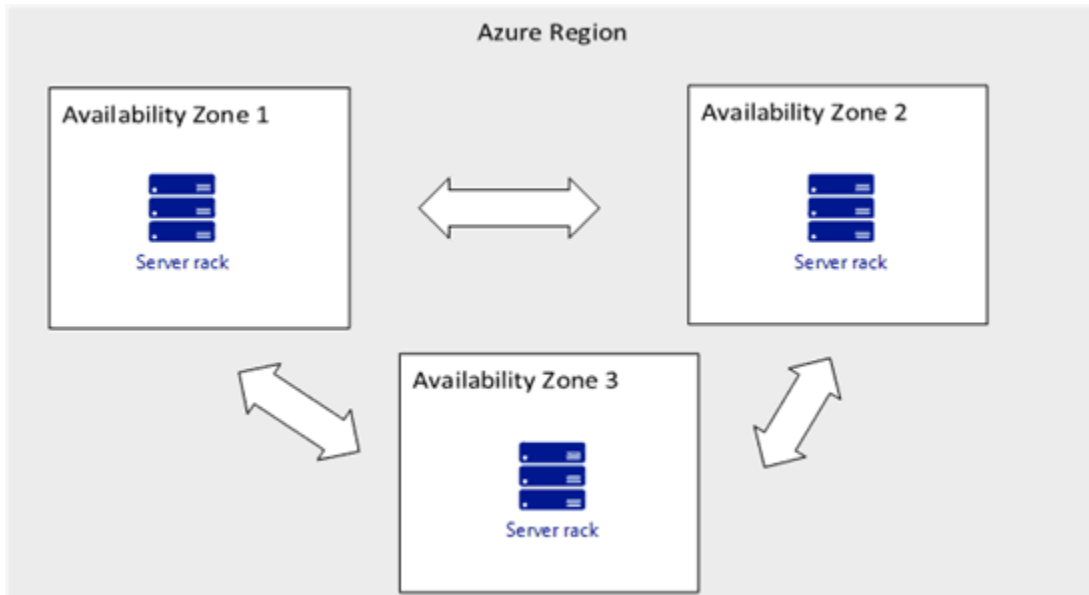
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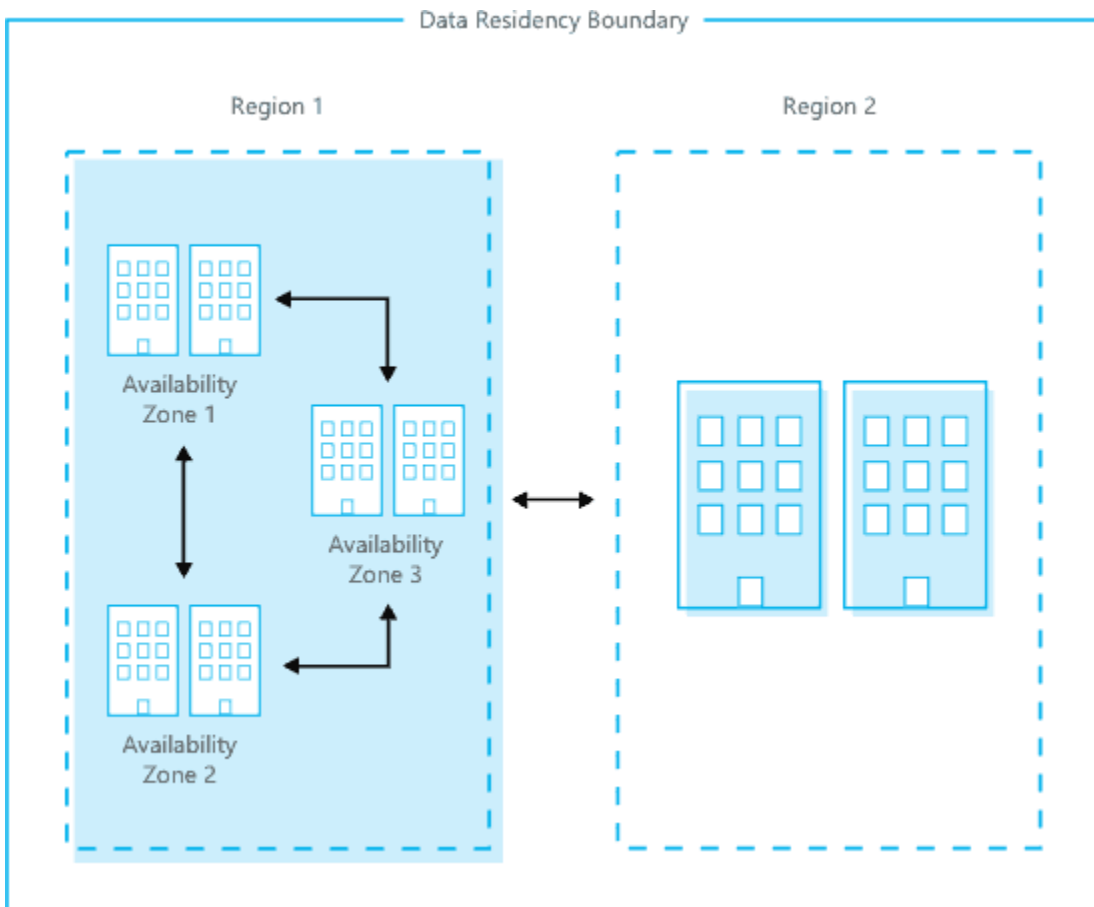


Availability Zone

- Azure Availability Zones is a high-availability offering that protects your applications and data from datacenter failures.
- These are unique physical locations within an Azure region. Each zone is made up of one or more data centers equipped with independent **power, cooling, and networking**.
- The physical separation of Availability Zones within a region protects applications and data from datacenter failures.
- **Zone-redundant** services replicate your applications and data across Azure Zones to protect from single-points-of-failure.
- **Not every region has support for Availability Zone Azure.** The **examples of Availability Zones** are Central US, East US 2, West US 2, West Europe, France Central, North Europe & Southeast Asia
- With **Availability Zones**, **Azure** offers industry best 99.99% VM uptime **SLA(Service Level Agreement)**



To achieve comprehensive business continuity on Azure, build your application architecture using the combination of Azure Zones with Azure region pairs.



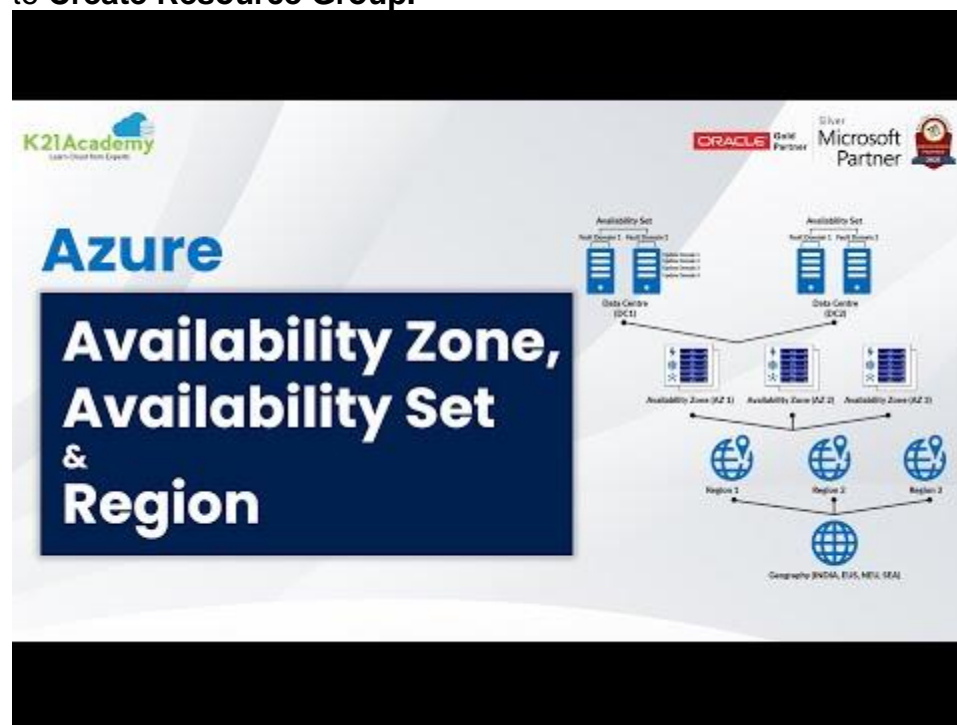
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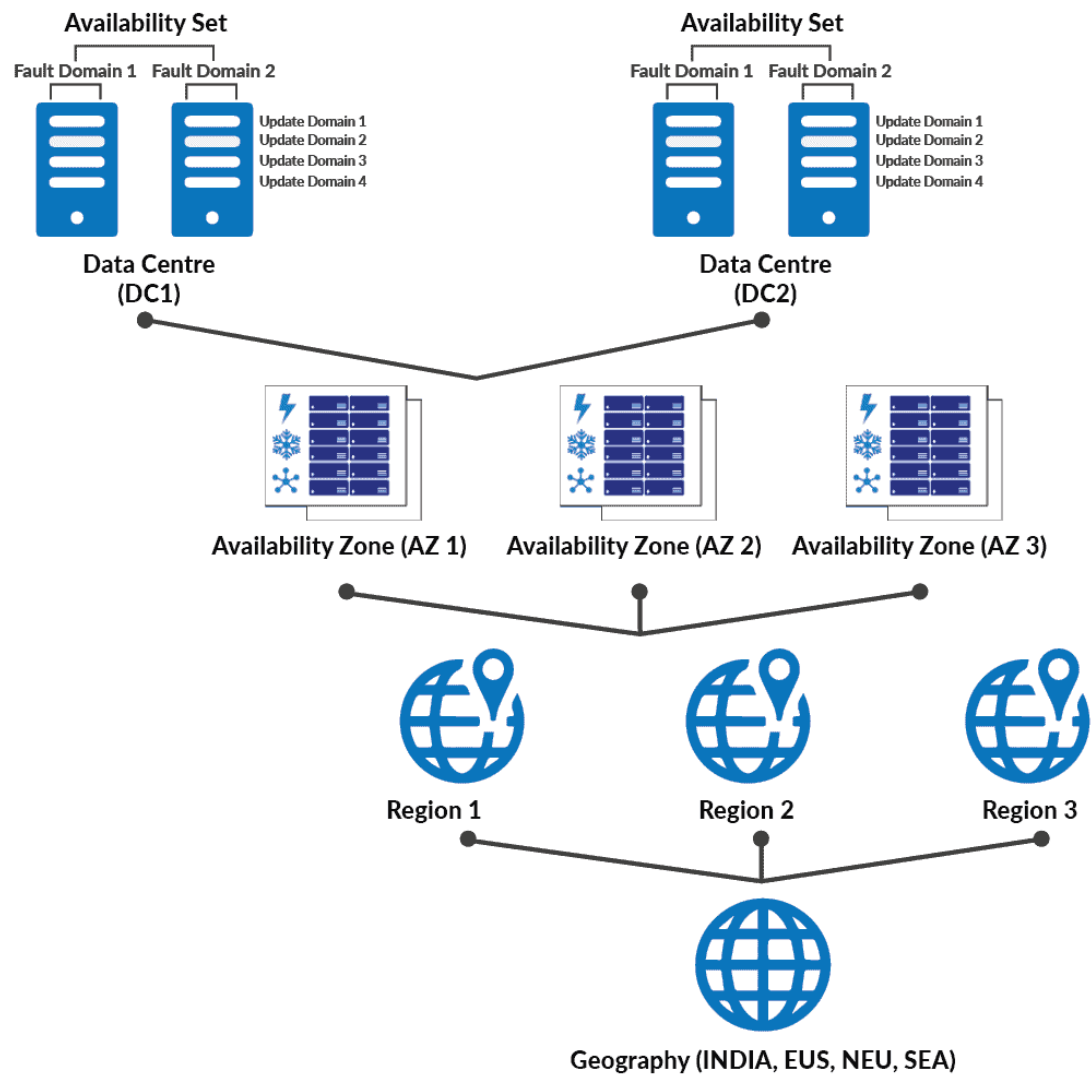
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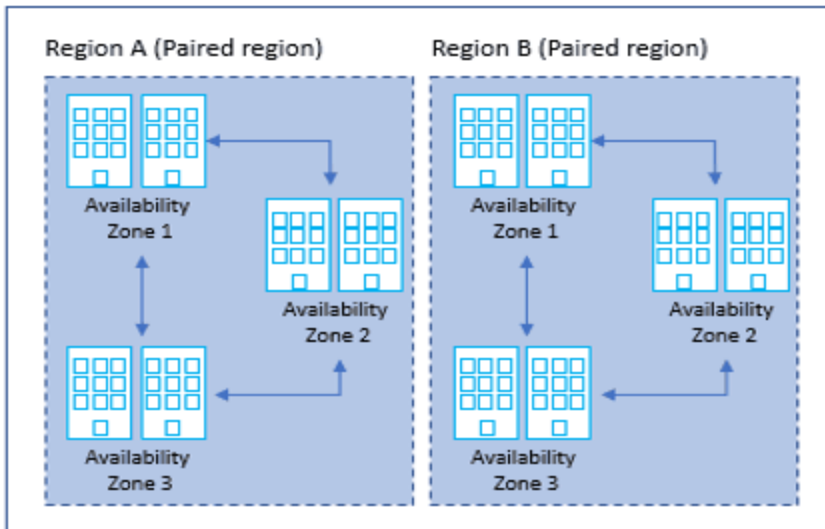


Also read: Everything you need to know on [Azure SQL Database](#)

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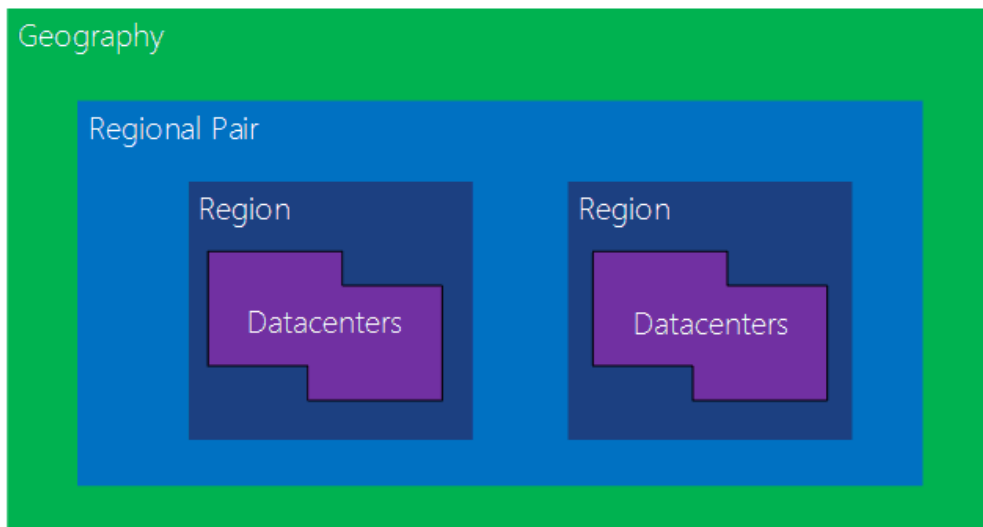
Also check: Steps to register [Azure Free Account](#)

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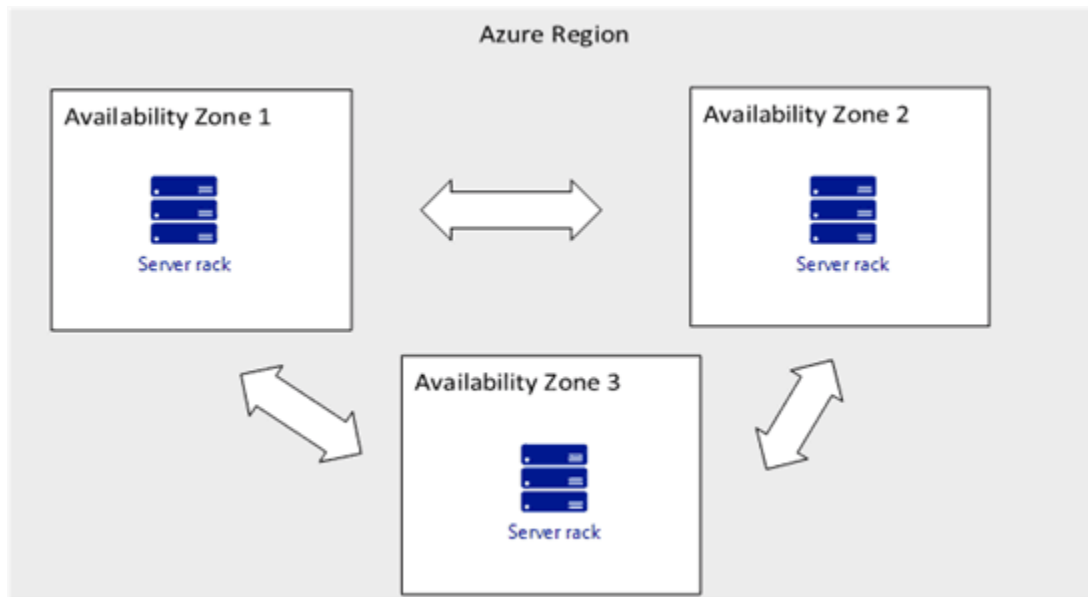
To know more about the Geography locations [refer here](#)



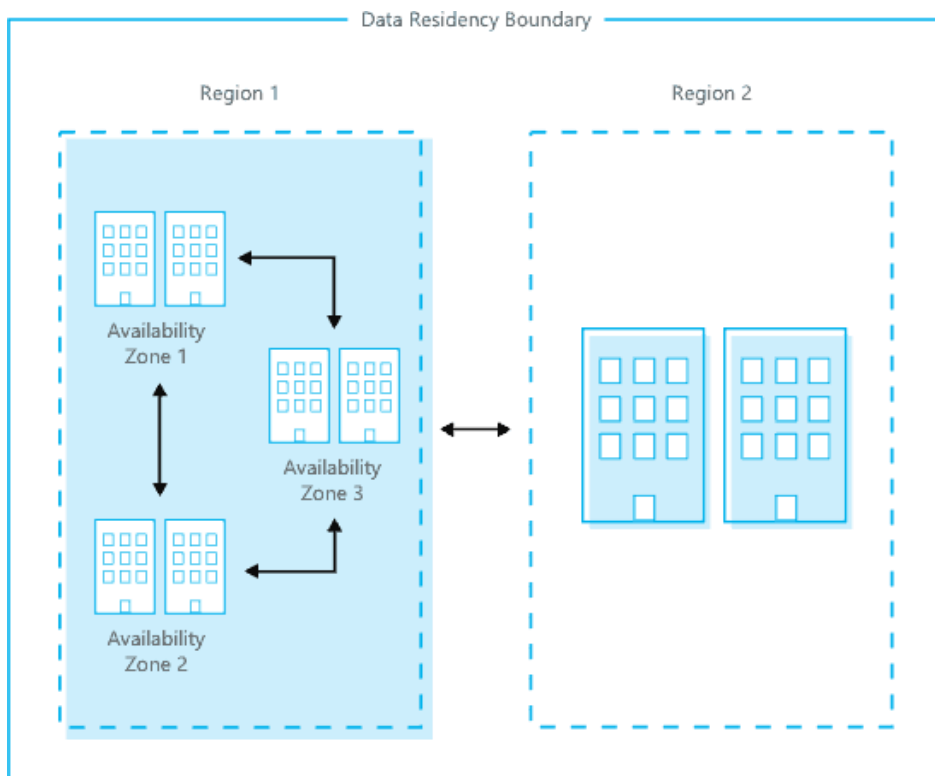
Also check: Step by Step instructions to install [Azure Powershell](#) module

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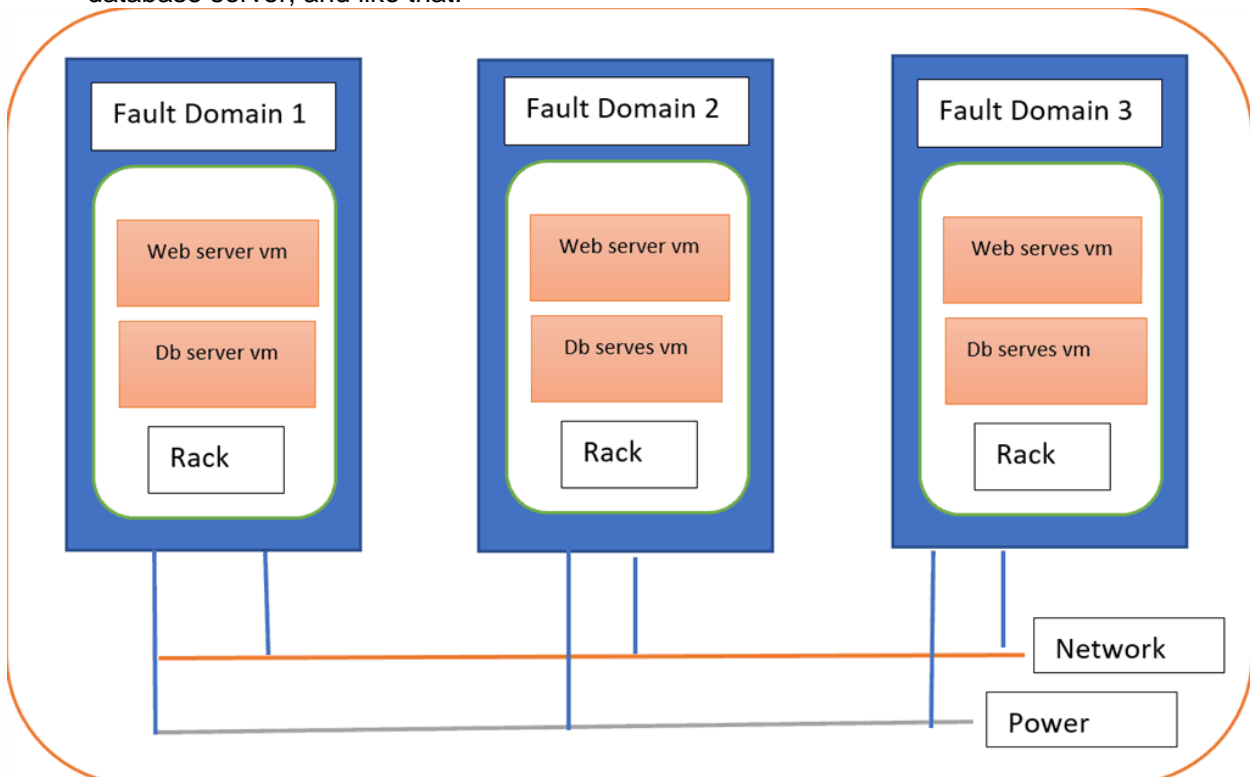
Availability Set

- An Availability Set is a logical grouping capability for isolating VM resources from each other when they're deployed.
- By deploying your VMs across multiple hardware nodes Azure ensures that if hardware or software failure happens within Azure, only a sub-set of your virtual machines is impacted and your overall solution is safe and in working condition.
- It provides redundancy for your virtual machines.
- An Availability set spreads your virtual machines across multiple **fault domains** and **update domains**.
- If you want to leverage Microsoft's 99.95% SLA from Microsoft you must place your VMs inside availability set except your VMs are having premium storage.

An **Update Domain** and **Fault Domain** is assigned to each VM in Availability Set by Azure platform.

Fault Domain

- Azure Fault domains define the group of virtual machines that share a **common power source** and **network switch**.
- Each and every fault domain contains some racks and each rack contains a virtual machine.
- Each of these Azure Fault domain shares a power supply and a network switch.
- All the resources in the fault domain become unavailable when there is a failure in the fault domain.
- You should place your VMs in such a way that each fault domain gets one web server, one database server, and like that.

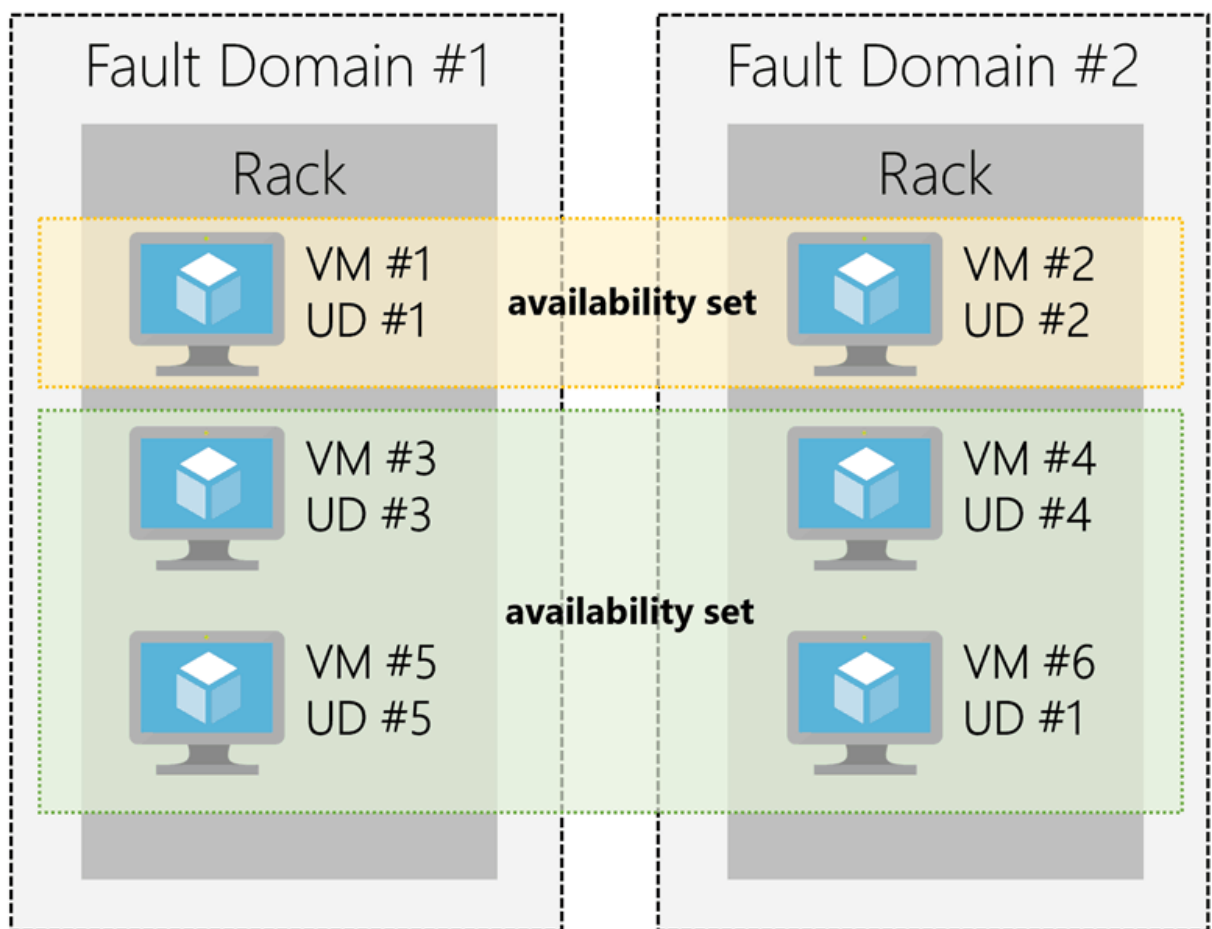


Update Domain

- Virtual machines get update domains automatically once they are put inside the availability set.
- All virtual machines within that update domain will reboot together.
- They are used for patching of the virtual machines.
- Only one update domain can be updated at the time.

How many Fault Domains and How many Update Domains we can have?

- In the Azure Service Management (ASM) portal, we have two Fault domains and 5 update domains.
- In the Azure Resource Manager (ARM) portal, we have three Fault domains and 5 update domains but we can upgrade our update domains from 5 to 20.
- VMs are assigned sequentially in the update domains and fault domains.



Key Points To Remember

- You need to create virtual machines in the same resource group as the availability set.
- Only one virtual machine can only be in one availability set.
- Virtual machines can be assigned availability set only during the creation of it.

SLA(Service Level Agreement) for VM:

- For all Virtual Machines that have two or more instances deployed in the same Availability Set, Azure guarantees you will have Virtual Machine Connectivity to at least one instance at least 99.95% of the time.
- For any Single Instance Virtual Machine using premium storage for all disks, Azure guarantees you will have Virtual Machine Connectivity of at least 99.9%

VM SLA
99.9% with Premium Storage



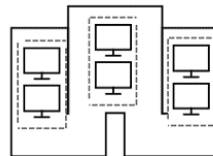
SINGLE VM
Easier lift and shift

VM SLA
99.95%



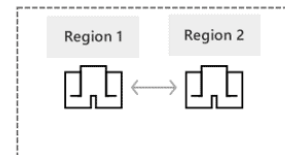
AVAILABILITY SETS
Protecting against failures within datacenters

VM SLA
99.99%



AVAILABILITY ZONES
Protection from entire datacenter failures

MULTI-REGION DISASTER RECOVERY



REGION PAIRS
Regional protection within Data Residency Boundaries