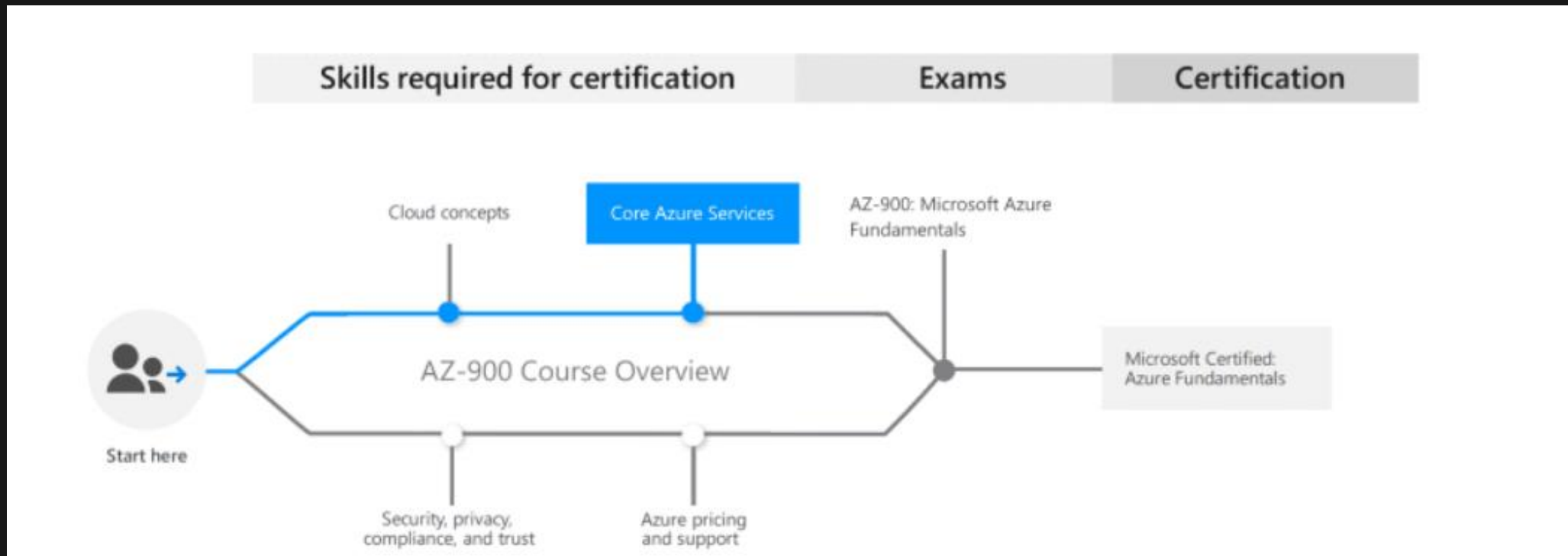


Cloud Computing with Microsoft Azure

www.drmukhan.com

Module 2: Describe Core Azure Services



Lecture Objectives

Skills Learned

- Describe **Data Center**
- Describe **Regions** and **Region Pairs**
- Describe **Geographies**
- Describe **Availability Zones**
- Describe **benefits** and **usage** of core architectural components
- Describe Azure **Resource**
- Describe Azure **Resource Groups**
- Describe Azure **Resource Manager**
- Describe **benefits** and **usage** of core architectural components (resources, resource groups & resource manager)

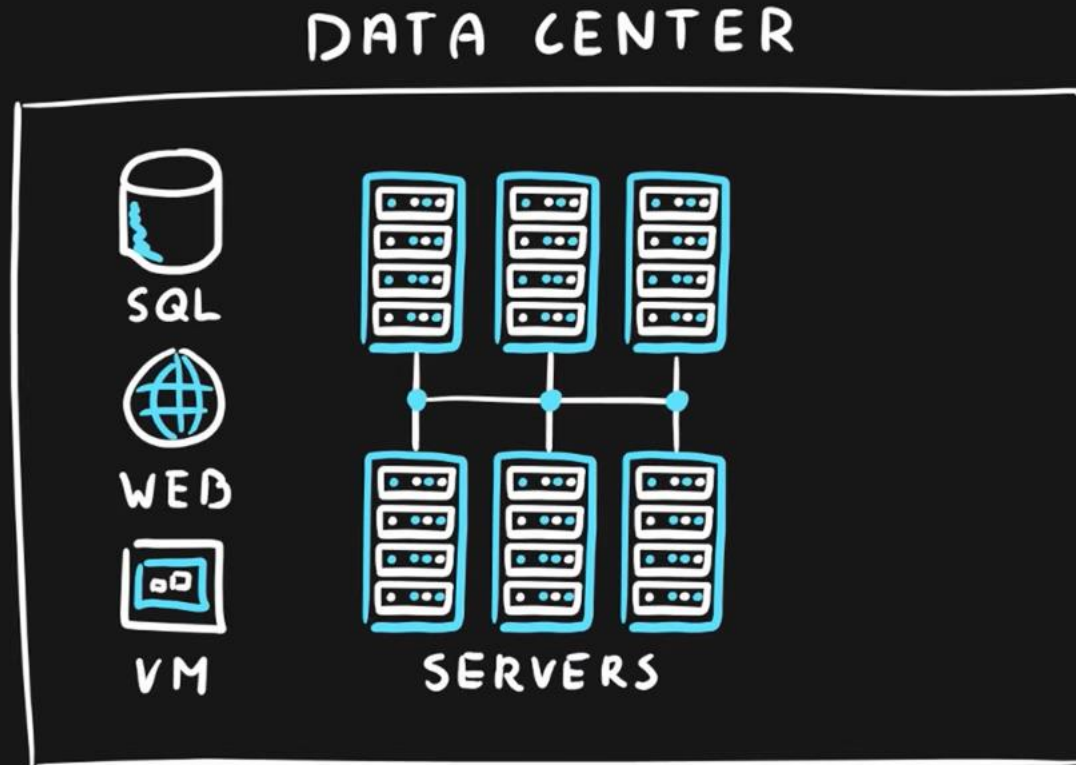
Data Center

Key Characteristics

Data Center

Key Characteristics

- Physical facility
- Hosting for group of networked servers



DATA → Excel Sheet

TABLES

MATHS:

Rows/Col

↓ ↓ ↓ (Colms)

1 1 3 6

2 4 2 6

3 4 4 5

Rows = Records = Samples

Columns = attributes

↳ FEATURES

↳ VARIABLES

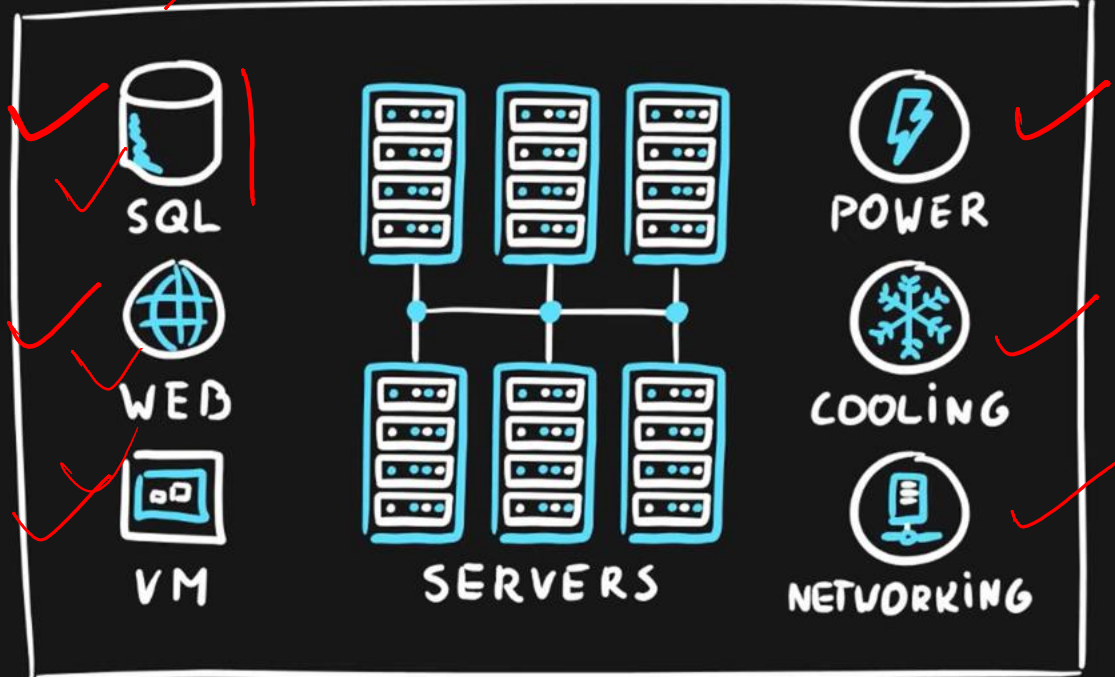
⇒ data points

Data Center

Key Characteristics

- Physical facility
- Hosting for group of networked servers
- Own power, cooling & networking infrastructure

DATA CENTER



Azure Infrastructure

Overview

Point-to-Point (PTP)

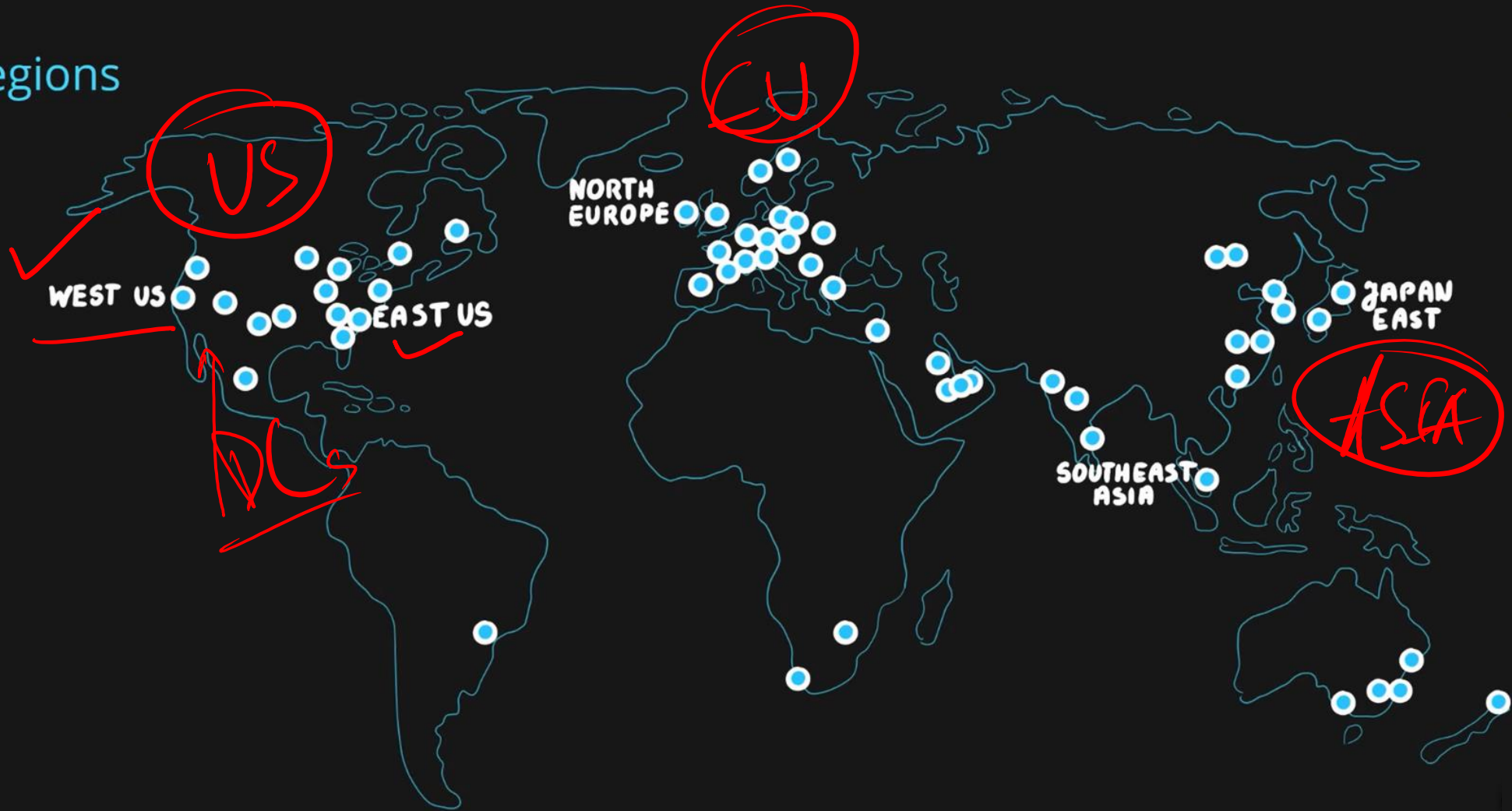
Region

DC1/DC2



Azure Infrastructure

Regions



Region

Key Characteristics

- Geographical area on the planet
- One but usually more datacenters connected with low-latency network (<2 milliseconds)

Region

Key Characteristics

- Geographical area on the planet
- One but usually more datacenters connected with low-latency network (<2 milliseconds)
- Location for your services

Region

Key Characteristics

- Geographical area on the planet
- One but usually more datacenters connected with low-latency network (<2 milliseconds)
- Location for your services
- Some services are available only in certain regions
- Some services are global services, as such are not assigned/deployed in specific region

Region

Key Characteristics

- Geographical area on the planet
- One but usually more datacenters connected with low-latency network (<2 milliseconds)
- Location for your services
- Some services are available only in certain regions
- Some services are global services, as such are not assigned/deployed in specific region
- Globally available with 50+ regions
- Special government regions (US DoD Central, US Gov Virginia, etc.)
- Special partnered regions (China East, China North)

- ☰
- + Create a resource
- 🏠 Home
- 📊 Dashboard
- ☰ All services
- ★ FAVORITES
- 📊 All resources
- 📦 Resource groups ✓
- 🖥️ Virtual machines
- 📁 Storage accounts ✓

Search resources, services, and docs (G+/)



Storage accounts

+ Create 🔍 View

Description

Create a storage account to store up to 500TB of data in the cloud. Use a general-purpose storage account to store object data, use a NoSQL data store, define and use queues for message processing, and set up...

[See more](#) ▾

Free training from Microsoft

Storage tips
 ① FILES
 ② DATA

Names / Credentials of Resource

Storage Logs



Create storage account

Resource group *

Instance details

The default deployment model is Resource the classic deployment model instead. [Cho](#)

Storage account name *

Location *

Performance

Account kind

Replication

Access tier (default)

Recommended ⓘ

(US) East US ✓

(US) East US 2

(US) South Central US ✓

(US) West US 2

(Asia Pacific) Australia East

(Asia Pacific) Southeast Asia

(US) East US 2

Standard Premium

StorageV2 (general purpose v2)

Read-access geo-redundant storage (RA-GRS)

Cool Hot

COST

~~Asynchronous~~

Data Center	Average Latency	History
 Germany North	27ms ✓	 <i>of out data</i>
 West Europe	41ms ✓	
 Switzerland North	42ms	
 Switzerland West	44ms	
 Norway East	46ms	
 France Central	50ms	
 West UK	51ms	
 South UK	54ms	
 North Europe	60ms	
 East US	128ms	

B2C

The region of DC should be as closer as possible to gate latency.

Products by region ▾ Select product

Products

Browse ▾ Search for a product 🔍

Regions

2 of 56 selected

Select all/none

<input type="checkbox"/> Non-regional	<input type="checkbox"/> France
<input type="checkbox"/> Africa	<input type="checkbox"/> Germany
<input type="checkbox"/> Asia Pacific	<input type="checkbox"/> Germany Non-Regional (Sovereign)
<input type="checkbox"/> Australia	<input type="checkbox"/> Germany Central (Sovereign)
<input type="checkbox"/> Azure Government	<input checked="" type="checkbox"/> Germany North (Public)
<input type="checkbox"/> Brazil	<input type="checkbox"/> Germany Northeast (Sovereign)
<input type="checkbox"/> Canada	<input type="checkbox"/> Germany West Central (Public)
<input type="checkbox"/> China	<input type="checkbox"/> India
<input type="checkbox"/> Europe	<input type="checkbox"/> Japan
<input type="checkbox"/> North Europe	<input type="checkbox"/> Korea
<input checked="" type="checkbox"/> West Europe	<input type="checkbox"/> Norway
<input type="checkbox"/> Compare with Azure Stack Hub	<input type="checkbox"/> Switzerland
	<input type="checkbox"/> United Arab Emirates
	<input type="checkbox"/> United Kingdom
	<input type="checkbox"/> United States

Go Social

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Microsoft Azure

- Solutions
- Products
- Datacenter regions
- Case Studies
- Pricing
- Calculator
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- Samples
- Marketplace
- Global infrastructure

Support

- Forums
- Azure Status Dashboard
- Support

Hello from Seattle.

English (US)

US Dollar (\$)

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https://www.youtube.com/watch?v=5NMcm4zJPM4&pp=ugUEEgJlbg%3D%3D







Browser tabs: Create storage account - Micros..., Azure Speed Test 2.0, Azure Products by Region | Micro...

URL: https://azure.microsoft.com/en-us/global-infrastructure/services/?products=all

Products	West Europe	Germany North (Public)
Notification Hubs	✓	
API Management	✓	✓
Azure SignalR Service	✓	
Azure Spring Cloud	■	
WINDOWS VIRTUAL DESKTOP		
Windows Virtual Desktop		

Release dates, features and requirements are subject to change prior to final commercial release of the products/features/software described herein. This page is for informational purposes only. MICROSOFT MAKES NO WARRANTIES, EXPRESSED, IMPLIED, OR STATUTORY, AS TO THE INFORMATION ON THIS PAGE. To see which regions [Microsoft Azure Offers](#) may be eligible, see [Find Azure credit offers in your region](#).

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Microsoft Azure

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Community

- Blog
- Azure Updates
- Tech Community
- Events
- Careers
- Education
- Students
- Startups

Support

- Forums
- Azure Status Dashboard
- Support

Account

- Microsoft Azure portal
- Preview Features
- Privacy data management
- Download Azure Mobile App

Trusted

- Security
- Privacy
- Compliance

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English (US) ▾

US Dollar (\$) ▾

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Microsoft
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Region

Key Characteristics

- Geographical area on the planet
- One but usually more datacenters connected with low-latency network (<2 milliseconds)
- Location for your services
- Some services are available only in certain regions
- Some services are global services, as such are not assigned/deployed in specific region
- Globally available with 50+ regions
- Special government regions (US DoD Central, US Gov Virginia, etc.)
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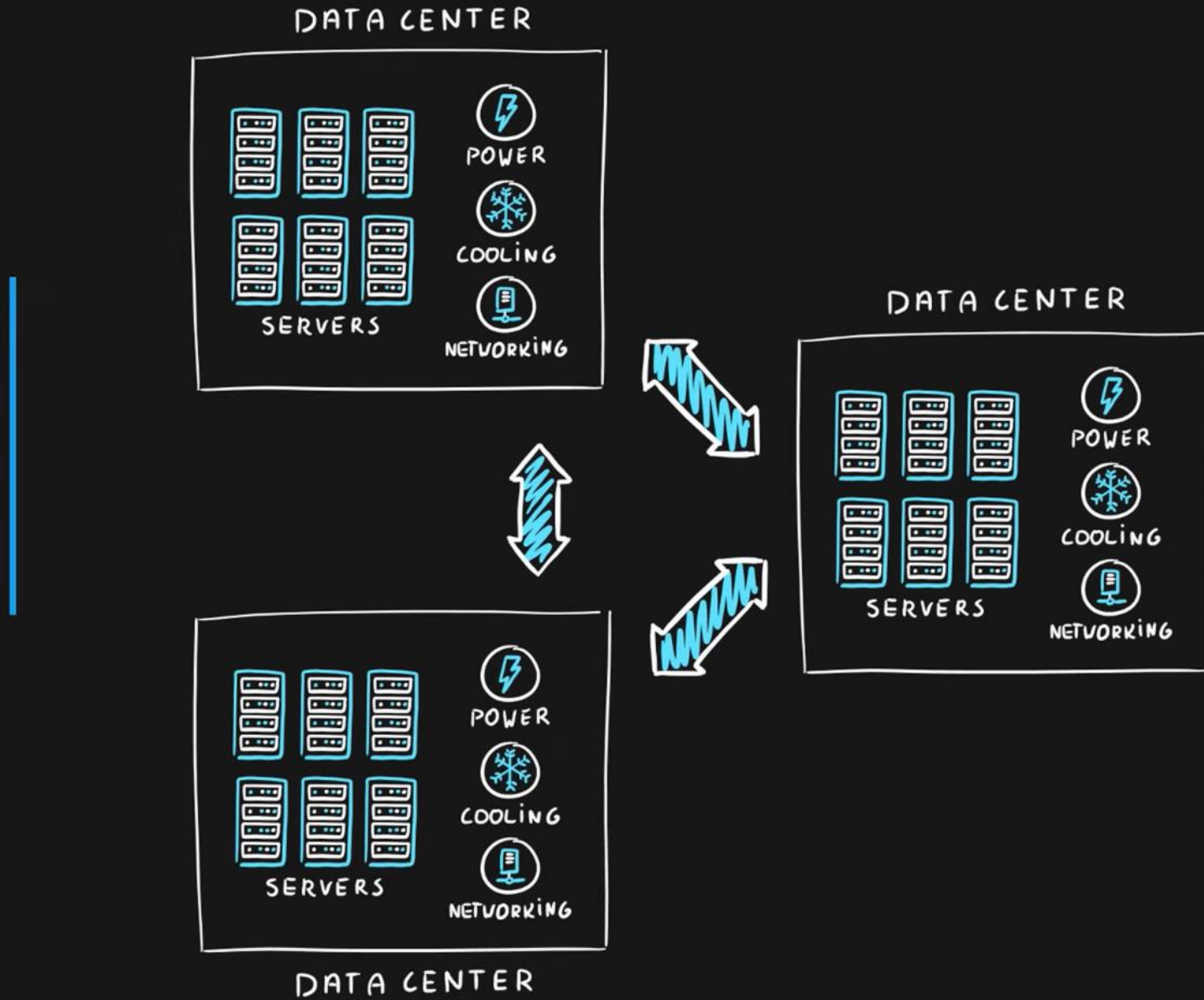
Availability

Zone

Key Characteristics

Availability Zone

Key Characteristics

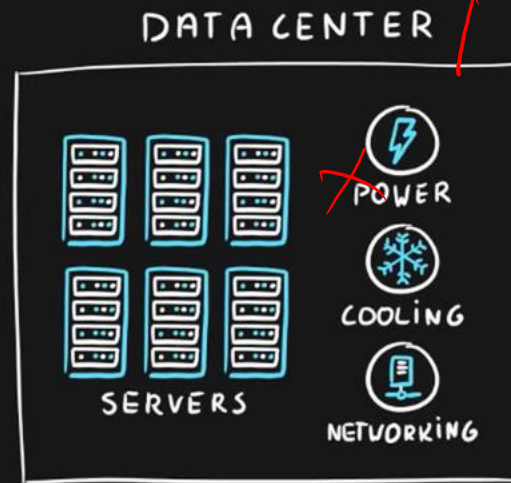


Availability Zone

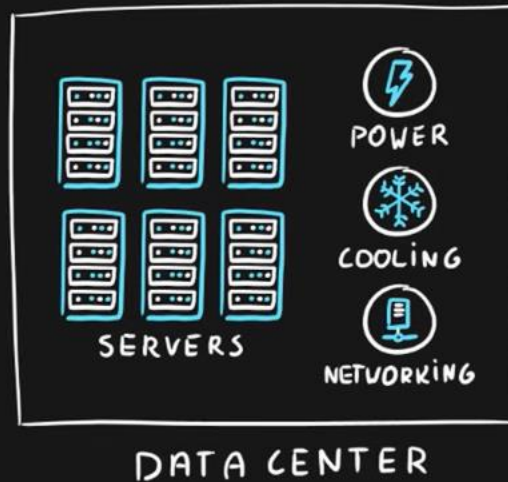
Key Characteristics

- Regional feature ✓
- Grouping of physically separate facilities
- Designed to protect from data center failures

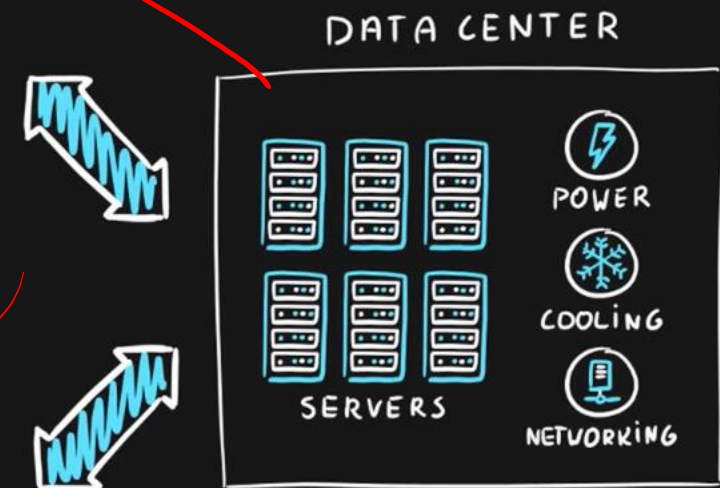
AVAILABILITY ZONE #1



AVAILABILITY ZONE #2



AVAILABILITY ZONE #3



~~Fault Tol~~
~~Disrupt~~

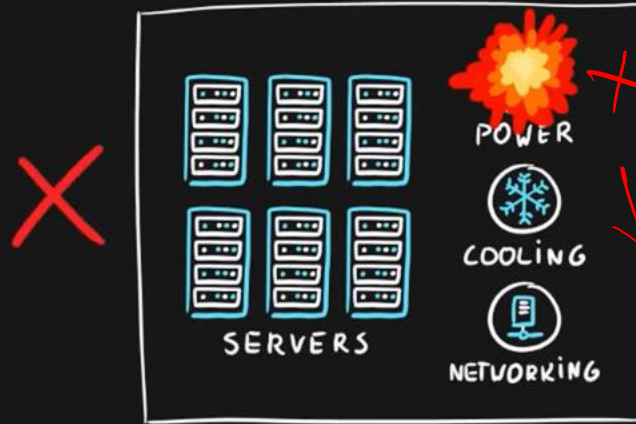
Availability Zone

Key Characteristics

- Regional feature
- Grouping of physically separate facilities
- Designed to protect from data center failures
- If zone goes down others continue working

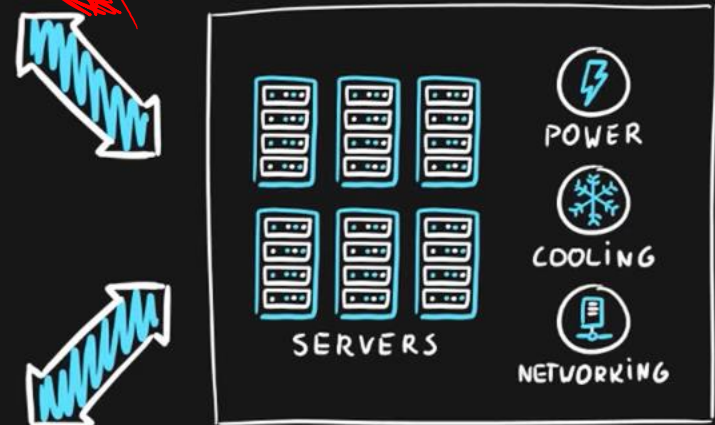
AVAILABILITY ZONE #1

DATA CENTER

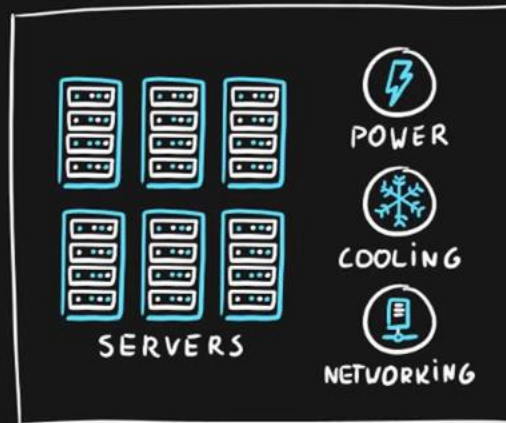


AVAILABILITY ZONE #3

DATA CENTER



AVAILABILITY ZONE #2



DATA CENTER

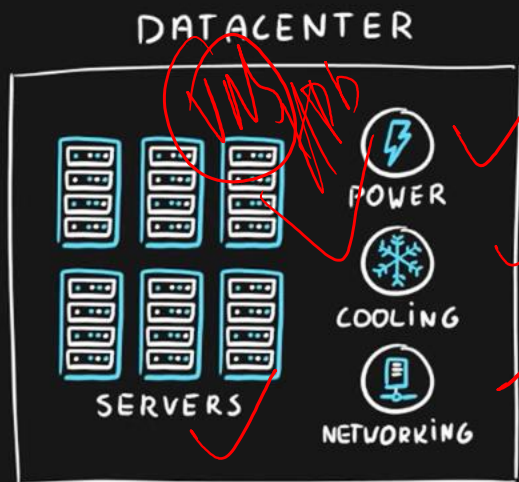


Availability Zone

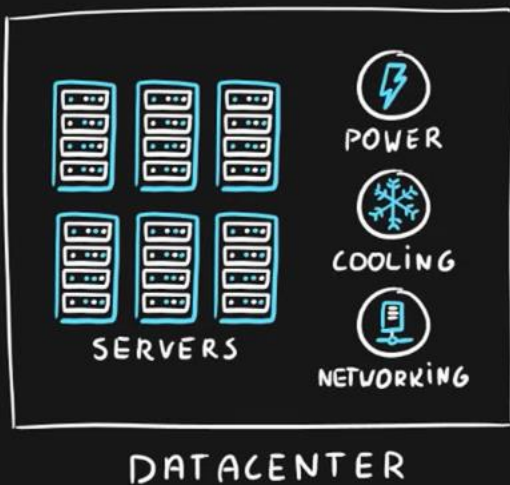
Key Characteristics

- Two service categories
 - Zonal services (Virtual Machines, Disks, etc.)
 - Zone-redundant services (SQL, Storage, etc.)

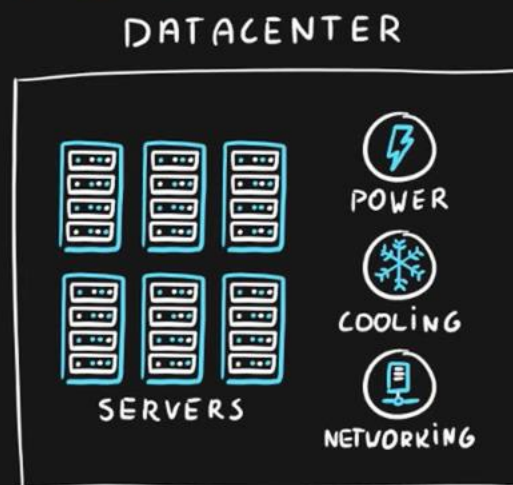
AVAILABILITY ZONE #1



AVAILABILITY ZONE #2



AVAILABILITY ZONE #3



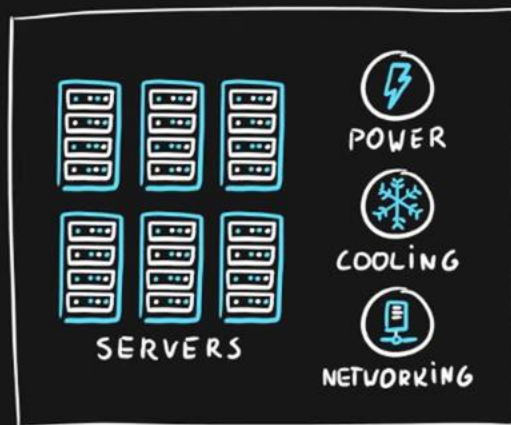
Availability Zone

Key Characteristics

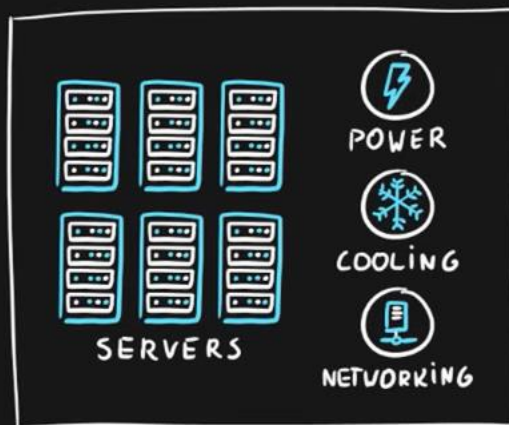
- Not all regions are supported
- Supported region has three or more zones

AVAILABILITY ZONE #1

DATACENTER



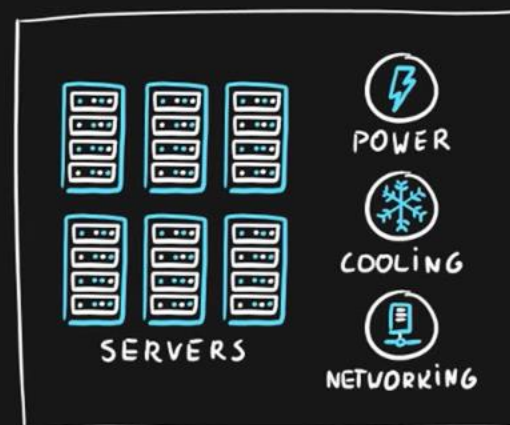
AVAILABILITY ZONE #2



DATACENTER

AVAILABILITY ZONE #3

DATACENTER



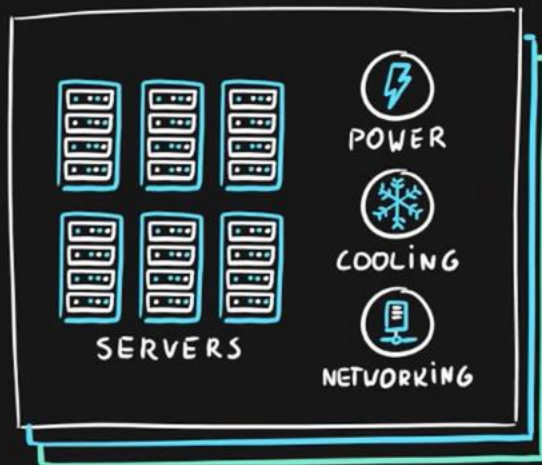
Availability Zone

Key Characteristics

- Not all regions are supported
- Supported region has three or more zones
- A zone is one or more data centers ✓

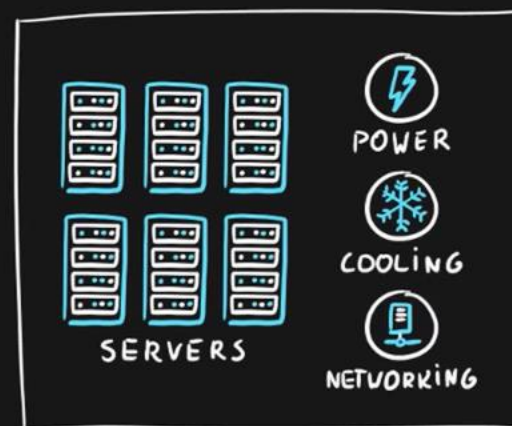
AVAILABILITY ZONE #1

DATACENTER

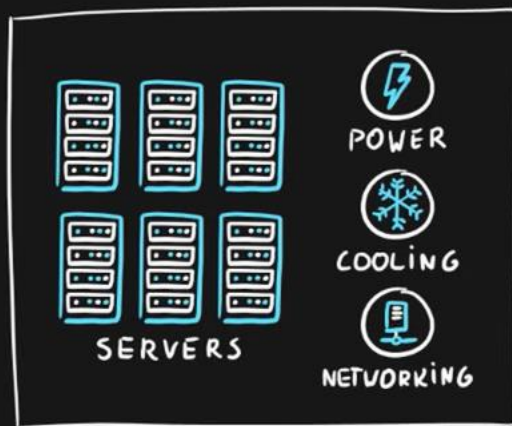


AVAILABILITY ZONE #3

DATACENTER



AVAILABILITY ZONE #2

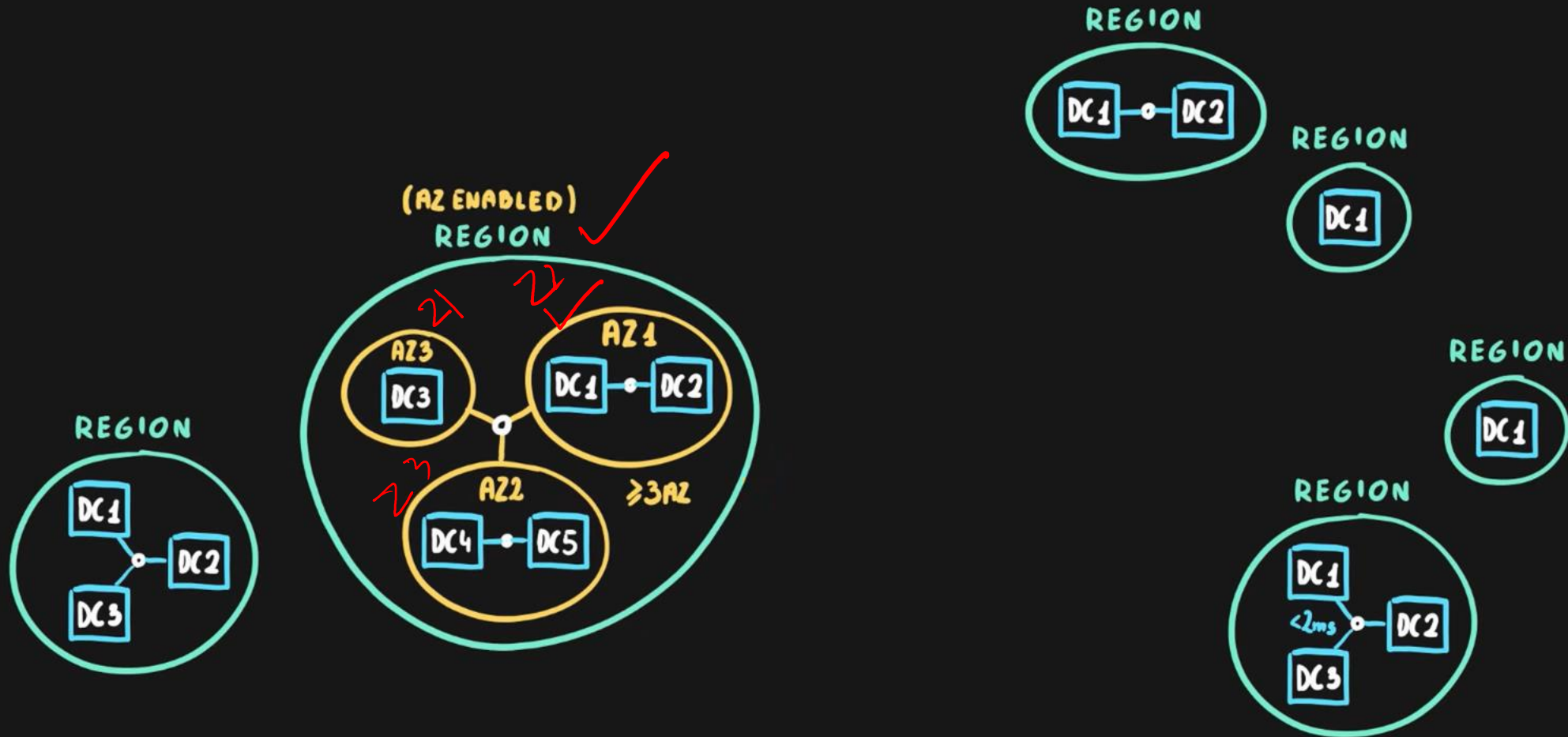


DATACENTER



Azure Infrastructure

Overview



Create storage account - Micro... x Azure Speed Test 2.0 x Azure Products by Region | Micro... x +

https://portal.azure.com/#create/Microsoft.StorageAccount

Microsoft Azure Search resources, services, and docs (G+)

Dashboard > Storage accounts >

Create storage account

Resource group *

Instance details

The default deployment model is Resource Manager. You can choose the classic deployment model instead. [Choose](#)

Storage account name * ⓘ

Location *

Performance ⓘ Standard Premium

Account kind ⓘ StorageV2 (general purpose v2) ▾

Replication ⓘ Read-access geo-redundant storage (RA-GRS) ▾

Access tier (default) ⓘ Cool Hot

[Review + create](#) < Previous Next : Networking >

(US) West US 2
(Asia Pacific) Australia East
(Asia Pacific) Southeast Asia
(Europe) North Europe
(Europe) UK South
(Europe) West Europe
(US) Central US
(US) East US 2

Instance details

The default deployment model is Resource Manager, which supports the latest Azure features. You may choose to deploy using the classic deployment model instead. [Choose classic deployment model](#)

Storage account name * ⓘ ⓘ

Location *

Performance ⓘ

Account kind ⓘ

Replication ⓘ

Access tier (default) ⓘ

Locally-redundant storage (LRS)

Zone-redundant storage (ZRS)

Geo-redundant storage (GRS)

Read-access geo-redundant storage (RA-GRS)

Geo-zone-redundant storage (GZRS)

Read-access geo-zone-redundant storage (RA-GZRS)

Read-access geo-redundant storage (RA-GRS)

Cool Hot

Review + create

< Previous

Next : Networking >

Redund

Define/Define

Assignment #2

Instance details

The default deployment model is Resource Manager, which supports the latest Azure features. You may choose to deploy using the classic deployment model instead. [Choose classic deployment model](#)

Storage account name * ⓘ

Location *

(US) South Central US ▼

Performance ⓘ

Standard Premium

Account kind ⓘ

StorageV2 (general purpose v2) ▼

Replication ⓘ

Read-access geo-redundant storage (RA-GRS) ▲

Access tier (default) ⓘ

Locally-redundant storage (LRS)

Geo-redundant storage (GRS)

Read-access geo-redundant storage (RA-GRS)

[Review + create](#)

[< Previous](#)

[Next : Networking >](#)

- ☰
- + Create a resource
- 🏠 Home
- 📊 Dashboard
- ☰ All services
- ★ FAVORITES
- 📊 All resources
- 📁 Resource groups ✓
- 🖥️ Virtual machines ✓
- 📁 Storage accounts

Microsoft Azure

Search resources, services, and docs (G+/)

Dashboard >

Virtual machines


Default Directory

+ Add ✓ | ⌚ Reservations | ☰ Edit columns | ↻ Refresh | 🏷️ Assign tags | ▶ Start | ⏪ Restart | ⏹ Stop | 🗑️ Delete

Virtual machine

Start with a preset configuration | source groups | All types | All locations | All tags

0 items

Name ↑↓	Type ↑↓	Status	Resource group ↑↓	Location ↑↓
				

Handwritten notes:

- Compute
- Storage
- RAM
- Hard disk/SSD
- WebServer
- Power button/CPU
- Memory

- ☰
- + Create a resource
- 🏠 Home
- 📊 Dashboard
- ☰ All services
- ★ FAVORITES
- 📊 All resources
- 📁 Resource groups
- 🖥️ Virtual machines
- 📁 Storage accounts

Microsoft Azure

Search resources, services, and docs (G+)

Dashboard >

Virtual machines


Default Directory

+ Add ▾ ⌚ Reservations ☰ Edit columns ↻ Refresh | 🏷️ Assign tags ▶ Start ↺ Restart ☐ Stop 🗑️ Delete

Virtual machine – Don't see a subscription? [Open Directory + Subscription settings](#)

Start with a preset configuration source groups ▾ All types ▾ All locations ▾ All tags ▾

0 items

Name ↑↓	Type ↑↓	Status	Resource group ↑↓	Location ↑↓
				

Region * ⓘ (US) East US 2

Availability options ⓘ Availability zone

Availability zone * ⓘ

Image * ⓘ ✓

Azure Spot instance ⓘ ✓

Size * ⓘ Standard_D2s_v3 - 2 vcpus, 8 GiB memory (€59.10/month)

Administrator account

Authentication type ⓘ SSH public key Password

i Azure now automatically generates an SSH key pair for you and allows you to store it for future use. It is a fast, simple, and secure way to connect to your

Review + create

< Previous

Next : Disks >

1 ✓
2 ✓
3 ✓



App ⇒ SSH

Spends

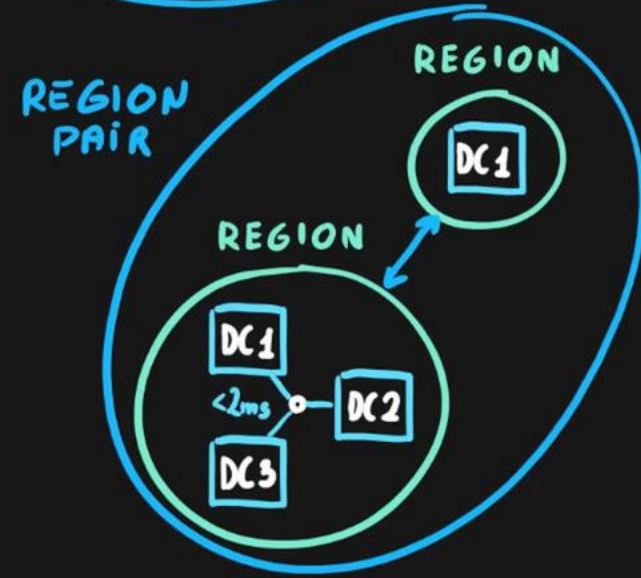
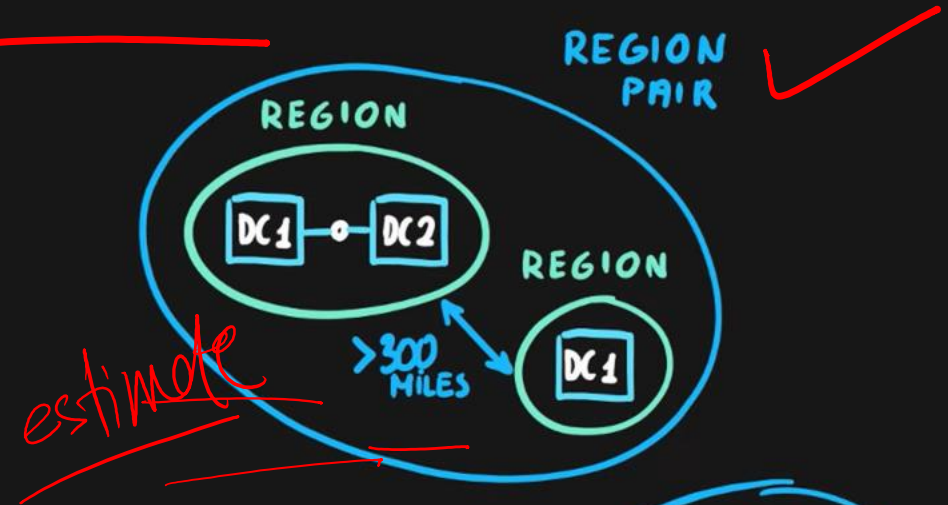
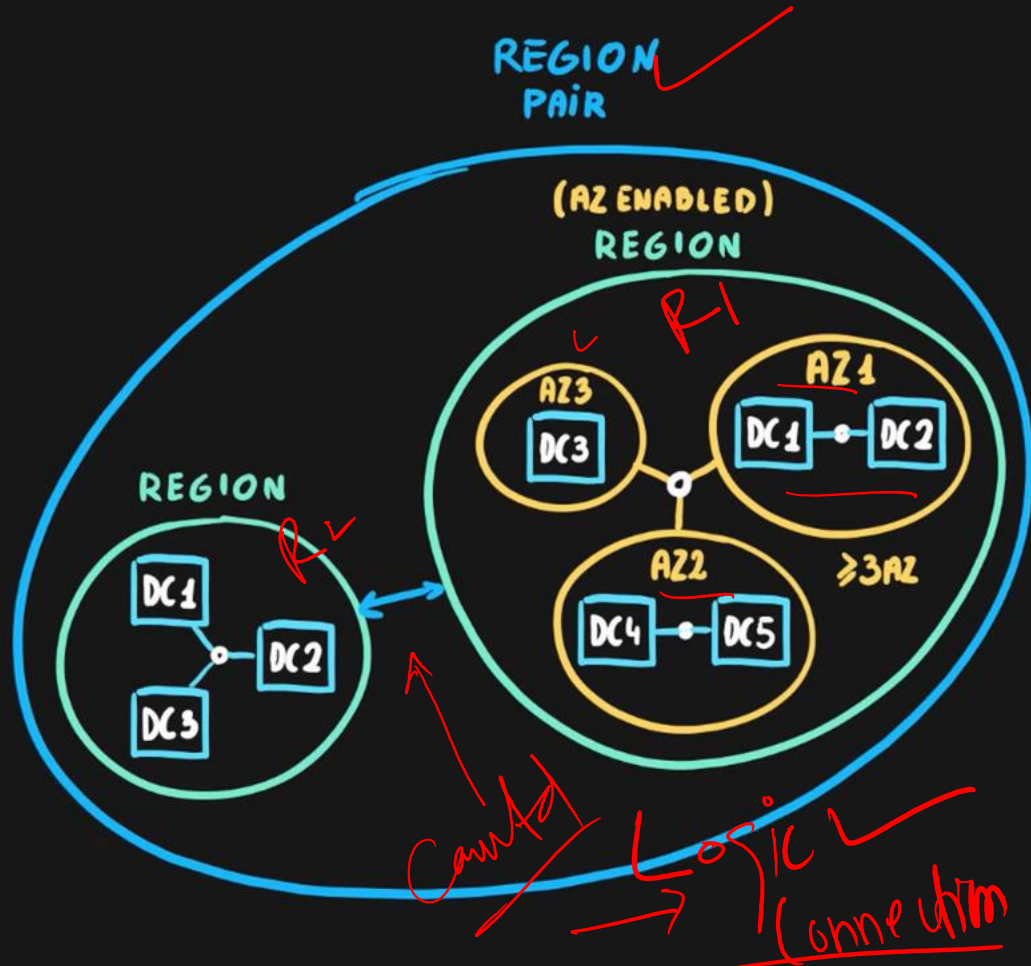
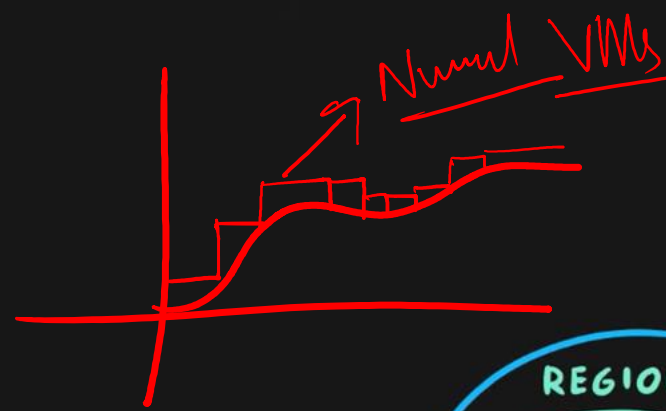
Highlevel

Public / Priv / pairs

Logic
account

Azure Infrastructure

Overview



Region Pairs

Key Characteristics

- Each region is paired with another region making it a region pair
- Region pairs are static and cannot be chosen
- Each pair resides within the same geography*

Binary Pairs

→ 1 2 3 4 → Same

Each pair resides within the same geography*

Region Pairs

Key Characteristics

- Each region is paired with another region making it a region pair
- Region pairs are static and cannot be chosen
- Each pair resides within the same geography*
 - Exception is Brazil South
- Physical isolation with at least 300 miles distance (when possible)
- Some services have platform-provided replication
- Planned updates across the pairs
- Data residency maintained for disaster recovery

> 300 miles

Platform (AZ ML)

Region Pairs

Key Characteristics

Region Pair A

East US

UK West

North Europe (Ireland) ✓

East Asia (Hong Kong) ✓

Region Pair B

West US ✓

UK South ✓

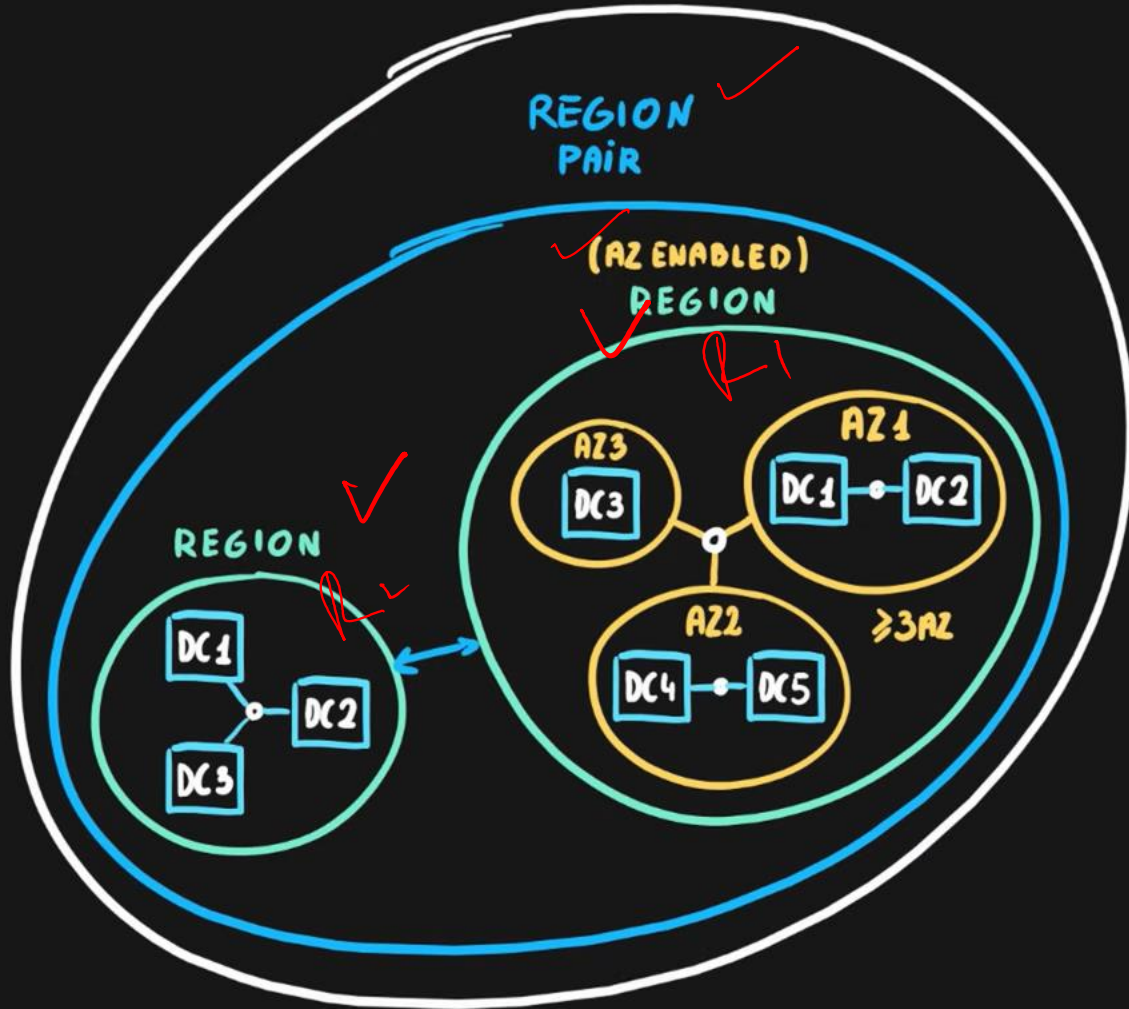
West Europe (Netherlands) ✓

Southeast Asia (Singapore)

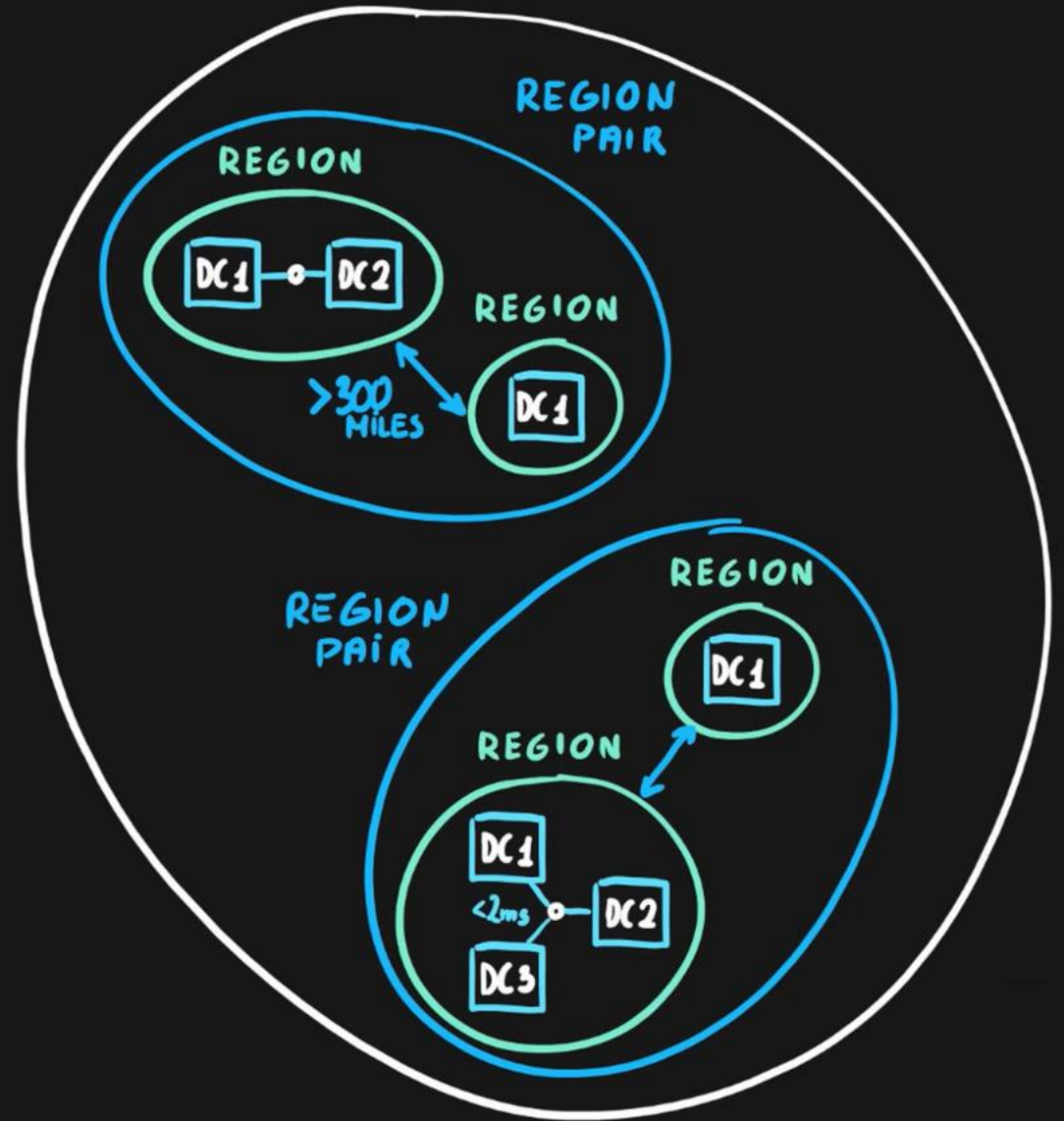
Azure Infrastructure

Overview

GEOGRAPHY




GEOGRAPHY



Geographies

Key Characteristics

- Discrete market
 - Typically contains two or more regions
 - Ensures data residency, sovereignty, resiliency, and compliance requirements are met
 - Fault tolerant to protect from region wide failures
- 

Geographies

Key Characteristics

- Discrete market
- Typically contains two or more regions
- Ensures data residency, sovereignty, resiliency, and compliance requirements are met
- Fault tolerant to protect from region wide failures
- Broken up into areas
 - Americas, ✓
 - Europe, ✓
 - Asia Pacific, ✓
 - Middle East and Africa ✓
- Each region belongs only to one Geography

4 Geographies

THANK YOU!