Azure Core Services

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Summary

Core Azure Architectural Concepts

- Azure is a global cloud offering deployed to various geographies across the globe.

- Within those geographies (marketplaces) are multiple **Regions**. Regions are paired with other regions for availability, fault tolerance, & redundancy.

- Within regions are **Availability Zones** which ensure those characteristics within a region.

Azure Subscriptions & Billing Scope

- Azure billing is tied to an Azure account with, **Three Types of Billing Accounts** available**:**

  - Enterprise Agreement

  - Microsoft Online Services Program

- Microsoft Customer Agreement
- Azure subscriptions are associated with an Azure billing account.
- Subscriptions act as containers for Azure resource groups and along with billing accounts enable you to control how your Azure services are billed and payed for.

Core Azure Services

- **Core Compute Services**
  - Include VMs and can leverage **scale sets** & **availability sets** for scalability and high availability.
- **Azure App Service**
  - Azure App Service makes it easy to build and deploy web applications without worrying about the underlying infrastructure needed for development and deployment.
- **Containers** - enable you to easily roll out and manage VM instances tailored for specific users.
- **Azure Kubernetes** - A container orchestration service.

Core Azure Storage

- Storage Account

  https://docs.microsoft.com/en-us/azure/storage/common/storage-account-overview

- **Blob Storage**
  - Used for storing large amounts of data for access in various ways.
  - Limits
    - https://docs.microsoft.com/en-us/azure/azure-resource-manager/management/azure-subscription-service-limits#azure-blob-storage-limits
  - Pricing

- Storage costs are calculated according to the following factors:

  - **Region** refers to the geographical region in which your account is based.

  - **Account type** refers to the type of storage account you're using.

  - **Access tier** refers to the data usage pattern you've specified for your general-purpose v2 or Blob storage account.

  - **Capacity** refers to how much of your storage account allotment you're using to store data.

  - **Redundancy** determines how many copies of your data are maintained at one time, and in what locations.

  - **Transactions** refer to all read and write operations to Azure Storage.

  - **Data egress** refers to any data transferred out of an Azure region. When the data in your storage account is accessed by an application that isn't running in the same region, you're charged for data egress. For information about using resource groups to group your data and services in the same region to limit egress charges, see What is an Azure resource group?.

- **Disk Storage**

  - Primarily used for virtual disks for VMs.

- **File Storage**

  - Let's you store files independently of a logical disk.

- **Azure Data Lake**

  - Azure Data Lake includes all the capabilities required to make it easy for developers, data scientists, and analysts to store data of any size, shape, and speed, and do all types of processing and analytics across platforms and languages.

  https://azure.microsoft.com/en-us/solutions/data-lake/

Core Data Services

- Many types of data management services for structured, semi-structured, and unstructured data.

- Relational solutions such as **SQL Server** for storing tabular data and

- **CosmosDB** is a NoSQL solution.

  https://docs.microsoft.com/en-us/azure/cosmos-db/account-databases-containers-items

  https://docs.microsoft.com/en-us/azure/cosmos-db/introduction#key-benefits

Exam Essentials

Describe the core Azure architectual components

- **Geographies**

  - Align to markets but can be considered as aligning to countries. For example, Europe is a geography that encompasses multiple countries.

- **Regions**

  - Are nested within geographies.

- **Availability Zones**

  - Are nested within regions and enable services to be distributed across multiple physical data centers to ensure high availability, resiliency, & fault tolerance.

  - Has its own power, cooling, & network resources.

- **Resource Groups**

  https://docs.microsoft.com/en-us/azure/azure-resource-manager/management/overview#resource-groups

  - Resource groups are logical containers that you use to group together Azure resources and enable you to control access to the resources and their management and otherwise manage the resources in the group as a whole.

  - **Resource Tag Inheritance**

- https://docs.microsoft.com/en-us/azure/azure-resource-manager/management/tag-resources?tabs=json#inherit-tags
- **Azure Resource Manager (ARM)**
  - ARM lets you create resources in a declarative way using templates, which it passes to the target Azure service provider to create the service.
  - https://docs.microsoft.com/en-us/azure/azure-resource-manager/management/
- **Billing**
  - Mechanisms by which you are billed for Azure services.
  - **Subscriptions**
    - Serve as a container for Azure resources, and a resource can exist in only one subscription, you can move resources across subscriptions.
    - Serve as a billing boundary, enabling you to charge different groups within your organization for various Azure resources.
    - An Azure subscription is linked to a single account, the one that was used to create the subscription and is used for billing purposes. Within the subscription, resources can be provisioned as instances of the many Azure products and services.

Describe some of the core products available in Azure

- **Virtual Machines (VMs)**
  - Instance of a computer running as a guest on a physical host through a hypervisor.
  - **Scale sets**
    - Let you scale VMs out to accommodate demand changes.
    - Include a load balancer to distribute load among VMs
  - **Availability Set**
    - Distributes VMs across multiple **fault & update domains**.

- Guards against outages in fault domains
- Allows VMs to be updated without causing the set as a whole to be unavailable through Update domains
- **Azure App Service**
  - Azure App Service plan overview
    https://docs.microsoft.com/en-us/azure/app-service/overview-hosting-plans
  - PaaS offering that simplifies developing and deploying web applications. Takes care of the underlying infrastructure so you can focus on development.
- **Azure Container Instance**
  - Supports the creation and management of containers.