**MS Azure Cloud (5th Nov 2019)**

**Challenges Facing on Premises:**

Infrastructure costing

Compute, storage and network

Scaling

Scale up – increase the size of existing instance.

Scale out – increase the number of instances.

Backup

Explicit backup policies need to be implemented.

Security

For application and network need to be configured explicitly.

Monitoring

Need to configure monitoring services.

Compliance

**Cloud: MS, Amazon, Google etc.**

In cloud no need to buy infrastructure – No Infra Cost

Scaling of application instances happens quickly.

Backup – in-built backup policies implemented.

Security – all levels security is enabled.

Monitoring is by default enabled.

Compliance – All kinds’ application can be deployed.

**Pay As You Go Model**

New frameworks and technologies are adopted.

**Types of Clouds:**

Private Cloud [HP, Oracle]

Cloud infrastructure for a single customer.

Cloud vendor provide service only for a single customer.

Public Cloud

Anybody can register and create an account.

You can buy the subscription and start creating services.

Multiple users share the same infrastructure.

Cheaper compared to private cloud.

Hybrid Cloud

Combination of public and private cloud.

Transaction data can be on private cloud and older data can be on public cloud.

**Cloud Models:**

Cloud services include DB Services, compute services, storage services, server less services, messaging services, Identity services, AI services and analytics services and more.

**There are three cloud service models**:

**IaaS** – Infrastructure as a service

Cloud vendor offers infra services like compute (CPU, RAM), storage, network etc.

You can set up your own app infra using the IaaS services.

This services are used by Admins (IT pros)

**PaaS** – Platform as a service

This is used by developers.

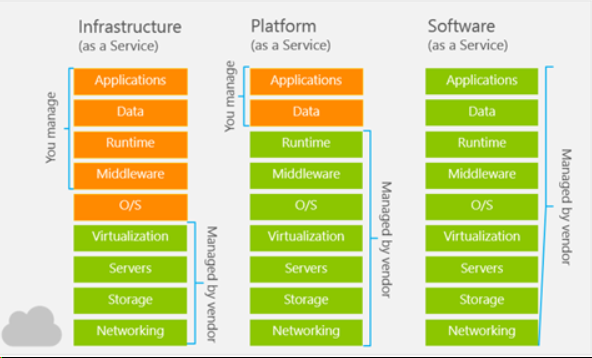
Developers will get a preconfigured platform where server, database and security is already configured.

**SaaS** – Software as a service

It is used by end users.

Software is also provided by the cloud vendor.

End user need to login and start using the application.



**Azure Cloud:**

Provides IaaS and PaaS services.

Azure is having Data Centers in more than 50 regions.

Azure subscription

Free subscription

Free trail – 13000 Rs / $200 for a month.

MSDN subscription

Azure pass

Pay as Yo Go – monthly bill.

Corporate accounts.

**Connecting Azure services**:

Web Portal (<https://portal.azure.com>)

Command line options

PowerShell

PowerShell for azure (only for windows) – AureRm Module

PowerShell Core (cross platform) – Az module

Azure CLI – Cross platform

Azure SDK for programming languages (Azure .NET SDK)

ARM templates (JSON file – declarative model)

REST API

**Azure Resource Manager Model (ARM)**

Resource group

Grouping resources

Group wise deployment, group wise deletion.

Assign permission for group of resources (RBAC-roll based access control).

Group wise billing.

**Azure PowerShell commands**

To connect azure via PowerShell

>> Connect-AzAccount

To get list of resources via PowerShell

>> Get-AzResourceGroup

To create resource group via PowerShell

>> New-AzResourceGroup –Name “HexGroup” –Location “Southeast Asia”

To remove resource group via PowerShell

>> Remove-AzResourceGroup –Name “HexaGroup”

**Locally azure CLI commands**

To login from locally azure CLI

>> az login

To get list of resources via locally azure CLI

>> az group list -o table => for tabular format result

>> az group list -o tsv => for comma seprated result

To create group via locally azure CLI

>> az group create -n HexaGroup -l “Southeast Asia”

To get help via locally azure CLI

>> az group --help

To delete group via locally azure CLI

>> az group delete -n HexaGroup

**ARM Template (To create Resource)**

JSON file that contains the list of resources need to be deployed.

Sections:

Parameters

Any dynamic value accepted from user at the time of deployment.

Variables

Used to store intermediate and reusable values.

Resources

The azure resources such as VM, VNET, Storage ACC, DB etc.

Outputs

Output need to be printed in the screen after template execution.

Upload created JSON file from Azure portal



Then execute below commands on PowerShell

>> cd /home/username

>> cd /home/amol

Then To create/Deployment resource group

>> New-AzResourceGroupDeployment -Name “MyDeploy” -ResourceGroupName “HexawareGroup” -TemplateFile “./azuredeploy.json”

>> New-AzResourceGroupDeployment -Name “MyDeploy” -ResourceGroupName “HexawareGroup” -TemplateFile “./azuredeploy.json” -TemplateParameterFile “./azuredeploy.parameters.json”

**Storage Account:**

PaaS service for storing unstructured data/files in Azure.

One storage account can store maximum 500 TB data.

Maximum of 200 storage accounts per subscription.

Every storage account as a unique name that is globally unique.

<https://mystorageacc.blob.core.windows.net/>

A Storage account provides four types of storage options:

Blob (Containers)

Unstructured blob files such as audio, video, image, text, documents files etc.

File Shares

Unstructured blob files such as audio, video, image, text, documents files etc.

It is possible to map a file share as a network drive in your machine.

It uses SMB 3.0 protocol

Queues

It is used for message based communication between applications.

One message max size is 64 kb.

Message max TTL is 7 days.

Table Storage

Key-Value pair unstructured data storage (NoSQL)

Replication:

It always takes minimum 2 copies of storage account data.

SLA of 99.99 on availability.

Methods:

LRS – Locally redundant storage (same data center)

ZRS – Zone redundant storage (only large data center)

GRS – Geo redundant storage (one country to another country)

RA-GRS – Read Access – Geo redundant storage (one country to another country access primary copy and read access to another country data center)

**Kind**:

Storage V1

All four services are available

Storage media as standard/premium

No option for selection Hot/Cool

Storage V2

Storage V1 + Blob

All service types are supported

Hot and cool is available

Standard and premium is available

Blob

Only blob (containers) type is allowed

Hot and cool is available

No premium support

**Access Tier**:

Hot

Cool

**Storage Media**:

Standard (HDD)

Premium (SSD)

**Security in Storage Account**:

Access Keys

Key1 and Key2 is available

Both the keys have admin privileges.

SAS Tokens

Shared Access Signature

Granular permission over the storage account.

**Blobs:**

Page blobs - disk file un-streamable

Block blobs -

Append blobs - streaming type Ex.

**Queues Service:**

Asynchronous message based communication.

Message max size is 64 kb.

One message max TTL is 7 days.

**Tables Storage:**

Unstructured Key-Value storage.

Data is stored as Entities.

Every entity has a row key and partition key.

An entity can have max of 256 keys.

For every entity there will be 3 built in keys – Row key, Partition key, Timestamp key etc.

**Row** key and **Partition** key is used to uniquely identify a record.

**File Shares:**

Is used to create Network file shares that can be mapped (disk drive) to your machine.

It is used as an extended storage for your machine.

It used the Blob storage concept behind.

It used the SMB 3.0 protocol that provides network mapping facility.

**Azure App Service:**

Is a compute service.

It Is a **PaaS** service used to deploy Web, API and Mobile Applications.

App service **Web app**

Is used to deploy web applications such **as MVC, Web Forms** etc.

App service **API app**

Used to deploy **RESTful services** and **web services**.

App service **Mobile app**

Mobile app backed service is deployed.

Push notifications can be sent to mobile frontend.

URL: <https://[appservicename].azurewebsites.net>

Custom domain mapping.

Every app service provides SLA of 99.9% on availability.

App service plan

Defines the SKU (Capacity) + Location

SKU (Plans)

Free plan

No SLA available

Used for testing purpose.

No custom domain mapping.

Shared infrastructure.

Shared plan

No SLA available

Custom domain mapping supported.

Shared infrastructure.

A minimal charge monthly.

Basic (B1, B2)

SLA available.

Dedicated machine.

Custom domain mapping available.

Manual scaling possible.

Not recommended for production (uses a low machine)

Standard

Recommended for production.

All feature of basic included.

Automatic scaling support.

Staging slot support (5 slots).

Daily 10 times backup.

Premium

More backup timing (50 times in a day).

Maximum 20 additional slots.

VM is created shared network.

ASE (App Service Environment) (Isolated)

VM is created in an isolated network.

**Deployment:**

Deploy from VS/VS Code

Deployment center

FTP

Github

DropBox

OneDrive

**Scale web Apps:**

Scale out – Horizontal scaling

Increase the number of instances of the application.

For performance improvement.

Manual scaling

Automatic scaling – scale based on some metric.

Scale Up – Vertical scaling

Increase size is increased than the number.

Changing the App service plan.

To increase the features.

**Deployment Slots:**

Slots are created for testing and staging environment.

By default a production slot only available.

We can create some additional slots in Standard (5 slots) and Premium (20 slots) plans.

**Cosmos DB Service:**

Database **PaaS** service.

A multi-model, planet scale database that supports multiple database engines.

**Document Types:**

Document DB (SQL API)

MongoDB API

**Key-Value Pair:**

Azure Table API

**Column-Family Type:**

Cassandra

**Graph:**

Gremlin

It uses only SSD disk.

**SLA – 99.99999 %**

Availability

Durability

Consistency

Latency

Cosmos DB Account

Select DB model

Database

Collection/Containers

Documents/Data item

**Throughput:**

Performance unit for a database and collection.

RU – Request Unit.

1 RU = one read of 1 KB data