**Fish Philosophy**

Be there

Make their day

Choose their attitude

Have Fun

Cloud is a computing service model that uses a network of remote servers hosted on the internet to store, manage and process data. it allows us to consume IT services which helps businesses to focus on more important things that adds value to the organization

**Benefits of Cloud computing**

Speed

Scale

Economy

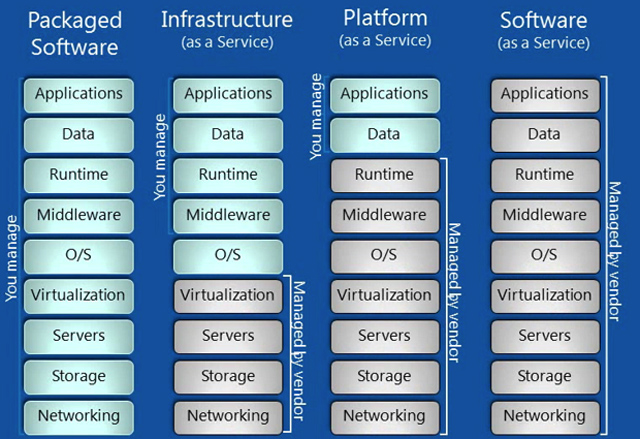
Image refers to OS

Provisioning to the Cloud

Management Portals

Scripting (Windows. Linux, Mac)

Azure resource manager



ADRMOVSSN

NRP- Network resource provide

CRP – Compute resource provider

Blob storage used for VHD

**Series of VM sizes**

A series Basic – for entry level

Only HDD

No load balancing

No auto scaling

AV2

-More RAMS and CPU

D-Series

-high compute power and temp disk performance

DS and DSv2

-SSD

FS series

G Series

H

-High Performance computing

N series

-GPU accelerated Workloads

**Availability Set**

**Fault Domain (3)**

Group of resources anticipated to fail together. same rack, same server

**Update Domain (4 – 20)**

Group of resources that will be updated together

Available set = 99.95%

Availability Zone 99.99%

Standalone VM – 99.90%

*Separate VMS to different update and fault domain*

**VM DISK LAYOUT**

Data disk

Temporary disk (Not in cluster) – Volatile and does not store persistent data

Persistent disk

Disk caching

**Cloning can be done**

-Generalized method (Coming from on prem) - do **sysprep**. Convert VHD to image

-Specialized

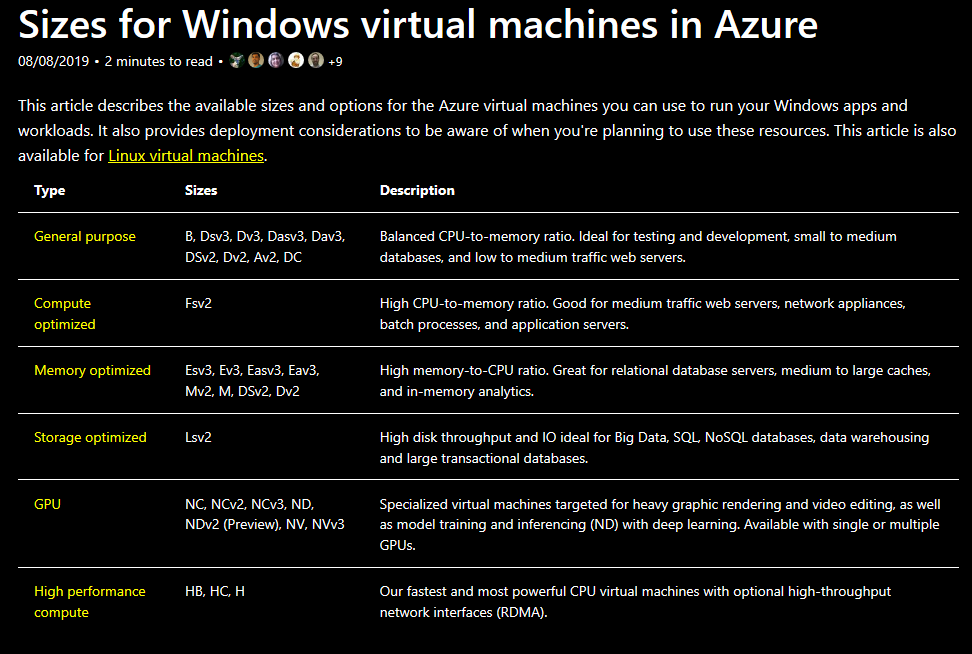
-Do not put unattend.xml on the disk

-Do not install Microsoft Azure integration components

-No Microsoft Azure agent

Scale sets

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**Azure Regions**

54 regions

Worldwide 140 available in 140 countries

**Availability Zones**

Availability Zones are physically separate locations within an Azure region. Each Availability Zone is made up of one or more datacenters equipped with independent power, cooling, and networking.

Availability Zones allow customers to run mission-critical applications with high availability and low-latency replication

**Azure Storage**

-Storage account- Accumulation of data disk

\*\*Microsoft.storage

Shrinking not advisable

Workaround is to create a snapshot and lower convert

500 I/O PS (Input output per seconds) and throughput = 60gb – **Managed disk by Microsoft**

**Storage Type**

Blob

File service

Tables

Queue

-Massively scalable

-Elastic

-Auto partitioning

-Accessible worldwide

**Storage Account**

1. **General purpose V1 & V2**

a. Standard

b. Premium

e.g.

Files – Fully Managed File Shares in the cloud,

Blobs- Binary Large Objects (For Unstructured data),

Tables

Queue

1. **Blob Storage Account**
2. Hot access Tier
3. Cool Access Tier

e.g. Blobs only

**Data Replication type**

**LRS** = Local Redundancy storage is default

3 copies of your storage in separate **fault domain and update domain.**

-cheaper, data location policy, easy to reconstruct

**ZRS** = Zonal Redundant Storage

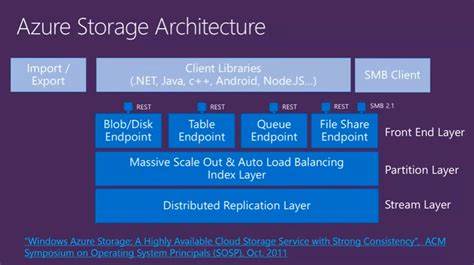
**GRS** – Geo-Redundant storage

-replicates to a secondary storage hundreds of miles away from the primary region

Another 3 copies of your storage in separate **fault domain and update domain.**

**RAGRS** – Read-access geo redundant storage

Read only from secondary region



Blob storage limit – 500 TB

-Any number of containers

**SMB – Server Message Block**

The Server Message Block (SMB) Protocol is a network file sharing protocol, and as implemented in Microsoft Windows is known as Microsoft SMB Protocol. The set of message packets that defines a particular version of the protocol is called a dialect. The Common Internet File System (CIFS) Protocol is a dialect of SMB. Both SMB and CIFS are also available on VMS, several versions of Unix, and other operating systems.

**Types of Blob Storage**

Block blob

Page Blob

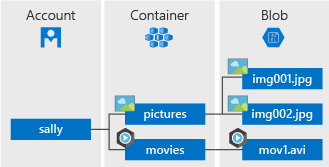
Append Blob (deprecated)

Save your on-prem disk as page blob.vhdx

File storage – SMB 2.1 AND 3.0

File storage API

**Blob storage structure**



http://<account>.blob.core.windows.net/<container>/<name>

**File Storage**

http://<account>.file.core.windows.net/<share>/<directories>/<files>

**Queue storage**

Stores large number of messages that can be accessed from anywhere using HTTP and HTTPS

Passing messages from Azure web role to Azure worker role

**Table storage**

Key-attribute storage

**Premium Storage**

High performance, Low latency

64 TB of storage per VM

80,000 IOPS per VM

2000 MBPS disk throughput per VM

<https://docs.microsoft.com/en-us/azure/virtual-machines/windows/managed-disks-overview>

<https://docs.microsoft.com/en-us/azure/virtual-machines/windows/disks-types#premium-ssd>

**Data Transfer**

AzCopy – command line to copy to and from Microsoft Azure Blob

Azure import/export service – courier service of data disk

3rd party tools

**Storage Management**

Azure generates **two 512-bit** storage access keys used for authentication

**Shared Access Signature (SAS)**

Provides delegated access to limited resources in your storage account.

Types

-Ad hoc SAS

-SAS with stored access policy

Azure storage explorer

<http://storageexplorer.com>

**What is an Azure Cloud Service Role?**

In Azure, a Cloud Service Role is a collection of managed, load-balanced, Platform-as-a-Service virtual machines that work together to perform common tasks. Cloud Service Roles are managed by Azure fabric controller and provide the ultimate combination of scalability, control, and customization

**What is a Web Role?**

Web Role is a Cloud Service role in Azure that is configured and customized to run web applications developed on programming languages/technologies that are supported by Internet Information Services (IIS), such as ASP.NET, PHP, Windows Communication Foundation and Fast CGI.

**What is a Worker Role?**

Worker Role is any role in Azure that runs applications and services level tasks, which generally do not require IIS. In Worker Roles, IIS is not installed by default. They are mainly used to perform supporting background processes along with Web Roles and do tasks such as automatically compressing uploaded images, run scripts when something changes in the database, get new messages from queue and process and more.

**Differences between the Web and Worker Roles**

The main difference between the two is that:

* a Web Role automatically deploys and hosts your app through IIS
* a Worker Role does not use IIS and runs your app standalone

Being deployed and delivered through the Azure Service Platform, both can be managed in the same way and can be deployed on a same Azure Instance.

In most scenarios, Web Role and Worker Role instances work together and are often used by an application simultaneously. For example, a web role instance might accept requests from users, then pass them to a worker role instance for processing.

**Virtual Networks**

You can segment VNet into subnets, and launch Azure Iaas VM OR Cloud services

Firewall is called NSG in azure (Network Security Group)

**VNet benefits**

* Isolation
* Security
* Connectivity
* Access to internal VMs
* Access to the public internet
* Name resolution

Just in time

Just-in-time (JIT) virtual machine (VM) access can be used to lock down inbound traffic to your Azure VMs, reducing exposure to attacks while providing easy access to connect to VMs when needed.

<https://docs.microsoft.com/en-us/azure/security-center/security-center-just-in-time>

Security with RBAC, NSG

Subnets are a range of IP within a VNET

**Resources Users of public IPs**

VMs

Internet facing load balancer

VPN Gateway

Application gateway

Dynamic IPs are not allocated at the time of creation

Static Private IPs are assigned immediately

Static Private IPs are assigned immediately and used for VMs acting as Domain Controllers and for resources that require firewall access.

VPN Gateway and Application Gateway cannot have static IP

Private IP allows communication only through VPN gateway and Application GATEWAY

**Resources Users of public IPs**

VMs

Internal facing load balancer

VPN Gateway

Application gateway

Azure load balancer allows to expose VM or cloud services within a VNET to the Internet.

-External

-Internal

**Azure deployment method**

-Classic/ Cloud Model (1 Public IP, Different Ports)

-Azure Resource Manager

+No need to create a cloud service

<https://blog.kloud.com.au/2016/04/05/azure-classic-vs-azure-resource-manager/>

<https://docs.microsoft.com/en-us/azure/azure-resource-manager/resource-manager-deployment-model>

Network Security Group (Firewall on Azure)

This is used to control inbound and outbound traffic to a NIC. It contains a list of Access Control List that allow or deny network traffic to your VM instance.

NSG rules

**Tags**

Virtual\_Network

Azure\_Load Balancer

**Deployment tool**

Portal

Azure CLI

Azure Shell

**Virtual Appliance** is just another VM in a VNET for running software-based appliance function such as firewall, WAN optimization or intrusion detection.

**Connectivity method**

SITE TO SITE – connect one network to a virtual network

POINT TO SITE – Multiple clients or servers, NOT network to network

EXPRESS ROUTE – Connectivity between your on-premise network and Microsoft Cloud through a connectivity provider. Connectivity across all regions in a geo zone.

ASM limits and resource Limits