AZ-900 Revision Chapter - 1 : Understanding Cloud Concepts

Skill 1.1: Describe the Benefits and Considerations of using Cloud Services

High Availability. Loss of availability is due to

-- Network outage

Cloud providers invest a lot of money in network infrastructure

-- Application Failure

You are responsible for applications.

However cloud provider do supply tools to help you. Like **Application Insights (Part of Azure Monitor. Also looks at Containers and vm's)**

-- System outage (such as vm)

Vm's are continually being monitored for health issues and have system in place to recover them

-- Power outage

Battery operated power backup and multiple regions to run the apps if one region goes down

-- Problem with reliant system (external database)

Using the cloud gives you trouble shooting, alerts and diagnostic tools

Scalability, Elasticity and Agility

Auto-Scale helps with Scalability

Vertical scaling adds CPU, Storage and Memory to existing vm.

Horizontal scaling adds multiple copies of the original vms

Elasticity works best with Horizontal scaling. Reducing Storage can corrupt databases.

Fault Tolerance and Disaster Recovery

Fault Tolerance is a small scale check on the health of vms

Disaster Recovery means having data and application resources in another region

(Azure will always keep copies of your data in the 3 parts of the data centre. You need tp pay if you want them in different regions).

Economic Benefits of the Cloud

On-Premises Model, Physical assets not agile. Takes time to buy and configure

Cloud Model, costs are operational and not capital. Reduced costs. Agile

Consumption Based Computing

Serverless Computing

Skill 1.2: Describe the Differences Between IaaS, PaaS and SaaS

Infrastructure-as-a-Service (Iaas)

Complete control over the vm's.

You are responsible for patching and upgrades

You will need to troubleshoot problems

Only pay for vm when it's running. Good scalability.

Has all Azure services like, **Backup()**, **Security Center()**, **Log Analytics()**...

Platform-as-a-Service (PaaS)

Cloud provider gives you middleware, Operating system, Databases, Networking

Can run Application Insights where Azure monitors how your applications are running

Publish code or a **Docker()** image into a **container()**

Offers frameworks like Node.js, .Net Core, Java, Python...

Simple deploying. From on-premise to cloud with lift-and-shift.

Has **Fault Tolerance**, **Elasticity**, **Scaling**, **Backup** and **Disaster Recovery**

Software-as-a-Service (SaaS)

Cloud provider controls everything

Pay as you go

You rent all software from cloud provider

Includes Office365, HotMail GMail

Comparing Service Types

IaaS has low running cost. Higher cost with installing and maintaining vms

PaaS same as IaaS, but you don't maintain the infrastructure. PaaS can be impacted by upgrades and version changes

SaaS can't have your own software installed. Remove IT burden. Software will run from multiple devices

Skill 1.3: Describe the Differences Between Public, Private and Hybrid Models

Public Cloud

Shared infrastructure that is accessible on a public network. Microsoft Azure is a public cloud.

Easy to setup and scale using cloud providers. Cost efficient.

You give up some of your control to the cloud provider.

Security concerns as anyone on the internet could use it.

Can also be locked into a configuration package where you need to have more resources than required.

Private Cloud

On-premise environment or hosted by third party.

Privacy and Regulatory reasons. Exists on a private network.

Public and Private main difference is privacy of infrastructure and data.

Hardware and staffing costs.

Private off-site clouds would mean you lose security

Hybrid Cloud

Mixture of public and private clouds. i.e. Cloud application that uses database from your premises.

Need to connect private on-premise network with the public cloud.

Azure has **Virtual Networks()**, **Hybrid Connections()** and **Service Bus()** for this.

Be aware of incompatibility, cost, speed issues

Azure Stack() allows you to run the Azure services on-premise.

Cost and Ownership

TABLE 1

	IaaS	**PaaS**	**SaaS**
Upfront costs	There are no upfront costs. Users pay only for what they consume.	There are no upfront costs. Users pay only for what they consume.	Users have no upfront costs; they pay a subscription, typically on a monthly or annual basis.
User ownership	The user is responsible for the purchase, installation, configuration, and	The user is responsible for the development of their own applications. However, they are not responsible for managing the server	Users just use the application software; they are not responsible for any

	IaaS	PaaS	SaaS
	management of their own software, operating systems, middleware, and applications.	or infrastructure. This allows the user to focus on the application or workload they want to run.	maintenance or management of that software.
Cloud provider ownership	The cloud provider is responsible for ensuring that the underlying cloud infrastructure (such as virtual machines, storage, and networking) is available for the user.	The cloud provider is responsible for operating system management, network, and service configuration. Cloud providers are typically responsible for everything apart from the application that a user wants to run. They provide a complete managed platform on which to run the application.	The cloud provider is responsible for the provision, management, and maintenance of the application software.