1. **Describe Cloud concepts :**

**Cloud computing =** is the delivery of computing services over the internet. Computing services include common IT infrastructure such as virtual machines, storage, databases, and networking. it doesn’t have to be constrained by physical infrastructure the same way that a traditional datacenter is.

**Shared responsibility model =** responsibilities are shared between the cloud provider and the consumer. Physical security, power, cooling, and network connectivity are the responsibility of the cloud provider. At the same time, the consumer is responsible for the data and information stored in the cloud. (You wouldn’t want the cloud provider to be able to read your information.) The consumer is also responsible for access security, meaning you only give access to those who need it.

Une image contenant table

Description générée automatiquement

You’ll always be responsible for:

* The information and data stored in the cloud
* Devices that are allowed to connect to your cloud (cell phones, computers, and so on)
* The accounts and identities of the people, services, and devices within your organization

The cloud provider is always responsible for:

* The physical datacenter
* The physical network
* The physical hosts

Your service model will determine responsibility for things like:

* Operating systems
* Network controls
* Applications
* Identity and infrastructure

**Cloud Models :**

* **Private cloud :** cloud used by a single entity, organizations have complete control over resources and security. Data is not collocated with other organization’s data. Organization is responsible for hardware maintenance and updates.
* **Public cloud :** is built, controlled and maintained by a third-party cloud provider. With a public cloud, anyone that wants to purchase cloud services can access and use resources.
* **Hybrid cloud :** computing environment that uses both public and private clouds in an inter-connected environment. It can be used to allow a private cloud to surge for increased, temporary demand by deploying public cloud resources.  Adds a layer of security so that users may choose what to keep in the public cloud and what to keep in the private cloud.
* **Multi cloud :** you use multiple cloud providers, to use different features from each one.

**Azure Arc :** is a set of technologies that helps manage your cloud environment. Azure Arc can help manage your cloud environment, whether it's a public cloud solely on Azure, a private cloud in your datacenter, a hybrid configuration, or even a multi-cloud environment running on multiple cloud providers at once.

**Azure VMware solution :** Azure VMware Solution lets you run your VMware workloads in Azure with seamless integration and scalability, if you are already established with VMware in a private cloud environment but want to migrate to a public or hybrid cloud.

**Describe the consumption based model :**

Two types of expenses to consider, Capital expenditure (CapEx) and operational expenditure (OpEx).

* **CapEx :** is typically a one-time, up-front expenditure to purchase or secure tangible resources. A new building, repaving the parking lot, building a datacenter, or buying a company vehicle are examples of CapEx.
* **OpEx :** it is spending money on services or products over time. Renting a convention center, leasing a company vehicle, or signing up for cloud services are all examples of OpEx.

Cloud computing falls under **OpEx** because cloud computing operates on a consumption-based model. With cloud computing, you don’t pay for the physical infrastructure, the electricity, the security, or anything else associated with maintaining a datacenter. Instead, you pay for the IT resources you use. If you don’t use any IT resources this month, you don’t pay for any IT resources.

***Benefits :***

* No upfront costs.
* No need to purchase and manage costly infrastructure that users might not use to its fullest potential.
* The ability to pay for more resources when they're needed.
* The ability to stop paying for resources that are no longer needed.
  + Plan and manage your operating costs ;
  + Run infrastructure more efficiently ;
  + Scale as your business needs change ;

**Benefits of using Cloud Services :**

* **High availability :** focus on ensuring maximum availability, regardless of disruptions or events that may occur. Azure is a highly available cloud environment with uptime guarantees depending on the service. These guarantees are part of the service-level agreements (SLAs).
* **Scalability :** ability to adjust resources to meet demand.
  + **Vertical scaling :** increase or decrease the capabilities of resources.
  + **Horizontal scaling :** adding or substracting the number of resources.
* **Reliability :** ability of system to recover from failure and continue to function. Cloud enables you to have resources deployed in regions around the world.
* **Predictability :** lets you move forward with confidence. Can be focused on performance or cost predictability.
  + **Performance predictability :** autoscaling(scale when demand grows/drops), load balancing, HA.
  + **Cost predictability :**  is focused on predicting or forecasting the cost of the cloud spend.

**Benefits of security and governance in the cloud :**

***Cloud features*** support governance and compliance. Things like set templates help ensure that all your deployed resources meet corporate standards and government regulatory requirements***. Cloud-based auditing*** helps flag any resource that’s out of compliance with your corporate standards and provides mitigation strategies. Depending on your operating model, software patches and updates may also automatically be applied, which helps with both governance and security.

If you want patches and maintenance taken care of automatically PAAS or SAAS deployments may be the best cloud strategies for you.

**Benefits of manageability in the cloud :**

**Management of the cloud :** « speaks on managing your cloud resources »

* Automatically scale resource deployment based on need.
* Deploy resources based on a preconfigured template, removing the need for manual configuration.
* Monitor the health of resources and automatically replace failing resources.
* Receive automatic alerts based on configured metrics, so you’re aware of performance in real time.

**Management in the cloud :** « how you’re able to manage your cloud environment and resources »

* Through a web portal.
* Using a command line interface.
* Using APIs.
* Using PowerShell.

**IAAS :** most flexible category of cloud services, as it provides you the maximum amount of control for your cloud resources.

* Cloud provider is responsible for maintaining the hardware, network connectivity, and physical security.
* You are responsible for operating system installation, configuration, and maintenance; network configuration; database and storage configuration; and so on.

**PAAS :** provide a complete dev environment without the headache of maintaining all the dev infra.

* Cloud provider maintains
  + the **physical infrastructure**,
  + **physical security**,
  + **connection to the internet**.
  + **the operating systems**,
  + **middleware**,
  + **development tools**,
  + **business intelligence services.**

In a PaaS scenario, you don't have to worry about the licensing or patching for operating systems and databases.

**SAAS :** is the most complete cloud service model from a product perspective. With SaaS, you’re essentially renting or using a fully developed application. Email, financial software, messaging applications, and connectivity software are all common examples of a SaaS implementation.

* The cloud provider is responsible for physical security of the datacenters, power, network connectivity, and application development and patching.
* You ’re responsible for the data that you put into the system, the devices that you allow to connect to the system, and the users that have access.