Day 41

Cloud computing:

A style of computing in which scalable and elastic IT-enabled capabilities are delivered as a service using Internet technologies.

Scalability vs. elasticity

What is scalability?

Scalability refers to enhancing a system's capacity to manage an increased workload effectively. It involves either upgrading the capabilities of existing resources (scaling up) or incorporating additional resources to share the load (scaling out). Scaling up might include boosting memory, processing power, or storage within the current setup.

What is elasticity?

Elasticity is a system's knack for adjusting its resource levels automatically to match the workloads it faces at any moment. This smart adaptation ensures resources are well spent during quiet periods and manageable during spikes in demand.

What is IaaS?

Infrastructure as a service (IaaS) is a type of cloud computing service that offers essential compute, storage, and networking resources on demand, on a pay-as-you-go basis. IaaS is one of the four types of cloud services, along with software as a service (SaaS), platform as a service (PaaS), and serverless.

Advantages of IaaS:

- Lift-and-shift migration
- Test and development
- Storage, backup, and recovery
- Web apps
- High-performance computing
- Reduces capital expenditures and optimizes costs
- Increases scale and performance of IT workloads
- Increases stability, reliability, and supportability
- Improves business continuity and disaster recovery
- Enhances security

What is PaaS?

Platform as a service (PaaS) is a complete development and deployment environment in the cloud, with resources that enable you to deliver everything from simple cloud-based apps to sophisticated, cloud-enabled enterprise applications. You purchase the resources you need from a cloud service provider on a pay-as-you-go basis and access them over a secure Internet connection.

Advantages of PaaS:

- Cut coding time.
- Add development capabilities without adding staff.
- Develop for multiple platforms—including mobile—more easily.
- Use sophisticated tools affordably.
- Support geographically distributed development teams.
- Efficiently manage the application lifecycle.

What is SaaS?

Software as a service (SaaS) allows users to connect to and use cloud-based apps over the Internet. Common examples are email, calendaring, and office tools (such as Microsoft Office 365).

SaaS provides a complete software solution that you purchase on a pay-as-you-go basis from a cloud service provider. You rent the use of an app for your organization, and your users connect to it over the Internet, usually with a web browser. All of the underlying infrastructure, middleware, app software, and app data are located in the service provider's data center. The service provider manages the hardware and software, and with the appropriate service agreement, will ensure the availability and the security of the app and your data as well. SaaS allows your organization to get quickly up and running with an app at minimal upfront cost.

Advantages of SaaS:

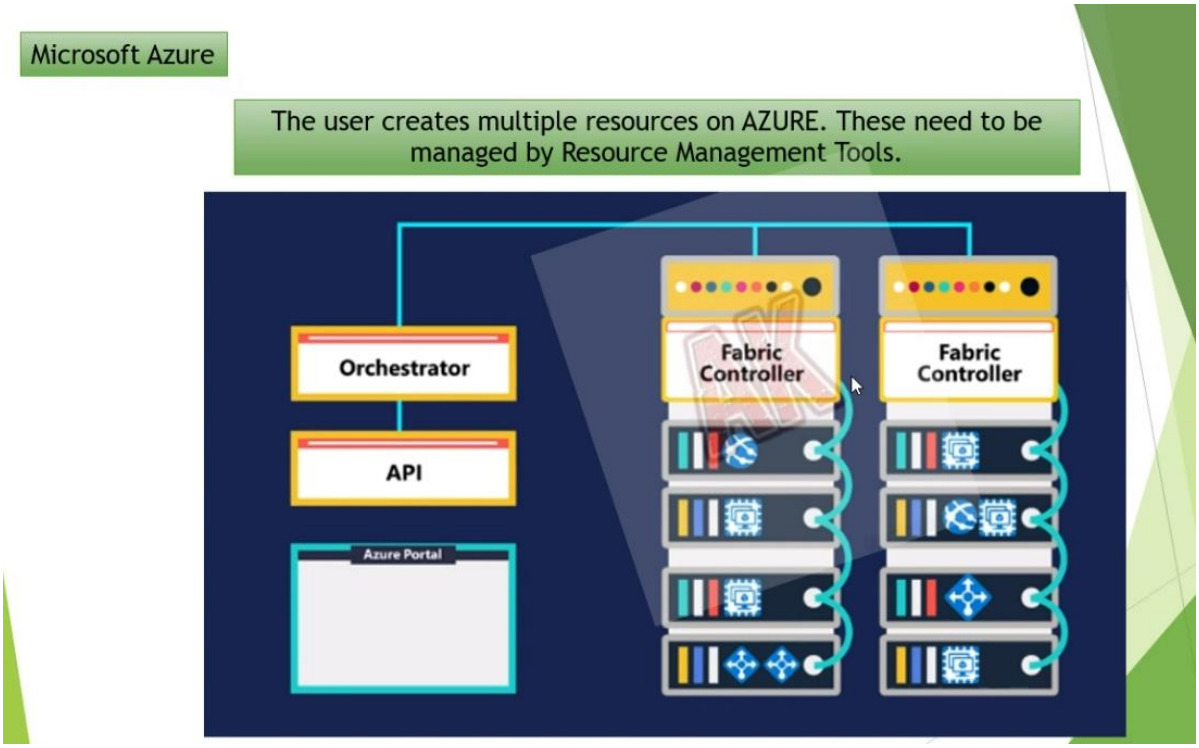
- Gain access to sophisticated applications.
- Pay only for what you use.
- Use free client software.
- Mobilize your workforce easily.
- Access app data from anywhere.

What is a Virtual Machine Manager?

Virtual Machine Manager is also called a Hypervisor.

It's a type of Software that allows us to run an operating system within another operating system Inception.

Microsoft Azure:



User Creation of Resources:

- When users create things like virtual machines or databases in Azure, these resources need to be properly managed to ensure they work efficiently.

Orchestrator:

- The **Orchestrator** plays a key role in organizing and controlling how resources are set up, used, and maintained. It makes sure everything works together smoothly.

API:

- Users interact with Azure through an **API** (Application Programming Interface), which allows them to manage resources (like adding, deleting, or updating them) in an automated way without manually doing everything.

Fabric Controllers:

- **Fabric Controllers** are responsible for managing the physical servers in Azure's data centers. They ensure the resources (servers, storage, etc.) are running correctly, distributing workloads across servers to balance performance and fix issues if a server fails.

Resource Management:

- Together, these tools help manage resources in a large cloud environment. They automatically handle things like scaling up when more resources are needed or redistributing workloads when there's a problem, making sure everything runs efficiently