Cloud Concepts

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Summary

Benefits of Cloud Computing

- Economies of Scale
- Ability to move from a CapEx model to a OpEx model.
- Scalability & Elasticity means you can quickly deploy resources in response to changing demands.
- High Availability & Fault Tolerance

Cloud Computing Models & Responsibilities

- IaaS, PaaS, & SaaS each provide different capabilities and levels of shared responsibility in each. IaaS allows for the most control but comes with the most responsibility from the consumer.

Public, Private, & Hybrid Cloud

- Public cloud is cloud computing that’s delivered via the internet and shared across organizations.
- Private cloud is cloud computing that is dedicated solely to your organization.
- Hybrid cloud is any environment that uses both public and private clouds.

Exam Essentials

High Availability

- Availability of specific resources and is usually backed by an Service Level Agreement (SLA). Reduced performance is not counted as being unavailable.

Scalability

- Enables resources to adjust to changes in demand.

Vertical Scaling

- Adding resources to an existing host such as memory or CPU's.
- Opposite is scaling down.

Horizontal Scaling

- Adding additional systems, such as additional VM's.
- Opposite is scaling in.

Agility

- The capability of quickly deploying services with reduced effort and cost.

Fault Tolerance

- Characteristic of a system that enables it to tolerate the failure of one of its components.

Disaster Recovery

https://docs.microsoft.com/en-us/azure/site-recovery/site-recovery-overview

- Process of recovering systems in the event of a major disaster or failure.

Describe the principles of economies of scale

- Is achieved when a cloud provider is able to purchase large amounts of hardware at discounts and pass those savings down to consumers.

Describe the differences between capital expenditure (CapEx) & operational expenditure (OpEx)

CapEx

- Hard assets such as IT equipment.

OpEx

- Incurred while operating a business such as monthly subscriptions.

Describe the consumption based model

- An organization pays for the resources the organization and its users consume, generally resulting in some savings.

Describe Infrastructure-as-a-Service (IaaS)

https://azure.microsoft.com/en-us/overview/what-is-azure/iaas/

- Refers to compute, networking, & related services that your organization consumes from a pool of resources. VM's, OS's, etc

Describe Platform-as-a-Service (PaaS)

- A system that allows an organization to quickly develop and deploy applications. The cloud provider manages all the underlying hardware and infrastructure requirements required by the application.

Describe Software-as-a-Service (SaaS)

- Model in which organizations consume software from a cloud provider. Cloud provider manages the application and updates. Microsoft 365 is an example.

Compare & contrast the three different service types

- **IaaS** is generally tied to virtualization and the ability to quickly deploy VMs with consumer control on the OS and applications running on the VM.
- **PaaS** abstracts the hardware and middleware and instead focuses on the interaction between the consumer and the service, simplifying the capability to consume development-related services.
- **SaaS** fully abstracts the hardware and application support allowing users to simply use the application without managing anything else.

Describe a public cloud

- Services are provided to multiple organizations through a public medium such as the internet.
- Compute & networking hardware are shared between organizations.

Describe a private cloud

- Services are provided to a single organization whether managed internally or through a third part.

- Offer greater control over resources.

Describe a hybrid cloud

- Non-cloud services hosted directly on premise directly interact with either a private or public cloud.