INTRODUCTION TO CLOUD COMPUTING

MODULE: APPLICATION DEVELOPMENT 3A

LEARNING OBJECTIVES

- Introduction to Cloud Computing
  - What is the Cloud Computing?
  - What are the characteristics of Cloud Computing?
  - What are the Cloud Computing service models?
  - What are the advantages of Cloud Computing?
  - What are the four deployment models for Cloud Computing?

WHAT IS CLOUD COMPUTING?

- Cloud Computing can be thought of as anything that involves delivering hosted services over the Internet.
- According to NIST (The National Institute of Standards and Technology) “cloud computing is a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction.” (Special Publication 800-145)

WHAT ARE THE CHARACTERISTICS OF CLOUD COMPUTING?

- *On-demand self-service*

  A user can provision computing capabilities automatically without requiring human interaction with each service provider. For example server time and network storage.

- *Broad network access*

  Services and resources are accessible on a wide range of devices and platforms such as such as tablets, PCs, Macs and smartphones.

- *Resource pooling*

  Resources are pooled to serve multiple consumers and can be dynamically assigned and reassigned according to demand. Clients may not care where their resources are physically located but should be aware of risks if they are located offshore.

WHAT ARE THE CHARACTERISTICS OF CLOUD COMPUTING?

- *Rapid elasticity*

  Services can be provisioned or released in order to scale as demand increases or decreases. To the client, the provisioning appears to be unlimited and can be appropriated in any quantity at any time.

- *Measured service*

  The provider automatically controls and optimize resource use by leveraging a metering capability at some level of abstraction appropriate to the type of service. Resource usage can be controlled, monitored and reported, providing transparency to the client.

WHAT ARE THE CLOUD COMPUTING SERVICE MODELS?

SaaS
Software as a Service
(Consume)

PaaS
Platform as a Service (Build)

IaaS
Infrastructure as a Service
(Host)

DIFFERENCE BETWEEN ON-PREMIS, IAAS, PAAS & SAAS

On-Premise	IaaS	PaaS	SaaS
Applications	Applications	Applications	Applications
Data	Data	Data	Data
Runtime	Runtime	Runtime	Runtime
Middleware	Middleware	Middleware	Middleware
O/S	O/S	O/S	O/S
Virtualisation	Virtualisation	Virtualisation	Virtualisation
Servers	Servers	Servers	Servers
Storage	Storage	Storage	Storage
Network	Network	Network	Network

INFRASTRUCTURE AS A SERVICE (HOST)

- This service model allows the client access to basic infrastructure used to support operations including full operating system access, firewalls, routers and load balancers.
- The provider owns the infrastructure equipment.
- The client pays on a per-use basis.
- Examples: DigitalOcean, Linode, Rackspace, Amazon Web Services (AWS), Cisco Metapod, Microsoft Azure, Google Compute Engine (GCE).

PLATFORM AS A SERVICE (BUILD)

- PaaS facilitates allow organisation to develop applications without the cost and complexity of buying and managing the underlying hardware and software.
- As demand increases these servers need to be scaled.
- Popular usages scenarios include: Storage, Database, Scalability
- Examples: AWS Elastic Beanstalk, Windows Azure, Heroku, Force.com, Apache Stratos.

SOFTWARE AS A SERVICE (CONSUME)

- Popular with small and medium size enterprises.
- No hardware or software to manage.
- Services are available to the customer for a fee, pay-as-you-go, or a no charge model.
- The customer accesses the applications over the internet.
- Examples: Office 365, SAGE One, Google Apps, CRM, Financial Planning, Human Resources, Dropbox, MailChimp, ZenDesk, DocuSign, Slack, Hubspot.

WHAT ARE THE ADVANTAGES OF CLOUD COMPUTING?

- Cloud computing providers have flexible payment modules.
- By using cloud infrastructure, you don't have to spend huge amounts of money on purchasing and maintaing equipment. This drastically reduces capex costs.
- Applications and services can be scaled instantly.
- International best practices are used to secure the environment. Cloud environments are more secure than traditional environments.
- Build in redundant infrastructure make the cloud reliable: Most of the cloud providers are truly reliable in offering their services, with most of them maintaining an uptime of 99.9%
- Access to services via an APIs.
- Reduced carbon footprint.

WHAT ARE THE FOUR DEPLOYMENT MODELS FOR CLOUD COMPUTING?

- **Private**: Cloud infrastructure is operated and managed solely for an organisation. In a private cloud, a business has access to infrastructure in the cloud that is not shared with anyone else. It can be managed by the organisation or a third party and may exist on premise or off premise.
- **Community**: Cloud infrastructure shared by several organisations that support a specific community that has shared concerns. The community model is a variation on the private cloud model. Community clouds are an attractive option for companies in the health, financial or legal spheres that are subject to strict regulatory compliance.
- **Public**: Cloud infrastructure is made available to the general public or a large industry group and is owned by an organisation selling cloud services.
- **Hybrid**: A combination of two or more deployment models above. In a hybrid cloud model, a company's cloud deployment is split between public and private cloud infrastructure.