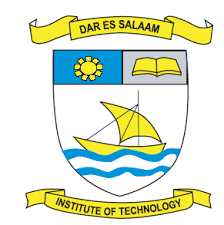
DAR ES SALAAM INSTITUTE OF TECHNOLOGY (DIT).



DEPARTMENT: COMPUTER STUDIES DEPARTMENT.

MODULE: CLOUD COMPUTING.

MODULE CODE: .

CLASS: OD22-IT.

DISCUSSION.

GROUP MEMBERS:

|  |  |  |
| --- | --- | --- |
| S/N | NAMES | REGISTRATION NUMBER |
| 1. | IRENE PETRO BIRRO | 220229323424 |
| 2. | AISHA ABDULRAHIM ABDUL-AZIZ | 220229374492 |
| 3. | SAWIYA SAYID SALIM | 220229358370 |

**LIFE BEFORE CLOUD COMPUTING**

Before cloud computing was invented, traditional methods were being used to store, retrieve and access data. The traditional methods include **physical storage devices** (such as hard drive, local servers and on-premises infrastructures.)

This approach required sufficient upfront cost, ongoing maintenance and limited scalability as it would require the organizations to employ various employees from different sectors such as IT in order to maintain and repair the devices.

These requirements of this approach are;-

**Client-Server Architecture:**

Before cloud computing, the prevalent model was client-server architecture. In this setup, data and control resided on the server side. When a user needed to access data, they had to connect to the server to gain appropriate access. However, this approach had several disadvantages1.

Disadvantages:

* Centralized Control: All data and control were concentrated on the server, leading to potential bottlenecks and single points of failure.
* Network Dependency: Users had to be connected to the server to access data, which limited mobility and flexibility.
* Resource Allocation: Servers needed to allocate resources for each client, which could be inefficient.

Distributed Computing:

* To address some of the limitations of client-server architecture, distributed computing emerged. In this model, multiple computers were networked together, allowing users to share resources when needed. However, distributed computing also had its own limitations1.

Limitations:

* Complexity: Managing a network of interconnected computers required significant effort and expertise.
* Scalability: Scaling distributed systems was challenging due to coordination and synchronization issues.
* Resource Sharing: Resource allocation across the network was not always efficient.

**LIFE AFTER CLOUD COMPUTING**

Organizations can handle different types of data with distinct accessibility and governance requirements.

For instance, an e-commerce business might keep product information on a public cloud system (like AWS or Azure) for global availability. Simultaneously, sensitive customer data could be securely stored in an on-premise private cloud.

**Scalability and Flexibility:**

Cloud computing allows organizations to scale their infrastructure up or down based on demand.

Traditional data centers required significant upfront investment in hardware and capacity planning. With the cloud, businesses can easily adjust resources as needed.

Whether it’s handling seasonal spikes in e-commerce traffic or accommodating sudden growth, cloud services provide flexibility.

**Cost Efficiency:**

Cloud computing shifts the cost model from capital expenditure (CapEx) to operational expenditure (OpEx).

Organizations pay for what they use, avoiding large upfront costs for hardware and maintenance.

Additionally, cloud providers offer pay-as-you-go pricing, which is especially beneficial for startups and small businesses.

**Global Accessibility:**

Cloud services are accessible from anywhere with an internet connection.

Teams can collaborate seamlessly across geographies, improving productivity.

Users can access applications, data, and services without being tied to a specific physical location.

**Security and Compliance:**

Cloud providers invest heavily in security measures.

Encryption, access controls, and compliance certifications enhance data protection.

However, organizations must still manage their own security practices and ensure compliance with industry regulations.

**Service Models:**

Cloud computing offers three primary service models:

Infrastructure as a Service (IaaS): Provides virtualized computing resources (servers, storage, networking).

Platform as a Service (PaaS): Offers development platforms and tools for building and deploying applications.

Software as a Service (SaaS): Delivers ready-to-use software applications over the internet (e.g., Gmail, Office 365).

**DevOps and Continuous Integration/Continuous Deployment (CI/CD):**

Cloud adoption has accelerated DevOps practices.

CI/CD pipelines automate software delivery, enabling faster releases and better quality control.

Developers can focus on code, while the cloud handles deployment and scaling.

**Serverless Computing:**

Serverless architectures allow developers to write code without managing servers.

Functions are executed in response to events (e.g., HTTP requests, database changes) without provisioning servers explicitly.

This approach reduces operational overhead and improves resource utilization.

With examples describe cloud computing services.

Cloud computing services are type of online computing allowing users to access and use resources & applications over the internet.

**Software-as-a-Service (SaaS):**

SaaS products distribute data online and are accessible from a browser on any device. Companies can continue to host the software without worrying about managing hardware, software, storage, or other infrastructure components.

* Salesforce: A well-known SaaS provider, Salesforce offers a CRM tool that helps businesses manage customer relations and generate sales leads. The platform combines AI and customer data to enhance sales team performance.
* Zoom: A cloud-based video conferencing platform that records meetings and saves them to the cloud. Users can access recorded meetings anytime, anywhere. Ally Financial, Dropbox, and the University of Miami are among Zoom’s customers.

**Infrastructure-as-a-Service (IaaS):**

IaaS provides virtualized computing resources over the internet. Users can rent virtual machines, storage, and networking components.

* DigitalOcean: A popular IaaS provider that offers scalable cloud infrastructure for developers. It allows users to create and manage virtual servers (droplets) with ease.

**Platform-as-a-Service (PaaS):**

PaaS provides a platform for developers to build, deploy, and manage applications without worrying about underlying infrastructure.

* Amazon Web Services (AWS): A leading PaaS provider that offers a wide range of services, including compute, storage, databases, and machine learning. Developers can focus on coding while AWS handles the infrastructure.