



COMPUTER SCIENCE DEPARTMENT

Total Marks: 04

Obtained Marks: _____

Cloud Computing

Assignment # 01

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Assignment 1: Describe the history and evolution of cloud computing

Statement:

Describe the history and evolution of cloud computing. Discuss key milestones, starting from the early concepts of time-sharing and virtualization in the 1960s to the development of modern cloud platforms like Amazon Web Services (AWS), Microsoft Azure, and Google Cloud. How have these milestones shaped the current landscape of cloud computing?

Answer:

Cloud computing has really transformed since it was first developed during the 1960s. This transformation is attributed to technological advancements and evolution of user demand. The essay discusses part of the history of its development and any remarkable changes.

- **Preliminary Thoughts (1960s)**

- **Time-sharing:** It was first introduced in the 1960s which allowed multiple users to run concurrently on one mainframe computer. It was IBM and the Massachusetts Institute of Technology that initiated this concept and laid down the entire ground work of resource sharing.
- **Virtualization:** The next development done by IBM was virtualization technology that allowed operating on a hardware platform by multiple operating systems. It drastically minimized the underutilization of resources and worked as an excellent precursor for the future cloud technologies.

- **Formation of a computer network (1970s-1980s)**

- Development of ARPANET. Communication between diverse types of computers aided in the advancing of networking. Hence, this contributed towards the development of distributed computing and laid the foundation of the internet we see today.
- **A Client-Server Architecture:** The client-server model became popular late in the 1980s. Clients could request services from centralized servers. The architecture was very efficient and became a precursor to cloud computing services.

- **Internet and Application Service Providers (1990s)**

- **The Internet Boom:** Internet commercialization in the early 1990's easily made room for online services to find their ground. It eventually led businesses to host applications and services on remote servers and eventually spread to the creation of Application Service Providers (ASPs).
- The ASP model facilitated the provision of software applications to businesses via the internet, thereby enabling them to access software without the

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requirement of local installation. This model laid the groundwork for subsequent cloud service models.

- **The Rise of Cloud Computing (2000s)**

- The idea of cloud computing seemed to be in the air as the companies and researchers were working tirelessly gaining momentum to the cause.
- **Salesforce.com** - a company founded in the year 1999 went ahead to launch its customer relationship management software to as a cloud-based application.
- **Amazon Web Services: 2006:** This development consisted of AWS and EC2 offering the elastic compute cloud service which is 'pay as you go'. This opened a new chapter where businesses began offering cloud services and did not have to invest in infrastructure.

- **Globalization and Growth (2010s)**

- These are meant for different types of clients and the platforms now include IaaS, PaaS and SaaS.
- In 2010, Microsoft released the Azure cloud which starts as a service that is seemingly aimed at cloud computing as a realistic business model featuring an impressive range of services including computing, analytics and storage.
- **Google Cloud Platform: 2011:** At this point, Google entered the battle with a flair about machine learning and data analytics, in the cloud space increasing competition.

- **Innovations and Mainstream Adoption (2010-2020)**

- **Cloud Models:** Hybrid- In order to attain high performance while keeping the cost minimal, companies began utilizing a hybrid approach that integrates private and public clouds
- **Cloud Security:** The era of data breaches prompted organizations to further invest in security enhancements and compliance with privacy regulations like GDPR and HIPAA.
- **Cloud Evolution:** Serverless computing such as AWS Lambda came about allowing developers to operate applications without handling the underlying infrastructure. Edge computing gained popularity for the need to minimize latencies by processing data nearer to the origins.

- **Transformation and Future Focus Areas (2020-todate)**

- **Cloud-based AI and ML services:** More and more cloud service providers are coming up with AI and machine learning based services so that enterprises can utilize automation and advanced analysis.



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- **Climate Change Responsiveness:** The large cloud service providers have already pledged to stop climate change, with ambitions to power their data centers with green energy and minimize emissions.
- **Increased adoption of cloud computing technologies in developing economies:** The trend goes on, the cloud market expands all over the world, with the developing economies adopting advanced cloud technologies for enhancing their IT infrastructure.

Conclusion

When one looks through the history of cloud computing, one can see that it has been a process of progression thanks to the development of technology and different business requirements. Starting from the concepts of the Time-Sharing systems and up to AWS, Azure, and Google Cloud, these markers have redesigned the IT infrastructure making it elastic, agile and revolutionary in different spheres. Today, the cloud computing environment is more applicable to various service models, is service-oriented, places emphasis on security, and is the environment within which new technologies are embedded, thus defining business processes in the modernization era.