A Technical Seminar Report On

CLOUD COMPUTING

Submitted in partial fulfilment of the requirements for the award of the degree of

Bachelor of Technology

In

Electronics and Communication Engineering

Submitted by

HARSHA DEVARA

(20P31A04J4)

Under the esteemed guidance of

Mr. T. ANJAIAH M. Tech (Ph. D)

Associate Professor

ADITYA COLLEGE OF ENGINEERING & TECHNOLOGY (A)

(Approved by AICTE, New Delhi & Affiliated to JNTUK, Kakinada)

Surampalem, East Godavari District

Andhra Pradesh – 533 437

2020-2024

ADITYA COLLEGE OF ENGINEERING & TECHNOLOGY(A)

(Approved by AICTE, New Delhi & Affiliated to JNTUK, Kakinada)

Department of Electronics and Communication Engineering

CERTIFICATE

This is to certify that the **Technical Seminar** report entitled, **"Cloud Computing",** is a bonafide work carried out by **Harsha Devara(20P31A04J4)** in partial fulfillment of the requirements for the award **of the degree of BACHELOR OF TECHNOLOGY** in **Department of Electronics and Communication Engineering** from **ADITYA COLLEGE OF ENGINEERING AND TECHNOLOGY,** Surampalem, during the academic year 2023-2024.

This Technical Seminar work has not been submitted in full or part to any other University or educational institute for the award of any degree or diploma.

Project Guide
Mr. T. ANJAIAH., M. Tech, (Ph. D).
Associate Professor
Dept. of ECE

Head of the Department
Dr. R. V. V. KRISHNA, M. Tech, Ph.D.
Professor & HOD
Dept. of ECE

DECLARATION

We are hereby declaring that the entire project work embodied in this dissertation entitled "**CLOUD COMPUTING**" has been independently carried out by us. As per our knowledge, no part of this work has submitted for any degree in any institution, university, and organization previously.

Yours sincerely,

Harsha Devara (20P31A04J4)

ACKNOWLEDGEMENT

It gives us immense pleasure to express a deep sense of gratitude to my guide **Mr. T. ANJAIAH, M. Tech, (Ph. D)** Associate Professor, Department ECE, for his valuable guidance and encouragement which has been helpful in successful completion of this Project.

We would like to sincerely thank our Head of the department **Dr. R V V Krishna, M.Tech., Ph.D** for providing all the necessary facilities that led to the successful completion of our project work.

We would like to take this opportunity to thank our beloved Principal **Dr. Dola Sanjay S**, **M.Tech., Ph.D** for providing all the necessary facilities and a great support to us in completing the project work.

We would like to thank **all the faculty members** and the **non-teaching staff** of the Department of Electronics and Communication Engineering for their direct or indirect support for helping us in completion of this project work.

Finally, we would like to thank all our **friends** and **family members** fortheir continuous help and encouragement.

Harsha Devara

(20P31A04J4)

INSTITUTE VISION AND MISSION

VISION:

To induce higher planes of learning by imparting technical education with

- International standards
- Applied research
- Creative Ability
- Value based instruction and to emerge as a premiere institute

MISSION:

Achieving academic excellence by providing globally acceptable technical education byforecasting technology through

- Innovative Research and development
- Industry Institute Interaction
- Empowered Manpower

PRINCIPAL

PRINCIPAL
Aditya College of
Engineering & Technology
SURAMPALEM- 533 437

DEPARTMENT VISION AND MISSION

Vision: To emerge as a centre of excellence in education and research

Mission:

- To establish skill and learning centric infrastructure in thrust areas
- To develop Robotics and IOT based infrastructure Laboratories
- To organize events through industry institute collaborations and promote innovation
- To disseminate knowledge through quality teaching learning process.

Head of the Department

Head of the Department
Dept. of ECE
Aditya College of
Engineering & Technology
SURAMPALEM 533 437

PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

Program Name: Bachelor of Technology (B. Tech) in Electronics and Communication Engineering.

PEO1: Graduates shall evolve into skilled professionals capable of handling interdisciplinary work atmosphere and excel in problem solving.

PEO2: Graduates shall inculcate the urge to progress in the chosen field of Electronics & Communication through higher education and research.

PEO3: Graduates shall ingrain professional values through Ethics based teaching learning process.

PEO4: Graduates shall exhibit leader ship skills and advance towards Entrepreneurship, Innovation and lifelong learning.

Head of the Department

Head of the Department
Dept. of ECE
Aditya College of
Engineering & Technology
SURAMPALEM 533 437

PROGRAM SPECIFIC OUTCOMES (PSOs)

Program Name: Bachelor of Technology (B.Tech) in Electronics & Communication Engineering

PSO1: Industry ready in the arena of electronics & communication, VLSI, Robotics, Embedded Systems, IOT and allied fields.

PSO2: Acquire the required ability and knowledge to design, test, verify and develop innovative electronics projects through theoretical and laboratory practice.

Head of the Department

Head of the Department
Dept. of ECE
Aditya College of
Engineering & Technology
SURAMPALEM 533 437

PROGRAM OUTCOMES (POs)

PO1. **Engineering Knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems

PO2. **Problem Analysis:** Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3. **Design/Development of Solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4. **Conduct Investigations of Complex Problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5. **Modern Tool Usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.

PO6. **The Engineer and Society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7. **Environment and Sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8. **Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9. **Individual and Team Work:** Function effectively as an individual, and as a member orleader in diverse teams, and in multidisciplinary settings.

PO10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, give and receive clear instructions.

PO11. **Project Management and Finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12. **Life-Long Learning:** Recognize the need for, and have the preparation and ability to engagein independent and life-long learning in the broadest context of technological change.

ADITYA
COLLEGE OF ENGINEERING & TECHNOLOGY
An AUTONOMOUS Institution
Approved by AICTE • Affiliated to JNTUK • Accredited by NBA, NAAC with "A+" Grade
Recognized by UGC under section 2(f) and 12(B) of UGC Act, 1956
Ph: +91 99591 76665
Email: office@acet.ac.in
Website: www.acet.ac.in

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

B. Tech 4/4, II-SEMESTER

Course Outcomes

Upon completion of the course, students will be able to:

CO#	Course Outcomes	Blooms Taxonomy level
CO1	Identify the problem by applying acquired knowledge.	Remember
CO2	Use literature to identify the objective, scope and the concept of the work.	Apply
CO3	Analyze and categorize executable project modules after considering risks.	Analyse
CO4	Choose efficient tools for designing project modules.	Evaluate
CO5	Integrate all the modules through effective team work after efficient testing.	Create
CO6	Explain the completed task and compile the project report.	Understand

CO-PO/PSO MATRIX:

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2
CO1	2	2	2	-	2	-	2	-	3	2	-	-	2	3
CO2	2	2	3	2	-	-	3	2	2	-	-	-	2	3
CO3	2	-	2	2	-	2	-	2	2	-	-	-	2	3
CO4	2	-	-	-	2	2	-	-	-	-	2	-	-	2
CO5	3	-	-	2	2	-	-	-	2	2	-	-	2	2
CO6	2	-	-	-	-	-	-	-	2	2	2	-	-	2
Course														

Signature of the Guide

ABSTRACT

Cloud computing represents a Transformative shift in the way IT services are delivered and consumed. This emerging technology enables users to access a wide range of computing resources, including servers, storage, databases, networking, and software applications, over the internet, without the need for on-premises infrastructure. The key features of cloud computing include on-demand self-service, broad network access, resource pooling, rapid elasticity, and measured service, which collectively offer unprecedented flexibility, scalability, and cost-effectiveness.

Various deployment models, such as public, private, hybrid, and multi-cloud, cater to diverse user requirements and preferences. Public clouds, offered by service providers like Amazon Web Services (AWS), Microsoft Azure, and Google Cloud Platform, deliver resources to multiple users over the internet. Private clouds, on the other hand, are dedicated to a single organization and can be hosted on-premises or by a third-party provider. Hybrid clouds combine the benefits of both public and private clouds, allowing organizations to leverage the scalability of public resources while maintaining sensitive data on-premises.

Despite its numerous benefits, cloud computing also presents challenges, including data security and privacy concerns, compliance issues, and vendor lock-in risks. However, ongoing advancements in cloud security, compliance standards, and interoperability solutions are addressing these challenges and enhancing the overall trust and adoption of cloud technologies.

Looking ahead, cloud computing is poised to continue its rapid growth trajectory, with emerging trends such as edge computing, serverless architectures, and AI-driven automation driving innovation in the space. As businesses and individuals increasingly rely on cloud services for their computing needs, the impact of cloud computing on the economy, society, and technology landscape is expected to be profound, shaping the future of IT infrastructure and services.

INDEX

1. INTRODUCTION

- Cloud computing is a network-based environment that focuses on sharing computations or resources. Clouds are Internet-based, and it tries to disguise complexity for clients. Cloud computing refers to both the applications delivered as services over the Internet and the hardware and software in the datacenters that provide those services. Cloud providers use virtualization technologies combined with self-service abilities for computing resources via network infrastructure. In cloud environments, several kinds of virtual machines are hosted on the same physical server as infrastructure. In cloud, customers must only pay for what they use and not have to pay for local resources which they need to such as storage or infrastructure.

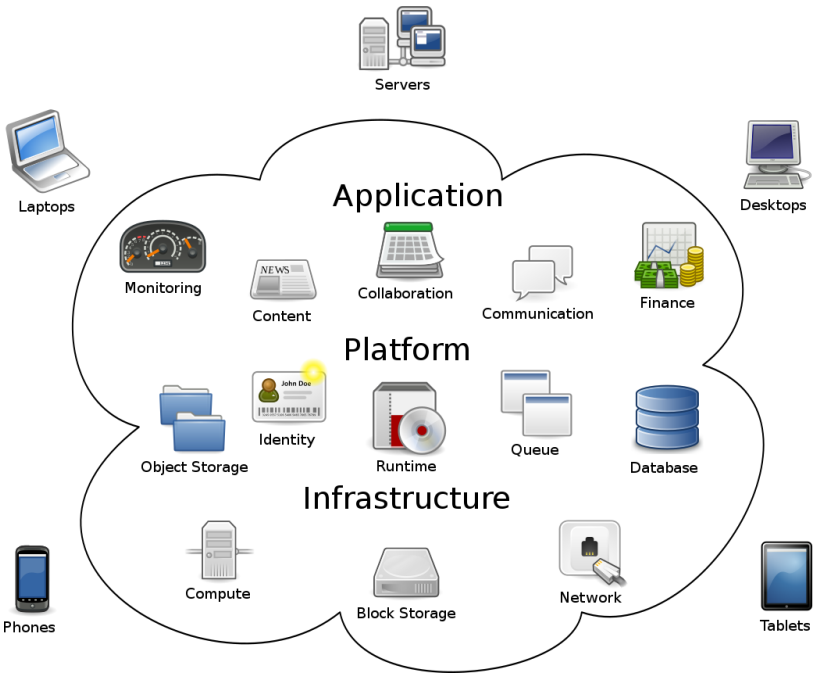


Fig 1.1 cloud computing

2. CLOUD COMPUTING

Cloud computing is the on-demand availability of computing resources (such as storage and infrastructure), as services over the internet. It eliminates the need for individuals and businesses to self-manage physical resources themselves, and only pay for what they use.

The concept of cloud computing traces its roots back to the early days of computing when remote servers were used for centralized processing. However, the term "cloud computing" gained prominence in the mid-2000s as internet connectivity and virtualization technologies advanced. Companies like Amazon, with the launch of Amazon Web Services (AWS), played a pivotal role in popularizing the idea of on-demand access to computing resources.

1999: In this year salesforce.com i.e. delivery of applications through the web was started.
2002: At this time Amazon launched Amazon web services.

2006: Well, Google started Google docs and Amazon-originated Elastic compute cloud.

2008: Eucalyptus was started.

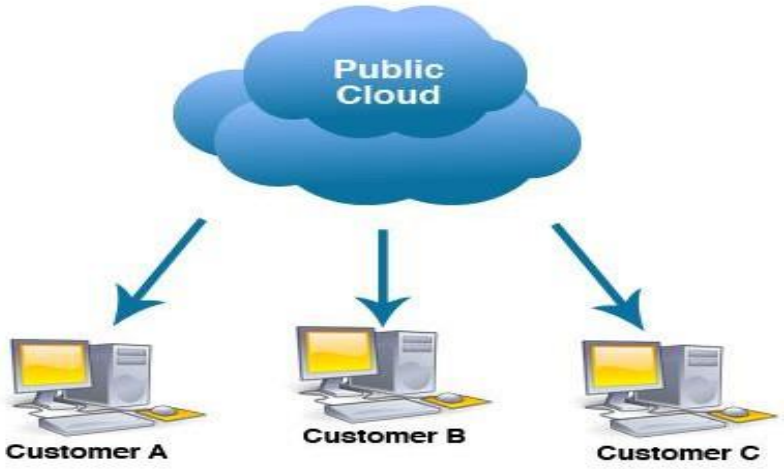
2009: In this year, Microsoft Azure derived.

3. TYPES OF CLOUD COMPUTING

- Public cloud
- Private cloud
- Hybrid cloud

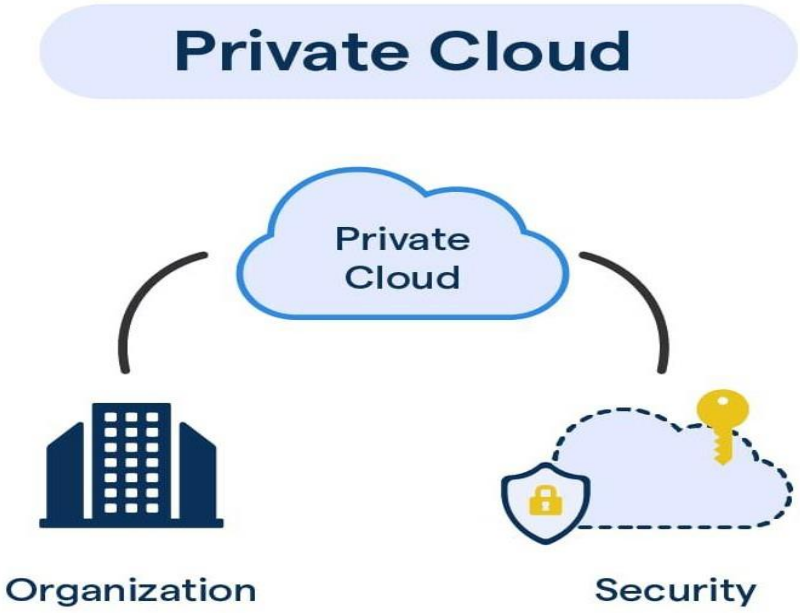
3.1 Public cloud:

A public cloud is a standard model in which providers make several resources, such as applications and storage, available to the public. Public cloud services may be free or not. In public clouds which they are running applications externally by large service providers and offers some benefits over private clouds.



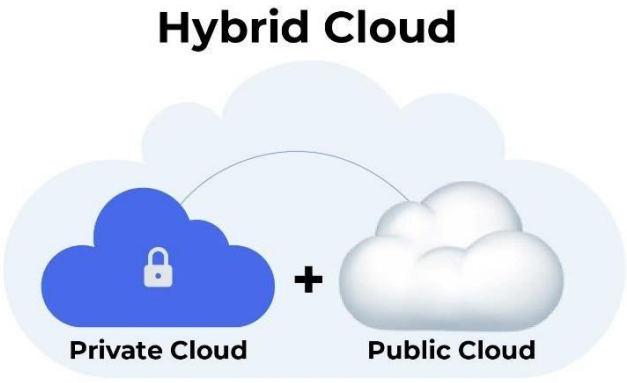
3.2 Private cloud:

Private Cloud refers to internal services of a business that is not available for ordinary people. Essentially Private clouds are a marketing term for an architecture that provides hosted services to particular group of people behind a firewall.



3.3 Hybrid cloud:

Hybrid cloud is an environment where a company provides and controls some resources internally and has some others for public use. Also, there is a combination of private and public clouds that are called Hybrid clouds. In this type, cloud provider has a service that has private cloud part which is only accessible by certified staff and protected by firewalls from outside accessing and a public cloud environment which external users can access to it.



There are three major types of service in the cloud environment: SaaS, PaaS, and laaS. In cloud, similar to every proposed technology, there are some issues which involve it and one of them is RAS factor. For having good and high performance, cloud provider must meet several management features to ensure improving RAS parameters of its service such as:

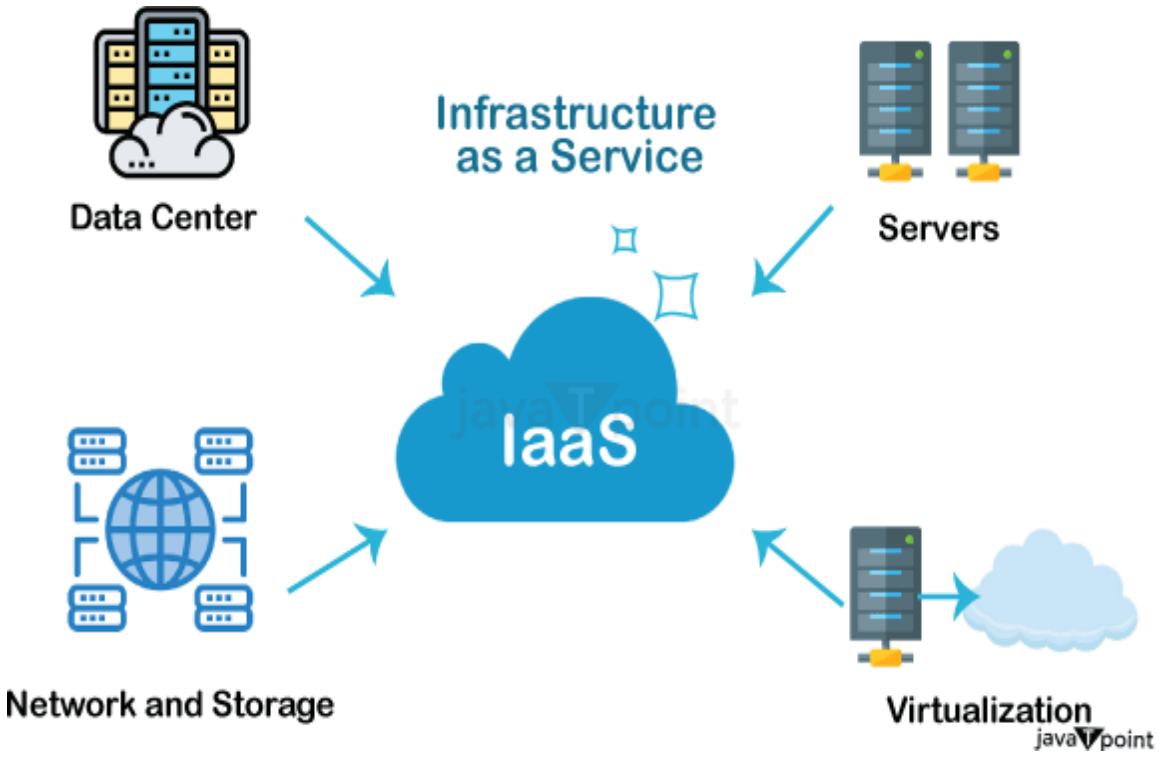
- Availability management
- Access control management
- Vulnerability and problem management
- Patch and configuration management
- Countermeasure
- Cloud system using and access monitoring

Hybrid cloud solutions enable you to migrate and manage workloads between these various cloud environments, allowing you to create more versatile setups based on your specific business needs. Many organizations choose to adopt hybrid cloud platforms to reduce costs, minimize risk, and extend their existing capabilities to support digital transformation efforts.

4. SERVICES OF CLOUD COMPUTING

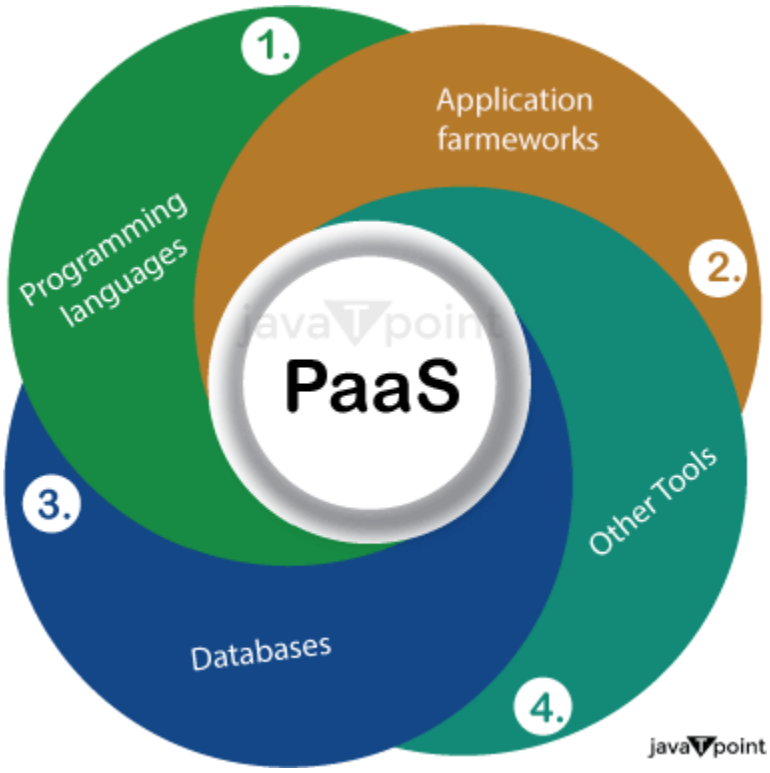
4.1 IAAS:

Iaas is also known as Infrastructure as a Service. It is one of the layers of the cloud computing platform. It allows customers to outsource their IT infrastructures, such as servers, networking, processing, storage, virtual machines, and other resources. Customers access these resources on the Internet using a pay-as-per-use model.



4.2 PAAS:

Platform as a Service (PaaS) provides a runtime environment. It allows programmers to easily create, test, run, and deploy web applications. You can purchase these applications from a cloud service provider on a pay-as-per-use basis and access them using an Internet connection. In PaaS, back-end scalability is managed by the cloud service provider, so end-users do not need to worry about managing the infrastructure.

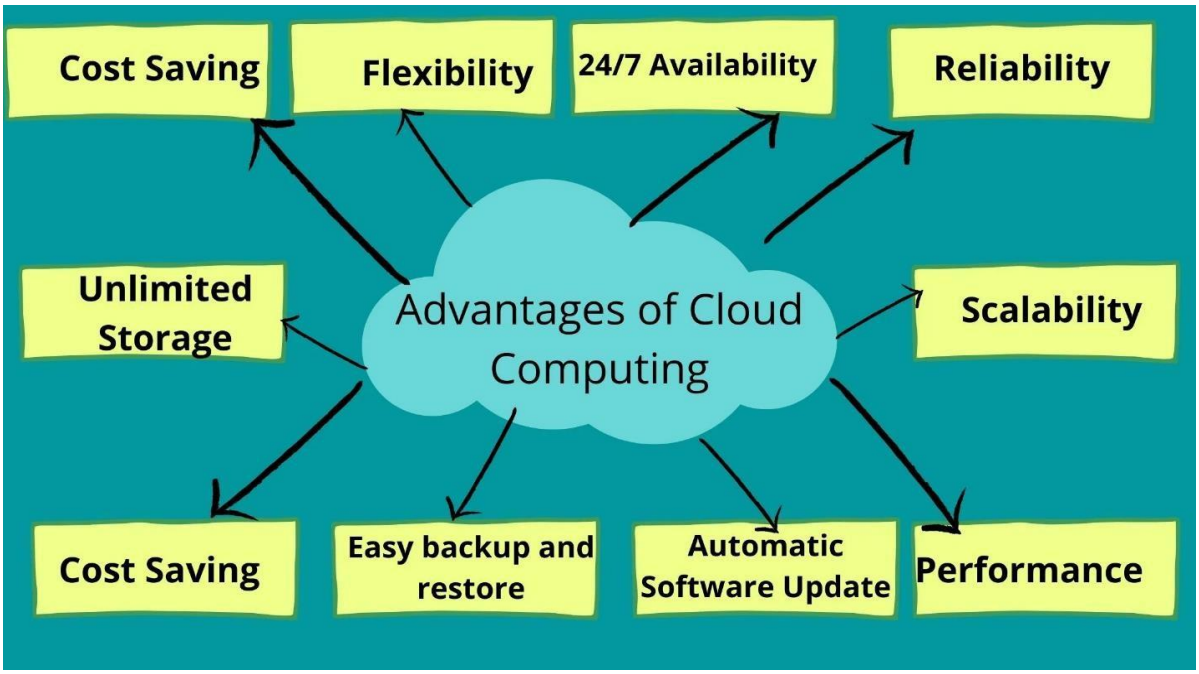


4.2 SAAS:

SaaS is also known as "On-Demand Software." It is a software distribution model in which services are hosted by a cloud service provider. These services are available to end-users over the internet, so the end-users do not need to install any software on their devices to access these services.

5. ADVANTAGES

- Cloud computing is low in cost and affordable because we get the bills as per the usage.
- The storage and maintenance of a large amount of information or data are possible.
- Cloud computing is very flexible.
- It provides high security.
- The option of data recovery is available.
- Data can be managed easily.



- It has an automatic update

6. DISADVANTAGES

1. Dependency: -

   One major disadvantages of cloud computing is user's dependency on the provider.

2. Risk: -

   Cloud computing services means taking services from remote servers.

3. Requires a Constant internet connection: -

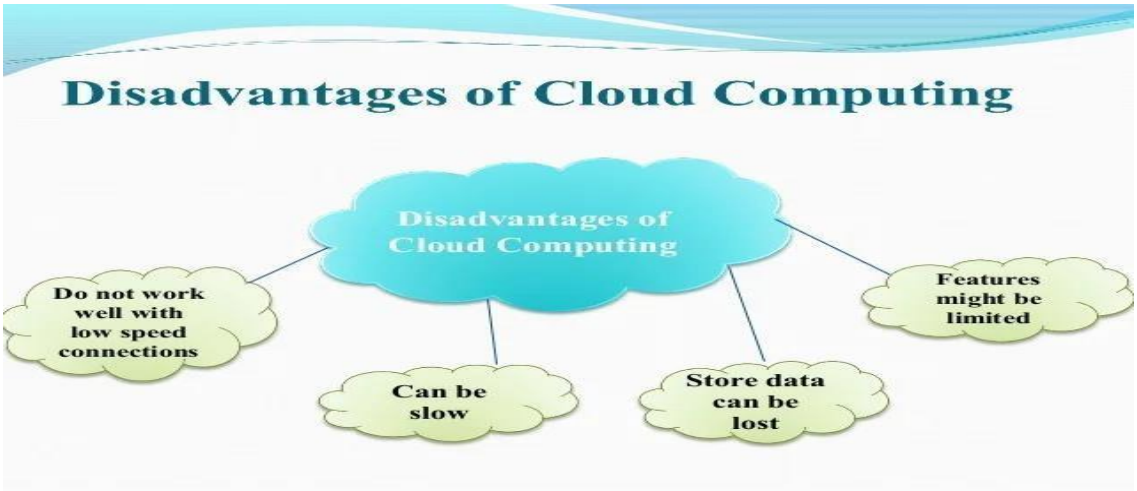
   The most obvious disadvantages is that Cloud computing completely relies on network connections.

4. Security: -

   Security and privacy are the biggest concerns about cloud computing.

5. Migration Issue: -

   Migration problem is also a big concern about cloud computing



7. EMERGING TRENDS

EDGE COMPUTING:

Edge computing refers to the exercise of processing information in the direction of its delivery at the edge of a network, in the region of counting on a centralized cloud or data center. In edge computing, statistics are processed and analyzed locally on devices or in nearby servers, lowering latency and permitting quicker reaction times.Edge computing enhances performance, security, and the capability to manipulate and study information at or close to the beginning, making it a treasured addition to the broader cloud computing atmosphere.

MULTI-CLOUD ADOPTION:

Multi-cloud adoption involves utilizing multiple cloud computing services from different providers. It reduces vendor lock-in, providing organizations with flexibility and negotiation power. Distributing workloads across multiple platforms enhances resilience against downtime. Different providers offer diverse geographic reach, optimizing performance for global users. Cost optimization is achieved by leveraging varied pricing models across providers. Organizations can choose the best-fit solutions for their needs from each provider's offerings. However, managing multiple cloud environments increases complexity and requires expertise. Ensuring seamless data integration and consistent security policies is challenging.

SERVER-LESS COMPUTING:

Server-less computing is a cloud computing model where developers write and deploy code without managing servers. It offers automatic scaling, pay-per-use billing, and event-driven architecture. This model enables faster time-to-market, scalability, and resilience. Serverless functions are triggered by events, facilitating agile and scalable application development. They integrate well with microservices, fostering modular architectures. Overall, serverless computing streamlines development, enhances scalability, and reduces operational overhead.

AI-POWERED CLOUD:

An AI-powered cloud harnesses artificial intelligence and machine learning to enhance cloud services and infrastructure. It offers predictive analytics, automated resource allocation, and proactive maintenance, improving performance and efficiency. AI enhances security through anomaly detection and automated threat response, bolstering data protection. With dynamic scaling and workload optimization, AI-driven clouds ensure optimal resource utilization and cost efficiency. They enable personalized user experiences through tailored recommendations and content delivery. AI algorithms automate repetitive tasks, freeing up resources for strategic initiatives and innovation. Overall, AI-powered clouds revolutionize cloud computing by optimizing operations, enhancing security, and delivering advanced services driven by intelligent insights.

8.CONCLUSION

8.1CONCLUSION

Cloud computing is a powerful new abstraction for large scale data processing systems which is scalable, reliable and available. In cloud computing, there are large self-managed server pools available which reduces the overhead and eliminates management headache. Cloud computing services can also grow and shrink according to need. Cloud computing is particularly valuable to small and medium businesses, where effective and affordable IT tools are critical to helping them become more productive without spending lots of money on in-house resources and technical equipment. Also, it is a new emerging architecture needed to expand the Internet to become the computing platform of the future.

8.2FUTURE OUTLOOK

The future of cloud computing is poised for further advancements in edge computing, Al and machine learning, hybrid cloud, and server-less architecture, shaping the next phase of digital transformation for businesses.