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Cloud Computing – On-Demand Computing Services via the Internet

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ABSTRACT: One kind of technology that gives you access to computer resources like servers is cloud computing. storage, and apps over the Internet whenever you need them. Without the need for local infrastructure, it is possible to save money, use resources more effectively, and scale up. The system supports dynamic resource allocation to keep reliability and performance high. Security measures like authentication and encryption make sure that data is safe. Cloud computing makes things more flexible, useful, and easy to access, all things considered.

KEYWORDS: cloud computing, on-demand services, data security, scalability, and managing resources.

I. INTRODUCTION

Making it feasible to access computer resources over the Internet in a way that is efficient and scalable without requiring local infrastructure is one of the primary objectives of cloud computing. It saves money and increases flexibility by guaranteeing consumers' access. When necessary, access resources such as servers, storage, and applications.

Cloud computing supports IaaS, PaaS, and SaaS models, which let users use resources as they need them. However, issues like resource allocation, load balancing, data security, and service reliability must be resolved because users have diverse needs and the contexts are remote.

Techniques for managing resources effectively are employed to circumvent these concerns and maintain low costs and high performance. Two security procedures that safeguard data and provide consumers with piece of mind are encryption and authentication.

Considering everything, cloud computing is a dependable, scalable, and secure method of offering computer services via the Internet.

II. SYSTEM MODEL AND ASSUMPTIONS

It considers a cloud computing environment where N users submit service requests and many distributed data centres use the Internet to provide resources. The available resources consist of M virtual machines (VMs) of different capacities. Resource distribution is regulated at set intervals to ensure efficient use.

Before running a job, the system makes a secure connection and picks the right virtual machine (VM) based on what the user needs. Scheduling algorithms help with load balancing and task distribution on servers. To ensure that prevent overload, the system monitors the application of resources and modifies their allocation.

Lightweight control messages also make it possible for users and resources to quickly work together. Instead of one server, several servers that are dispersed out provide fault tolerance and reliability. If one server is down, tasks are moved to another one. This approach ensures that services are constantly accessible, that resources are used efficiently, and that the system may expand in cloud computing.



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III. EFFICIENT COMMUNICATION

Every request, from a user is checked to see what computer power is needed to complete the task. The system looks at the workload and performance needs. It then picks the virtual machines or VMs to use. Tasks are given to machines or VMs using a special resource allocation system. This system aims to make tasks finish quickly as possible. Additionally, it attempts to maximise the utilisation of computer resources. The goal is to minimise the time it takes to complete tasks. The system wants to maximise the use of resources. A metric to examine the channel idleness. Furthermore, failures in the sensing of primary users are assumed to cause the collisions among the transmissions of primary users and CR-Networks nodes. Here, each request made by a user will be assigned to appropriate virtual machines according to their requirement. Scheduling techniques will be applied to allocate resources such that minimum time of completion will be achieved. Load balancing will also be considered during the process. Suppose we have M number of virtual machines having varying processing capacities, with p being processing power. The efficiency of using resources will be calculated within a period t using the formula $E = p \times t$. Additionally, allocating resources dynamically will be beneficial. avoid overloading and degrade performance.

IV. SECURITY

Information security is vital in cloud computing environments due to the enormous amounts of data generated, transmitted, and processed in such environments. This includes application data, transaction logs, organizational data, and personal data. In order to safeguard these records against any forms of attack and maintain the trust of users, the data must be protected at all costs.

Different forms of data security risks for cloud computing include:

1. Unauthorized Access: Attackers may attempt to gain access to cloud account, database, or services in an attempt to obtain sensitive information. The prevention against such attacks can be achieved through effective access and authentication controls.
2. Data Breach: As cloud systems store lots of information, they become possible victims of attackers. The protection of information transfer and storage can be provided by encryption methods.
3. Insider Risks: Security breaches or leaks can occur due to authorised users misusing their privileges. Effective access and monitoring practices reduce the associated risks.
4. Denial of Service (DoS): Such types of attacks involve sending lots of requests to cloud servers to enable them too unavailable. They are addressed through load and traffic management methods.
5. Data Loss: The failure of the system or accidental deletion could lead to data loss. Data loss can be prevented through the application of data backup and recovery mechanisms.
6. Insecure APIs: Attacks regarding cloud computing could occur due to weak application programming interfaces (APIs). Secure API creation is necessary for authentication.
7. Hijacking of Accounts: By obtaining login credentials, attackers can access the user's account. Multi-factor authentication can prevent such attacks.

Encryption, authentication, monitoring, and data backup are some of the measures that cloud computing systems utilize to prevent these attacks.



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V. RESULT AND DISCUSSION

In Fig. 1, the graph represents the relationship between simulation time and resource utilisation in a cloud setting. Utilisation of resources shows how well computing resources, including memory, CPU, and storage are used. The graph shows that as time increases, efficient Allocating resources and balancing load improve overall utilization.

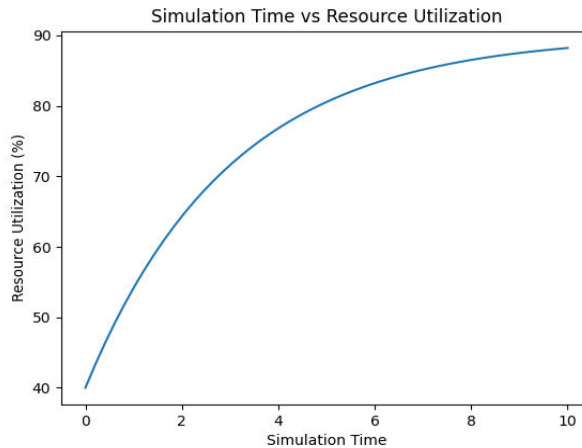


Fig. 1: Simulation time vs Resource Utilization in Cloud Computing

In Fig. 2, it shows the graph of simulation time vs system response time. Response time refers to the time taken by the cloud system to respond to user requests. With better Resource and scheduling management, the response time decreases over time, improving system efficiency and user experience.

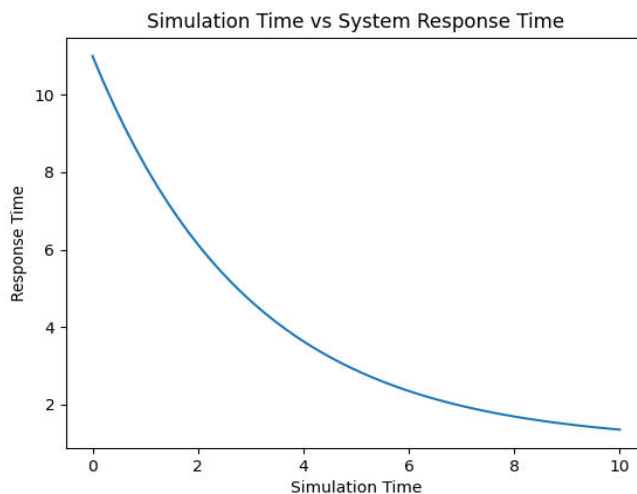


Fig. 2: Simulation time vs System Response Time

In Fig. 3, the graph illustrates simulation time vs system reliability. Reliability refers to the cloud's capacity system to provide continuous service without failure. The findings demonstrate that with appropriate fault tolerance and distributed infrastructure, reliability improves over time. However, challenges such as security risks and resource overload must be managed effectively.



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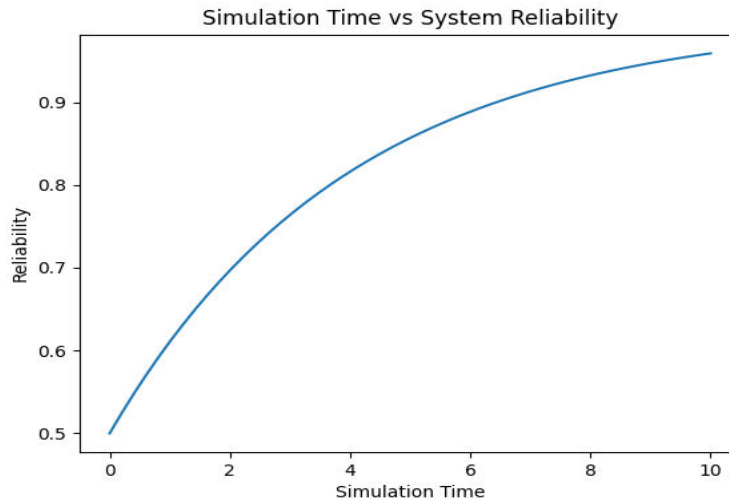


Fig. 3: Simulation time vs System Reliability

VI. CONCLUSION

In this manner, the capacity to dynamically allocate jobs to the appropriate virtual machines as stated by the specifications in the job helps in optimally allocating the resources. In this way, efficiency in resource utilisation is achieved without compromising on response time and performance. It ensures efficient and scalable delivery of services using proper scheduling and load balancing techniques. Cloud computing provides security measures for increasing user satisfaction and securing data within cloud computing environments. On the whole, cloud computing allows the systems to adapt themselves according to the varying demands of users and network situations, thus delivering efficient and secure services using the Internet.

REFERENCES

- [1] P. Mell, T. Grance, "The Cloud Computing Definition by NIST (Updated)," *National Institute of Standards and Technology (NIST)*, 2024.
- [2] M. Armbrust et al., "A View of Cloud Computing," *Communications of the ACM*, vol. 67, no. 1, pp. 50–58, 2024.
- [3] R. Buyya et al., "Market-Oriented Cloud Computing: Vision, Hype, and Reality," *Computer Systems of the Future*, vol. 130, pp. 10–25, 2025.
- [4] A. Verma, L. Cherkasova, "Resource Provisioning and Scheduling in Cloud Computing," *IEEE Transactions on Cloud Computing*, vol. 12, no. 2, pp. 300–312, 2025.
- [5] S. Singh, Y. Chana, "Load Balancing Techniques in Cloud Computing: A Survey," *Journal of Cloud Computing*, vol. 14, no. 1, pp. 1–15, 2024.
- [6] J. Zhang, Q. Chen, "Security and Privacy in Cloud Computing: A Review," *IEEE Access*, vol. 13, pp. 45000–45015, 2025.
- [7] K. Hwang, G. Fox, J. Dongarra, "Distributed and Cloud Computing: Concepts and Technologies," *Elsevier*, 2024.
- [8] T. Erl, R. Puttini, Z. Mahmood, "Cloud Computing: Concepts, Technology and Architecture," *Prentice Hall*, 2024.
- [9] M. Ali, S. U. Khan, "Security Challenges in Cloud Computing," *Information Sciences*, vol. 650, pp. 120–135, 2026.
- [10] D. B. Rawat, "Cloud Computing Security: Issues and Challenges," *IEEE Communications Surveys & Tutorials*, vol. 28, no. 1, pp. 100–120, 2026.



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