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International Journal of Engineering Technology Research & Management
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SERVICE MECHANISM FOR CLOUD PROFIT OPTIMIZATION

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ABSTRACT
In this study, we design a system to help both cloud providers and users optimize their profits.
Game theory, a decision-making approach in which each player (in this case, the cloud provider and users) makes choices that have an impact on one another, is how we approach the issue. We use a Stackelberg game model to simulate the decision-making interaction, where the cloud provider takes the lead and affects the users' response strategies.
The objective of the cloud provider is to choose servers and distribute requests in a way that minimizes energy consumption while still satisfying user demands. Consumers aim to reduce waiting times and increase profits. To find the best strategies for both parties, we develop an algorithm and validate its performance with numerical examples.

Keywords:
Stackelberg game, cloud computing, game theory, resource allocation, and profit optimization.

INTRODUCTION
Although cloud computing offers flexibility, users want high performance at low cost, and providers face energy cost challenges. By facilitating intelligent choices that maximize profits, conserve energy, and guarantee effective services, game theory aids in striking a balance between these objectives.

OBJECTIVES
The objective is to create an intelligent system that enables cloud providers to reduce energy expenses while providing users with quick, reasonably priced services. It models their interaction using game theory to help both parties make better decisions and make more money.

METHODOLOGY
The system is divided into essential modules to maximize cloud profits. Users must first register and submit their service requests, along with their preferred load and timing. The cloud provider then chooses effective servers using a profit-driven approach. In order to improve efficiency and decrease response time, the system allocates user requests to servers in an optimal way. By simulating the provider-user relationship, a Stackelberg Game framework enables both parties to modify their tactics for improved results. Ultimately, these tactics are updated by an iterative algorithm until the greatest amount of profit and utility is realized for all stakeholders.

Figure 1 Home page

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RESULTS AND DISCUSSION

Profit optimization for cloud providers and users is successfully balanced by the suggested Iterative Algorithm (IA). The iterative algorithm rapidly stabilized, reaching a balanced result (generalized Nash equilibrium) in about 80 steps, according to simulation results conducted with up to 50 users over 24 time slots. To save energy, it assigns user requests, chooses server subsets wisely, and shuts down unused servers. IA demonstrated its efficacy and scalability in dynamic cloud environments by achieving higher profits, improved energy efficiency, and maintained service quality when compared to existing methods.

ACKNOWLEDGEMENT

We express our sincere gratitude to the Vidya Jyothi Institute of Technology's Computer Science faculty and staff for their invaluable assistance and direction during the project's development. We would especially like to thank Prathima Mam, our mentor, whose knowledge and wisdom were invaluable in helping us finish this study.
We also want to thank our coworkers and fellow students for their collaboration and insightful criticism, which greatly raised the standard of our work. We are incredibly appreciative of our families' unwavering support and motivation.

CONCLUSION

By using game-theoretic modeling, the project suggests an intelligent cloud framework that aims to boost profitability for both users and providers. It maintains user satisfaction while effectively managing energy and resources. The optimal servers are selected and requests are distributed equitably with the aid of an iterative algorithm. The system has a dashboard for managing users, services, and data, and it is user-friendly and adaptable. According to simulation results, it functions well, conserves energy, and adapts well to changing demands.

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