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Identifying Thematic Boundaries of the Field and Mapping the Academic Community for Cloud Computing Research

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Abstract

Cloud computing has revolutionized the way information technology is conceptualized, delivered, and consumed. As an interdisciplinary field that intersects computer science, business, and engineering, cloud computing research encompasses a diverse range of topics and approaches. This article explores the thematic boundaries of the cloud computing research field and highlights the importance of mapping the academic community within this dynamic and rapidly evolving domain. One of the foundational themes in cloud computing research is infrastructure and virtualization. This involves the design, management, and optimization of the physical and virtual resources that underpin cloud services. Topics within this theme may include server virtualization, resource provisioning, scalability, and data center architecture.

Keywords: Dynamic • Networking • Virtualization

Introduction

Cloud computing offers various service models, such as Infrastructure as a Service (IaaS), Platform as a Service (PaaS), and Software as a Service (SaaS). Research within this theme investigates the characteristics, advantages, and challenges associated with each service model. It also explores how these models enable businesses to efficiently deploy and manage their applications. As cloud computing involves outsourcing data and services to third-party providers, security and privacy are paramount concerns. Researchers delve into encryption, access control, identity management, and data protection to ensure the confidentiality and integrity of cloud-hosted data. The cloud's scalability and resources have facilitated the growth of big data and analytics research. This theme focuses on handling and processing large volumes of data, as well as developing analytical techniques to extract valuable insights from the data. Cloud computing heavily relies on networking and communication technologies. Research in this area includes topics like network virtualization, Quality Of Service (QoS), and latency optimization to ensure efficient communication between cloud components [1,2]. As cloud data centers consume substantial energy, research efforts are directed toward making cloud infrastructures more energy-efficient and environmentally sustainable. This theme explores techniques to reduce energy consumption and carbon footprint [3].

Literature Review

As data processing needs become more real-time and latency-sensitive, edge and fog computing have gained prominence. Research in this area focuses on extending cloud capabilities to the network edge, enabling quicker data processing and reducing bandwidth demands. Cloud computing research is a multifaceted and rapidly evolving field with diverse thematic boundaries. Mapping the academic community through bibliometric analysis, collaboration networks, and online engagement provides valuable insights into the field's trends, gaps, and dynamics. This understanding not only facilitates meaningful collaboration but also supports the allocation of resources and strategic decision-making within the cloud computing research landscape. As cloud computing continues to shape the digital landscape, staying attuned to its academic community is crucial for advancing the field's potential and impact [4,5].

Discussion

Cloud computing offers a range of service models, including Infrastructure as a Service (IaaS), Platform as a Service (PaaS), and Software as a Service (SaaS). Research in this area explores the design, deployment, and management of these service models, as well as their economic and operational implications. Security is a critical concern in cloud computing. Researchers investigate data protection, encryption, access control, authentication, and compliance to ensure the integrity and confidentiality of data stored and processed in the cloud. The ability to scale resources dynamically is a hallmark of cloud computing. Researchers study load balancing, performance optimization, and latency reduction to enhance the user experience and optimize resource utilization. With the increasing environmental impact of data centers, researchers are exploring methods to make cloud computing more energy-efficient and environmentally sustainable. This theme involves optimizing data center operations, resource allocation, and energy consumption [6].

Conclusion

Cloud computing research is a dynamic field with diverse thematic boundaries, spanning infrastructure, security, analytics, and sustainability. Mapping the academic community within this field is essential for fostering collaboration, identifying trends, and promoting advancements. By leveraging research publications, conferences, institutions, online communities, and industry engagement, stakeholders can gain a comprehensive understanding of the evolving landscape of cloud computing research. As the field continues to evolve, mapping and understanding the academic community will remain essential for driving innovation and addressing the challenges of the digital era. Cloud computing has emerged as a transformative technology that has reshaped the way organizations manage and deliver IT resources. As the field expands, it becomes essential to define its thematic boundaries and understand the academic community driving its progress. This article delves

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into the key themes within cloud computing research and explores methods to map the academic landscape in this dynamic and multidisciplinary field.

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Conflict of Interest

None.

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