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Challenges and Technological Advances in High-Density Data Center Infrastructure and Environmental Matching for Cloud Computing

Suraj Patel
Automotive IT Infrastructure, Detroit, USA
surajbpatel88@gmail.com

Abstract: *With the increasing demand for cloud computing services, the development of high-density data center infrastructure has become critical. As data centers grow in complexity and density, ensuring that they are well-matched with the environmental and operational needs becomes essential for efficient performance. This paper explores the challenges and technological advances in building high-density data centers to support cloud computing infrastructures. It also focuses on environmental matching technology to optimize cooling, energy consumption, and server performance. Through an analysis of current practices and innovative solutions, the paper aims to provide a comprehensive review of strategies that can address the emerging needs of modern cloud-based data centers.This paper has provided a comprehensive review of the infrastructure challenges and environmental matching technologies critical to the operation of high-density data centers in cloud computing environments.*

Keywords: High-Density Data Center Infrastructure, Environmental Matching, Cloud Computing

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