Chapter 10
Integrated 5G and Edge Computing Framework for Low-Latency IoT Applications

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ABSTRACT

The main idea of cloud computing is being widely promoted as the solution to current ongoing IT problems. In recent years the approach towards IT investment and management is constantly changing. At the same time, cloud computing has developed as a foundation of the contemporary technologies which enables the users to receive the necessary amount of such resources and services without any delays.

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The research paper delves into the transformative landscape of 5G networks, focusing on the fusion of edge and cloud computing. This fusion represents a paradigm shift in network architecture, promising enhanced performance, scalability, and innovation. Edge computing, characterized by real-time processing and low-latency applications, complements cloud computing's scalable resources for data storage and processing. Despite these challenges, the fusion of edge and cloud computing enables improved performance, scalability, and innovation, driving digital transformation and competitive advantage in the digital economy.

INTRODUCTION

Edge computing is a special paradigm of a distributed pattern of computing which brings the sources and storages of data into very close proximity. The bandwidth saving and time management is to be improved by designing this model (Sriram & 2022, Cao et al., 2020, Qi & 2019). It follows a special direction of architecture while storing the data. This is also following up a specific hierarchical pattern while maintaining the documents and also the sensitive distribution pattern of computing is supervened (Lin, 2019). An example of edge computing is IoT technology (the internet of things). Some special features of the technology are speed and scalability, privacy and security policy and thus reliability and high efficiency (Qi, 2019). Cloud computing is the automated storage of data in the system (cloud storage) without the active involvement of the user. Cloud computing is based on coherent source sharing while using pay-and-go themes but it may lead to raising unnecessary expenses for the common users.

LITERATURE REVIEW

1. Communicating While Computing

In this context of the article, the author proposed a 5G centric necessity because of empowering the "energy-hungry" terminals for the mobiles while the cloud functioning is also manifested via radio access by using small cell-based power stations (Ali, 2021). Using a cross-layer approach, optimal resource allocation is done along with the radio and computation resources allocation (Ke, 2020). The complete system impacts different parts such as signalling, networking and radio interfacing etc (Hassan, 2019). Firstly, pervasive offloading of the computation, both the up and downlink changes significantly according to the demand of the current situation. The proposed approach for cloud distribution needs intensive modification