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Activity Result Report:

“Development of location based portable 5G enabled IoT EDGE devices to measure, monitor and manage environmental sensor data”

Environmental monitoring systems have become increasingly popular among everyday people and scientists to focus on the abnormal global environmental changes that lead to global warming and influence human living geographies. In recent times, the rapid advancement of wireless networks and widespread use of wireless sensors have increased, eventually leading to the mass production and affordability of diverse sensor technologies. With these advancements, monitoring air quality, weather conditions, and pollution levels has become more accessible for everyone. A wide range of sensors is now available, ranging from basic models to sophisticated ones capable of measuring specific pollutants or environmental parameters. Therefore, these systems have witnessed widespread adoption among both individuals and researchers. In this study, we proposed a system for environmental monitoring that allows users to visualize the data from anywhere over the internet. It also permits users to use the optimal display to customize the historical and real-time data metrics insights in a detailed view to accommodate their precise preferences and requirements. As a result, an environmental monitoring system is developed that can efficiently visualize and analyze large amounts of diverse sensors data, accessible to users.’ This paper presents an IoT system designed to seamlessly integrate IoT into edge-to-cloud systems, prioritizing enhanced system security, responsiveness, meticulous data management, and IoT connectivity. The characteristics of the proposed system integrate Hardware, Network, and Software configurations to easily perform environmental monitoring on a web app through the internet without being restricted by time or location.

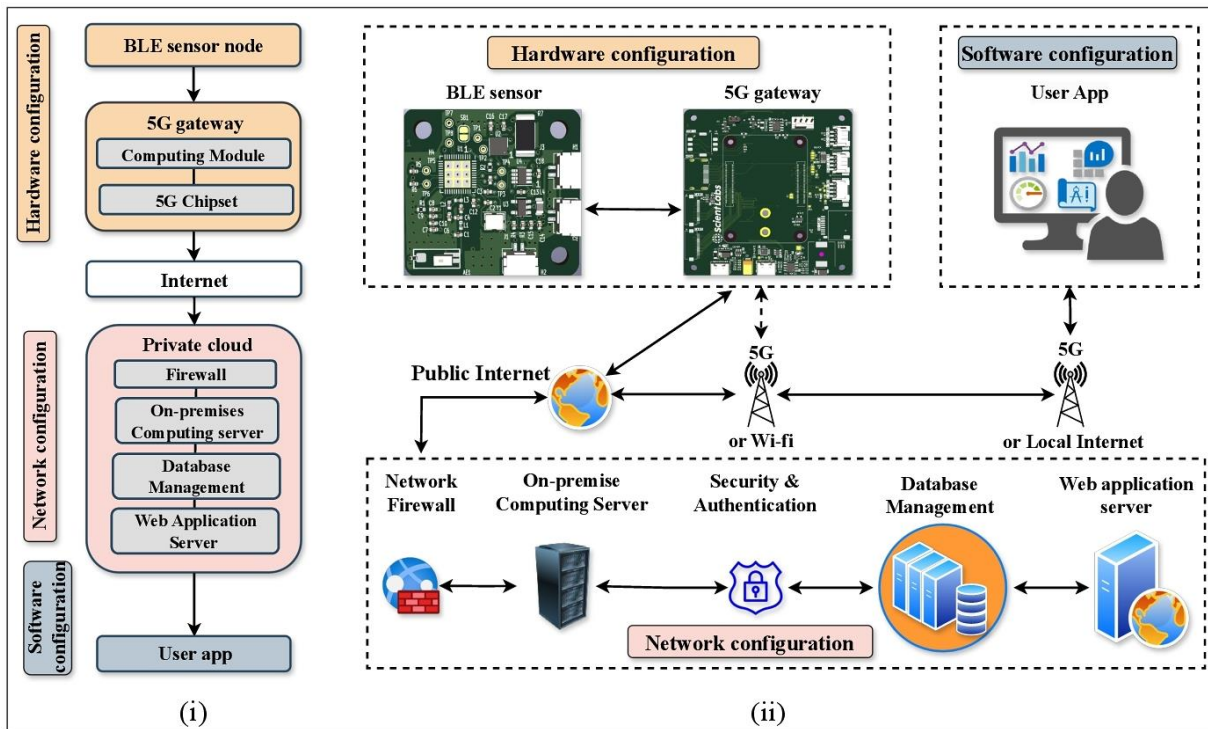


Fig. 1 (i) illustrates the schematic representation and Fig. 1 (ii) Architecture blocks of the proposed 5G-enabled edge environmental monitoring system

By developing a flexible environmental monitoring system, we were able to make environmental monitoring more accessible. Even individuals without measuring equipment can engage in various environmental monitoring activities using the data collected. The system facilitates communication and collaborative information exchange among multiple users with the potential for new discoveries. The benefits of using the system are substantial, as users can operate environmental monitoring with customized settings via the web. Previously, displaying sensor data on the web required custom HTML files tailored to each user. However, with the ability for users to select necessary sensing and automatically generate data, the user burden is significantly reduced. Additionally, customized display contents allow users to monitor the environment data using interfaces tailored to their preferences.

Problems/Constraints:

Components procurement lead time-high, PCB assembly quality (low cost-low) and Server setup and firewall-configuration lead time (low cost-medium).

Research Output:

Location based portable 5G enabled Internet of Things IoT EDGE device to measure, monitor and manage environment sensor data- Accepted, CNIOT '24: Proceedings of the 2024 5th International Conference on Computing, Networks and Internet of Things · Pages 436 – 442
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