

Distributed Database Semantic Integration of Wireless Sensor Network to Access the Environmental Monitoring System

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Abstract

A wireless sensor network (WSN) works continuously to gather information from sensors that generate large volumes of data to be handled and processed by applications. Current efforts in sensor networks focus more on networking and development services for a variety of applications and less on processing and integrating data from heterogeneous sensors. There is an increased need for information to become shareable across different sensors, database platforms, and applications that are not easily implemented in traditional database systems. To solve the issue of these large amounts of data from different servers and database platforms (including sensor data), a semantic sensor web service platform is needed to enable a machine to extract meaningful information from the sensor's raw data. This additionally helps to minimize and simplify data processing and to deduce new information from existing data. This paper implements a semantic web data platform (SWDP) to manage the distribution of data sensors based on the semantic database system. SWDP uses sensors for temperature, humidity, carbon monoxide, carbon dioxide, luminosity, and noise. The system uses the Sesame semantic web database for data processing and a WSN to distribute, minimize, and simplify information processing. The sensor nodes are distributed in different places to collect sensor data. The SWDP generates context information in the form of a resource description framework. The experiment results demonstrate that the SWDP is more efficient than the traditional database system in terms of memory usage and processing time.

Keywords: environment monitoring, semantic database, distributed data, wireless sensor network, semantic web

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