

The Cloud-Based Sensor Data Warehouse

As advances in technology, sensors have been widely applied to various different fields. Sensor data with time characteristic, therefore after a long period of observation that demand for data storage and analysis are very large. The relational database is the most widely used database architecture that through the normalization process to design the table structure. The tables related to each other through the foreign key fields for data link. The greatest benefit of relational database is easy to manage data. The data after normalization can be avoided through the problem of inconsistent data. But the drawback is that data is stored using row-oriented which all rows in a table are the same. When the data is increasing exponentially such as the need to change table structure it takes more time to consume to restructure data. And, the traditional relation database often faces with the need to expand storage space problem. The most often way to solve this problem is to extend the storage space vertically, however, all data stored on a single server will cause a larger workload on the server. The cloud computing is considered to solve the large-scale of data analysis and storage problem. One of the characteristics of the cloud computing is high extendibility, flexibility and high fault tolerance. The cloud computing is used in distributed architecture which the data stored in distributed nodes in cloud and it can effectively improve the problem of overloading on a single server. This paper proposed a method for storing large-scale sensor data which using cloud-based distributed database - HBase. HBase is the Open Source version of the Google BigTable that is different from the row-oriented relational database. HBase used column-oriented paradigm that have highly flexible and more able to meet the needs of a variety of sensor formats. In this paper, we analyzed the data writing and reading performance based on large scale sensor data. The experiment proved that using HBase on large-scale sensor data with very good performance.

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