UPS battery remote monitoring system in cloud computing

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Abstract. This paper introduced the structure and operational status of UPS Battery Remote Monitoring System, analyzed UPS battery monitoring data and UPS battery computational features. In allusion to the UPS battery remote monitoring system of long-term monitoring to the huge amounts of data, putting forward the application of cloud computing technology to satisfy huge amounts of UPS battery data access to reliable and high-performance computing, realizing Stability, extensibility and the diversification of applications of UPS battery remote monitoring system. Through the comparative analysis of cloud computing technology selection, putting forward the UPS battery remote monitoring system based on cloud computing architecture, in the end, the preliminary design scheme was presented.

Keywords: Cloud computing, UPS battery monitoring data, High performance computing, Reliable access

1 Introduction

As an important energy storage unit of UPS, battery performance and quality directly affect the safety and stable operation of machine room equipment. Today, as the scale of the enterprise to further expand, production area is more and more widely, the number of UPS increased, the dispersion problems of UPS should be solved as soon as possible. At the same time, the practicability and importance of UPS battery remote monitoring system is increasingly prominent. UPS battery monitoring data and its analysis computation showed the geometric level growth. The user puts forward high demand for remote monitoring system of UPS battery, puts forward more and more high requirements for reliable access to mass data, high performance computing, the stability and scalability of application system and the diversification of application mode.

In this paper, using cloud computing technology [1-3], building the new UPS battery remote monitoring system: Through the cloud data storage [4] to solve the problem of reliable access to huge amounts of data [5]; Through analyzing cloud computing to solve the problem of high performance computing; Through cloud Business applications to solve the problem of stability and scalability of the
application system; Through cloud terminal [6] to achieve the diversification of application mode.

2 The overall architecture design

The cloud computing technology based on massive UPS battery monitoring data as far as possible according to open source software technology. Through the research, Hadoop will be used as the basis for realization. Hadoop have the two parts distributed File system (HDFS) and distributed computing MapReduce. HDFS is a master/slave structure. MapReduce is a programming model, which is used to calculate the large amount of data. Based on Hadoop, you can write distributed parallel programs of huge amounts of data can be processed and runs on a large-scale computer clusters composed of hundreds or thousands of nodes.

This article refers to cloud computing architecture, combined with the actual needs of UPS battery remote monitoring, taking the cloud computing technology into the UPS battery remote monitoring platform, we designed a UPS Battery Remote Monitoring System based on Cloud Computing. Its architecture shown in Figure 1.

![Fig.1. The architecture of UPS battery remote monitoring system in cloud computing](image)

3 Cloud data storage layer

UPS Battery Remote Monitoring System Stored data not only include real-time monitoring data, also including the equipment running status data. UPS battery status the raw data belong to unsustainable data, so ensure reliable access of huge amounts of UPS battery status data have important significance in UPS battery research.

Cloud data storage of UPS Battery Remote Monitoring System can be used Hadoop technical architecture to expand, Using HBase as the massive data management system, Hadoop HDFS as a distributed storage system, Xen as a virtual machine. The data is split by Hadoop HDFS, divided into multiple data block, stored
on different storage nodes. Cluster consists of a master server and a certain number of
data servers: Master server is responsible for managing file system namespace and
customer access to the file, data server is responsible for managing storage of the
node.

Building a master server in UPS battery monitoring laboratory of the head office
center, and can be equipped with a standby master server, Other branch database
server as data server, Thus building a unified database has good fault tolerant
performance of UPS battery.

4 Analysis and calculation of cloud layer

The Analysis and calculation of massive UPS battery monitoring data mainly to
complete real-time data processing, multiple dimensions of time and space on
statistics and data mining, etc. Existing analysis and calculation of massive UPS
battery monitoring data are carried out in their respective central station, the
efficiency is very low.

Using analysis and calculation of cloud, collection analysis and calculation
server’s performance of each branch to analyze and calculate data, greatly improved
the performance of the system. In the selection of Hadoop technology to realize data
storage on the basis of the clouds, Hadoop technology roadmap’s MapReduce can be
used as parallel programming model. MapReduce-based data parallel processing
system can provide high performance parallel computing ability and general parallel
algorithm development environment for forecasts and real-time processing and multi-
dimensional space-time analysis of massive data calculation of sudden huge amounts
of data, mainly consists of algorithm calls and task management.

5 Cloud business application layer

Adoption of cloud business applications, it will integrate central station server
resources of each system. In the process of implementation, using a service-based
architecture, UPS battery applications are separated into application service layer and
application layer, application service layer provides business data application services,
application layer can be displayed in various ways, such as Web browser, PC
applications and mobile applications, as shown in figure 2.
6 Conclusions

In this paper, using the latest cloud computing technology, on the basis of existing systems, proposed UPS Battery Remote Monitoring System in Cloud Computing. Follow-up work will use Hadoop technology roadmap to establish a UPS battery remote monitoring platform prototype system, realizing the business layer of stratification and development of diversified lightweight terminal system, experimental test on the prototype system, from testing and comparing the performance and scalability to verify the validity of the proposed method.

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