

# Research on Distributed Database Management of Wireless Network Sensors Based on Cloud Computing

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## Abstract

With the development of The Times, the total amount of network information data shows exponential growth, and the demand for specific data is also more, the traditional cloud computing needs to constantly establish more corresponding communication system. The core cloud computing based on IP technology has been continuously developed and gradually become a more formed distributed database development technology at present. In the Internet, people can access the virtualization resources they need and easily extend through cloud computing technology. The technology is used in a number of fields, but all of them have one thing in common: they produce products or goods that need to be distributed via the Internet. For this reason, cloud computing can be seen as a figurative metaphor for the Internet. By analyzing the application layer development of cloud computing technology, this paper discusses the development of distributed database based on computer cloud computing technology for readers' reference.

**Keywords:** Computer, Cloud Computing Technology, Network Application, Software Development;

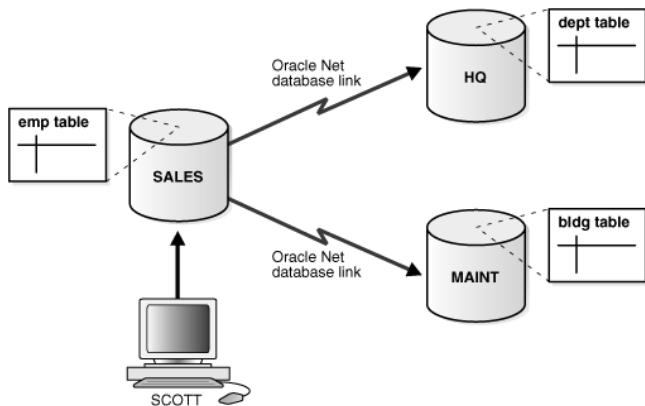
## 1. Introduction

Based on computer cloud computing technology, this paper selects software such as Load Runner 10.0 as the research tool, simulates the network software application of 60 users through four computers at the same time, and tests its relevant running state. Studies have found that the majority of users can normal login, using the system operation, the complete set of business processes, but at the same time, this study also continue to explore complex business operation in the process of software development problems, on the basis of monophyletic Overlay the development road of processing nodes to join, the goal is to blend computer cloud computing technology, promote the further development and application of the distributed database<sup>[1]</sup>.

### 2.1. System test of distributed database

The development of application layer is built under the background of numerous users and full load operation of the system. The system test of distributed database should take the stability of system operation, the uploading and saving state of data and the feedback of user operation as the primary test objectives<sup>[2, 3]</sup>. These tests can provide a comprehensive and comprehensive evaluation of the system performance, as well as feedback on the core performance of the distributed database. In the research of this paper, software such as Load Runner 10.0 is selected as the research tool, and the network software application of 60 users is simulated by four computers at the same time, so as to realize the accurate judgment of system performance (as shown in Figure 1 below).

## 2. Overview of application layer development based on cloud computing technology



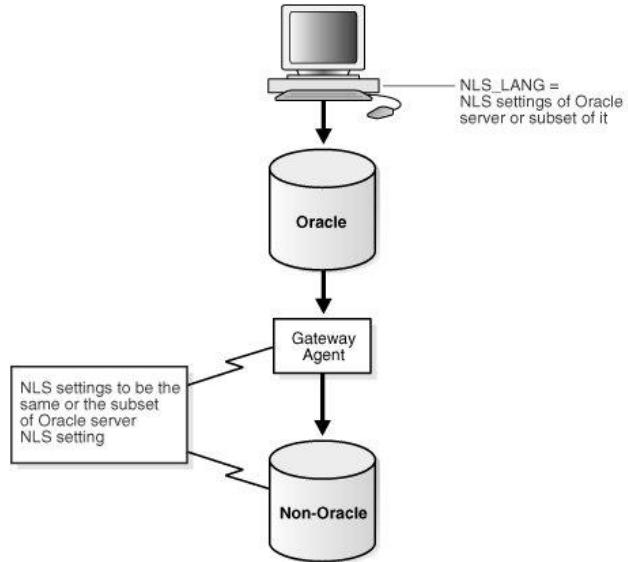
**Figure 1.**The overall architecture of a distributed database.

The discovery mechanism based on DHT provides a sustainable development platform for application layer development. Among them, Overlay development also transfers the corresponding development function from the router to the mobile end, records the functional network overlaid on the IP network, and generates the corresponding node record topology structure and generates the corresponding information distribution tree according to the corresponding information in the Overlay network.

## 2.2. Improvement of the pastry routing algorithm on the internet

The Pastry algorithm is an extensible distributed routing algorithm proposed by Microsoft. Its feature is that it can effectively build a large-scale self-organizing P2P system, and any host connected to the Internet can integrate into the corresponding P2P network by running the algorithm. As shown in Figure 2 below, the IP development in the network cannot be short of the update and application of Free Pastry system. In the Linux system application, the new IPv6 development address is indicated by the prefix FF::/8, which includes the widely used development address structure, link management system, development routing protocol and so on. Pastry algorithm, namely double stack technique through fusion, MTAP6 is made up by multiple network and access network road, overlapping part adopts TCP/IP application layer management<sup>[4]</sup>, development and management of access part adopts IPv6 and build based on overlapping IPv6 IP technology development system, making it more

efficient, and in accordance with the J2EE technology based on a standard system system structure with the characteristics of good stability and strong processing capacity, construct has more excellent ability in developing new Node ID standard operation, to realize the stable operation of the operating system.



**Figure 2.**Algorithm improvement design for a distributed database.

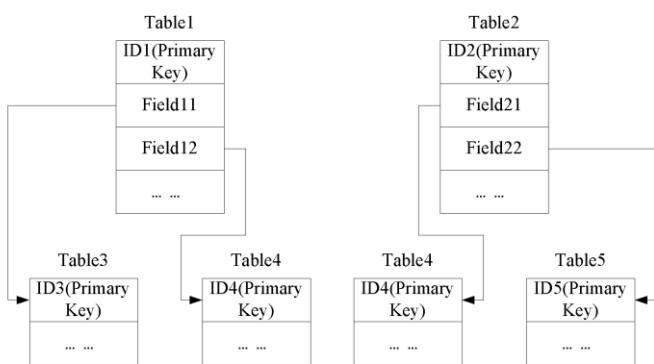
Routing improvement of the Pastry algorithm needs to be based on IPv6 and integrate distributed hash table technology. Starting from the practical application environment of IPv6, the harshness of the application environment should be continuously improved. From IPv4 to IPv6 is a long process, in which dual stack technology and tunnel technology should be used. The functions of IPv4 and IPv6 are relatively similar, and the network layer protocol can be shared. The GOSSIP protocol based on computer data analysis can solve more difficult problems in wan development and application. At the same time, the network structure can also be used to save the corresponding data bitmap in the overlay network structure, which can make the process of selecting the corresponding data in cloud computing more rapid<sup>[5]</sup>. Different data encoding in the node affects whether it is affected with similar nodes. The network structure screens out the network system where the required information is located from the comprehensive data network, and constructs the information selection mode of multiple simultaneous similar nodes to form the corresponding data

transmission channel and support IPv6 node communication. The new Pastry algorithm USES Java language, the test program USES FreePastry2.0 standard, and realizes the identification of the Epoch Inert Socket Address through the analysis of the standard route.

### **3. Design of MTAP6 based on cloud computing technology**

#### *3.1. Cloud computing development of distributed database*

The WAN development software designed in this paper is based on Overlay development, combined with cloud computing, IP technology and other applications. The design of MTAP6 is the key part of it. It should be able to adapt to the heterogeneous type of Internet network and adjust the dynamically changing network node environment. MTAP6 design platform for Java development, in general, the platform system in the actual business of processing the data and transaction process is divided into four parts<sup>[6]</sup>, namely, the demand of information, information obtaining supervision and the results of calibration, measurement data upload and connect to a database update, make its export work overall pattern, the following structure is shown in figure 3:



**Figure 3.** Cloud computing applications based on multi-chart design.

In the traditional business process, the information in the database is mainly derived from a single external measurement and Overlay development format data generated based on this, the development process and input methods lack of standardization, greatly increase the difficulty of storage and reduce the efficiency of business

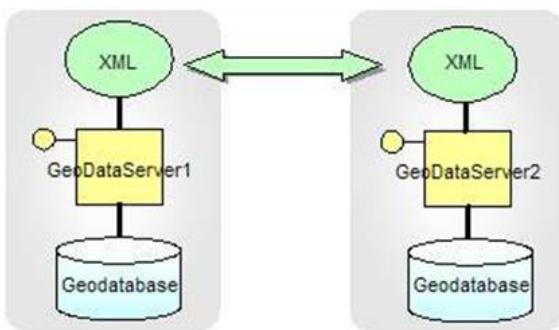
processing, even in the process of transformation format MTAP6 produces a large number of operational problems, for example, the cohesion of the symbols, line surface processing, significant impact on the effectiveness and accuracy of information in the database.

#### *3.2. P2P transmission mode of distributed database*

From the perspective of the transmission of control information, it can be found that the system control of MTAP6 still adopts the TRANSMISSION mode of P2P and lacks the corresponding upper-layer monitoring of the client. Communicate the Message content provided by Pastry algorithm of encapsulation, through P2P routing assignment and send up corresponding processing data submitted to the server, will be the necessary information by screening of Pastry algorithm at the same time, in the process of system design and build, design personnel should establish good fault tolerance error correction mechanism, guarantee system in the normal use of a variety of environmental background. In addition, on the basis of computer cloud computing technology of distributed database development and daily management should use efficient database management technology, ensure that under the condition of high load using the data of reliability, and can realize distributed database data backup in an emergency, and in the case of provide functional module illustration overall reflection, from the viewpoint of system security in the form of a Message is sent to the corresponding to different nodes of P2P network.

#### *3.3. Combining IPV6 technology and network application development*

From the perspective of QOS support, ERIC technology has an important impact on the research of IPv6 application in the network by identifying the corresponding data through specific target IP address, and it also improves the computing speed and reduces the storage waste, as shown in the figure below:



**Figure 4.** Distributed database management and network development system.

In the structural flow shown in Figure 4, the IPv6 development program enables its underlying operating system to provide more standard application programming and access further available network services through programming interfaces. Among them is BSD technology, which can be used flexibly in different operating systems, and through the test of Socket API, it can be found that it is suitable for a variety of network protocols, among which there is IPv6 system protocol. But protocol programming for such developers requires additional extensions to support it. The IETF further standardized two types of extensions, from basic Socket API to advanced corresponding programming development, suitable for a wide range of IPv6 development programs, based on which a wide variety of basic information can be realized. In addition, the development program of IPv6 defines the original socket function corresponding to IPv6, and USES different development technologies to realize the technical development of IPv6.

#### 4. Application software demonstration based on computer cloud computing technology

From the perspective of video system, the video system is mainly composed of four aspects, including capture's acquisition of program data stream, super use of video server, configuration update of system components, and application of capture server. By the capture program data stream to get in the first place, and on the basis of CP - SP agreement for programmer registration, use the tracker to extract the program summary, landing the client in a timely manner and validation, and through the video server

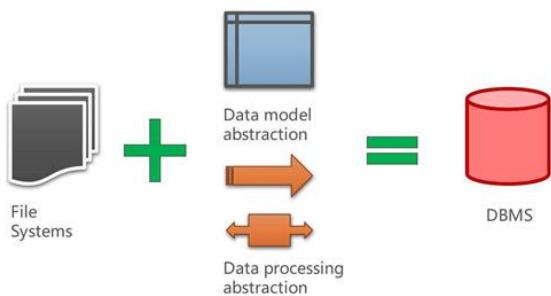
registration and information submitted to lock the target, further after the client login from video server to download the video data, and provide remote play.

As an important component of the server side, video server is the data source of wide area network development. Combined with IP technology, it can timely and effectively receive capture video data, receive connection requests from client nodes and send corresponding data to the client side at the same time. Super plays a very obvious role in this aspect. The use of system components cannot be separated from the configuration of the video server. After acquiring tracker, the server can be registered, and the protocol interaction can be carried out by using UDP protocol. The data of TCP class can be inherited and the uploaded data of capture server can be received at the same time. In the Linux system application of video server, MTAP6 is a combination of multiple networking and access networks. The overlapping part adopts IP application layer management, while the access part adopts IPv6 development management, so as to build an ipv6-based IP technology development overlapping system, so that it can be applied more efficiently.

#### 5. Wireless network sensor database management based on cloud computing

##### 5.1. Generation of cloud computing

With the advent of the information age, cloud computing continues to develop along with the information revolution. The epitome of the discovery of the information age can be seen in the evolution of information computing devices, from mainframe computers in the 1960s, to minicomputers in the 1970s, to private computers in the 1990s, and now to the Internet age affecting people everywhere. The constant updating of equipment means that the technology is constantly changing and the speed of communication network is constantly accelerating. As the foundation of cloud computing technology, it means that the development of cloud computing technology is going on all the time.



**Figure 5.** A cloud-based study of distributed database management.

For software engineering design concepts at the same time, also as the development of technology, great changes have taken place, in the 1970 s, as a result of the limitation of technology, people in the design of software engineering, is limited by process scheme design, with the development of technology, the software design change gradually, slowly by the original software oriented machine into software as a service, and this shows that the development of cloud computing technology with more human oriented, provide a more humanized service for people.

The continuous development of science and technology and innovation, has brought the huge impact to people's life, people interact with machines have changed slowly, people first to interact with the computer via the keyboard symbols, developing to now touch, voice, gestures and other man-machine interactive mode, and multimodal interaction design core are around the user experience, software designers will focus on the user's demand to design.

### 5.2. Main technologies of cloud computing

#### 5.2.1. Cloud platform technology in cloud computing

As one of the core components of cloud computing technology, cloud platform technology builds a complete architecture of the data built by it. The characteristic of this architecture is to provide users with the most convenient operation and service, and users do not need to know the specific details of the operation of the cloud space, they only need to complete the corresponding operation in the platform by themselves. At the same time, users can make adjustments according to their own requirements. The key of this technology is virtualization

technology, which not only provides services on demand, but also maximizes the cost of running the cloud platform. In addition, cloud platform can meet the computing needs of all users at the same time; thanks to the cloud platform technology is based on large-scale data centers, providing them with the highest computing services.

#### 5.2.2. Cloud computing virtualization technology

As one of the key components of cloud computing technology, virtualization technology can effectively integrate and utilize virtualized resources in the Internet according to users' own needs.

The use of virtualization technology can make full use of existing resources. The application of virtualization technology in cloud computing is mainly reflected in the following aspects: server virtualization, application virtualization, storage virtualization, platform virtualization and desktop virtualization. Server virtualization refers to the virtual use of the actual existing servers into multiple servers; Storage virtualization means that the existing cloud system resources are efficiently integrated, and unified and standardized management is implemented, so as to create a unified storage space for users. The application of virtualization makes the original software no longer overly dependent on the underlying system, and the requirements for hardware standards are also reduced, thus reducing the user's operating threshold. In addition, the application of virtualization technology also effectively avoids the conflicts among the application software. Platform virtualization provides a convenient software design platform for software developers, which is oriented to the entire software developers. The designed application software is available for all users at the same time. Desktop virtualization enables users to decouple the user's desktop environment from the user's terminal devices by displaying the complete desktop environment on the processing server.

#### 5.2.3. The implementation form of cloud service

Cloud services rely on Web services, therefore, cloud services can effectively rely on Web services to build a sound service architecture, effective organization

and collaborative management. In recent years, with the SOA architecture is put forward and the development of cloud services and the corresponding change, IT can effectively deployed on the platform, the realization of the function of IT, means that the future users can obtain effective and timely service, or a very short time delay after get reply, for this reason, cloud services for the future development of the core will be around in the design of the user experience of the individuals and institutions, at the same time also will meet the design of other IT related functions.

### 5.3. Cloud security issues

The birth of cloud computing technology has effectively integrated the huge virtualized resources in the Internet and provided professional and standardized services for users. Cloud computing technology, on another level, is also an important guarantee for Internet security. When cloud computing technology is used as a security service, people can carry out cloud backup of the system, transforming the original patches, antivirus and other security issues into cloud backup security management and trust management.

## 6. Conclusion

Starting from the development of IPv6 and IP multi-development technology, this paper analyzes the Free Pastry routing algorithm in the cloud computing technology, and further explores the application scope of the Pastry system algorithm to build an ipV6-based IP technology development overlapping system, so that it can be applied more efficiently. At the same time, the data in IPv6 was adjusted by modifying the operation function in the Epochal Inept Socket Address, and meanwhile, the corresponding network TCP protocol of Free Pastry was established to maintain the original communication. Starting from the practical application environment of IPv6, the application environment universality was continuously improved to promote the construction of the next generation IPv6 network system.

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