The Analysis of Grid Database Technology in the Computer Application System

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Abstract. Through the introduction and analysis of the concept of the grid, grid database technology, discuss the status of the grid database technology, the content and direction of the research, and discuss problems that the technology faces in computer applications.

Keywords: grid, grid database technology, applications.

1 Introduction

A lot of convenience is brought to people's lives and learning with the internet advent. However, the various servers become Resource Island due to the lack of effective contact among them, and lead to a lot of useful information resources which is archived by storage devices can not be effectively sharing and exchange. Grid is a new network computing platform following the World Wide Web, and its purpose is to provide users with a infrastructure that people can comprehensive share resources. Data as an important Grid resource occupies an important position in the grid computing, and how conveniently access to the grid data is to become an important topic in grid research field. By far, with grid technology development it varies from the original computational grid to today's storage grid, data grid, information grid, etc. and the grid database technology is produced through combination of grid technology and database.

2 Introduction of Grid Database Technology

Grid use of the Internet, all kinds of resources which are widely distributed geographically,

For example computing resources, storage resources , software resources and data resources together as a logical whole make up a virtual supercomputer, provide users with integrated information application services, in order to share Internet resource comprehensive. Therefore the sharing of resources is the essential characteristics of the grid. The core problem that is resource sharing and collaborative working in a dynamic virtual organization is going to be addressed.

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2.1 Grid Architecture

The grid architecture that is the basis for building a grid system is a framework which constructs grid. It defines the sharing relationship about the negotiation, establishment, management, use between users and resources the basic mechanisms. Five levels hourglass structure and open grid services architecture are generally admitted, five levels hourglass structure is introduced in this paper.

Five levels hourglass structure treat the "agreement" as hourglass architecture's heart, and stress the position of agreement in the grid resource sharing and interoperability. The simple structure and clear hierarchy are its main features, and it focuses on the qualitative description rather than a specific protocol definition and is helpful to the overall understanding of the computational grid. Another important feature of five levels hourglass is hourglass shape. Due to the different number of each part of the agreement, the short supply number of the core protocol, So the core protocol form a bottleneck in the protocol hierarchy and the resource layer and link layer together form a bottleneck part of the core. It is similar to the traditional TCP / IP network protocol and various components are distributed in five different levels according to the functions, shown in Figure 1. From the outside to inside: application layer, convergence layer and resource layer, link layer, structural layer.

The basic functions of the grid structural layer is control of local resources and to provide an interface to access these resources; the basic function of the link layer is to achieve mutual communication, and It defines the core communication and authentication protocols as network transaction processing for the grid; the resource layer function is to achieve the sharing of individual resources; protocols and services (including the API / SDK) describes the commonalities of the resources, and it does not involve the specific characteristics of resources; the application layer exists in the virtual organization environment, and is constructed according to the services defined in any one level.

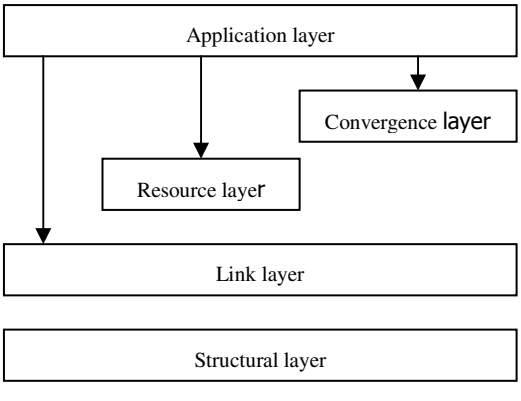

Fig. 1. The hierarchical graph of five-story hourglass structure

The Open Grid Services Architecture (OGSA) is the most important grid architecture following the five-story hourglass structure, and it is a kind of structure whose core is service, and is called the next generation of grid structure.

2.2 The Status of the Grid Database Technology

The grid database gridded the existing database. The purpose is to achieve efficient data management functions and provide support for wide area data resource sharing. It is based on Open Grid Services Architecture Institute which provides mesh database service. Let Grid users or grid service via a mesh database service access to variety of heterogeneous databases of grid.

In the field of grid database technology research, the research scope and scale of the U.S. and Europe is relatively large, in a leading position. On the basis of facing computing grid Initially to study and realize the function of data management the Globus system has become the most famous grid data management system development platform.

China has also done a lot of research work to promote the application of the data grid. A solution is proposed for multiple applications encountered problem of mass data storage, management, processing and joint services.

3 In-Depth Study of Grid Database

3.1 The Content of Grid Database Technology Research

Grid Database research mainly includes three aspects of grid database management systems, grid database integration and support for the new grid.

The grid database management system is an important resource of the grid. Two steps can be divided to build the grid database management system: the first step is to provide a middleware so database management system packaged as a grid service to grid access to the grid database; the second is expansion of existing database management system, and it is directly provided by the grid to achieve a distributed database and grid services.

The grid database integration is to use the information in two or more grid database, and use this information to build a large database. The virtual database is a federal database and it is only a federal model, and all users are unable to perceive the fact of the existence of multiple independent databases. The virtual database is an ideal target too much attention to detail and custom integration, incremental integration of living between the two. Incremental integration, developers need to complete every detail of the integrated and advanced data access and integration of components can be automatically completed some post- integration steps in support of the new grid data stream processing , information retrieval and scientific data analysis grid.

3.2 The Development of Grid Database

Now with grid technology increasingly widely used in the database grid database will be a rapid and steady development. Comprehensive analysis of research in the grid database at home and abroad, the trends of grid database development in the following areas:

1. Focus on database access and integration standards. Although the issues involved in grid database integration is not fully resolved, currently existing grid database access and the integrated draft standard and this draft is available to let the actual software system achieve the goal.
2. More research on grid database management system. The access and integration of grid database using the method of middleware, expect future database will support the grid more directly.
3. Continue to explore the grid the new demands. Scientific research in the grid have a lot of problems about data management to be solved, Some of these problems can not be solved just simply the data to mount the database and they are able to promote the development of database technology.
4. The new database technology will be carried out under grid environment. If you put these studies into the grid environment , you will receive an unexpected effect.

3.3 The Problems of Grid Database Faced By

In the process of the development of grid database advancing forward, the following question is worth to discuss.

3.3.1 Focus on the Safety of the Grid Database

The grid database implementation on data resources which are distributed, heterogeneous, autonomous, mass and other characteristics in the grid a unified access and integration, variety of data resources sharing and collaboration within the scope of the WAN on the Internet. These will bring the security issues of data sharing. Therefore pay particular attention to issues of data storage and user authentication in process of data transfer, authorization and access control and audit and data integrity to develop the safety standards of the grid database. In addition, there is the need to make sure to take adequate measures to deal with the impact of worms and viruses.

3.3.2 Increase Research of Grid Database Performance Monitoring

With the grid database technology shifted from the fields of scientific research gradually closer to new applications of people's lives, along with traditional database monitoring system can not well adapted to the grid database performance monitoring. Therefore, there is the need to enhance research of the grid database performance monitoring system that is useful for the implementation and expansion of new applications of grid database.

3.3.3 To Carry Out the Research of Grid Database in the Field of Artificial Intelligence

Data mining built on a grid database platform combined with grid computing ideas and technical advantages is able to efficient processing, analysis and mining of wide-area distribution of vast amounts of data, with a view to their application to expert systems, artificial intelligence.

4 Conclusions

With grid technology increasingly widely used in the database , the grid technology provide a wider space for the development of the database, Grid database technology which combines grid technology and database technology has good prospects for development to solve data access and integration under the Internet environment. Grid as an important emerging technology there are a lot of controversial content, and how grid database rapidly and steadily develop remains to be the people to further study.

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