Research on the High Robustness JavaEE Enterprise Development Mode Based on Hadoop and Cloud Servers

Kun Liu

Abstract

In this paper, we conduct research on the high robustness JavaEE enterprise development mode based on Hadoop and cloud servers. The current virtual machine real-time migration can only achieve manual migration, and cannot achieve full-automatic migration. In other words, when the server overload requires the administrator to artificially select a low-load host, and then hit migration command to implement the migration. In recent years, the Hadoop is becoming popular, and the read performance of the data is measured in terms of the time overhead for reading the required data. The key to reducing read time is to optimize that Hadoop cloud data read time and the RDBMS data query time. This paper integrates the mentioned techniques to construct the novel JavaEE enterprise development pattern that will promote the further development of the related techniques.

Keywords: High Robustness, JavaEE Enterprise, Hadoop, Cloud Servers.

Introduction

In recent years, with the rapid development of electronic information and Internet technology the new application system architecture has been paid more and more attention by people from all walks of life. This is based on Web technology Browser/Server Architecture, referred to as B/S. At present, the application software structure system is used in the Internet to replace the traditional C/S architecture, the development of TCP/IP protocol-based, Web-focused internal applications system that is being advocated by many companies well respected. From the function, satisfies the data is does not have the question completely using the platform development request. But from the technology, the Java use difficulty must be bigger than Microsoft's asp and .net, only through Java elementary knowledge and J2EE development kit training, and if does not have the actually Java procedure development experience, must cause the data to apply the platform establishment above Java that has the technical difficulty big problem. After the practice exploration, it establishes the practical Java procedure development frame can reduce the Java procedure development difficulty regarding begins studies Java is reduces the procedure development difficulty and the enhancement feasibility measure.
In recent years, the Hadoop is becoming popular, and the read performance of the data is measured in terms of the time overhead for reading the required data. The key to reducing read time is to optimize that Hadoop cloud data read time and the RDBMS data query time. RDBMS data query is essentially the data comparison operation, it and the overall database size, the CPU performance, the number of tables in the database, the number of records in the table, the size of each record data and the complexity of the query are difficult to give specific of the time model. The figure one shows the principles, in the later sections, we will discuss in detail.

The Proposed Methodology

The J2EE Development and the Java Architecture. In the JavaEE based enterprise application system development project management, design and implementation of the data persistence layer has been the focus of the research and development of enterprises. At present, there are many lasting solutions to achieve, such as JDBC, EJB and ORM. In these schemes using JDBC directly running efficiency is the highest, but the DAO and SQL objects he engaged in language too closely; the EJB is powerful, but the use of complex and flexible enough and ORM is a relatively ideal solution.

Accordingly, the primary techniques can be organized as the follows.

- OBS systems use JSF presentation layer model driven framework is a set of the events, the framework provides a series of UI components used to display and Render, UI value
provided based on the Backing Bean and Bean properties binding and dynamic updating mechanism, can use the system to provide a custom converter is used to display and type conversion.

- The data acquisition interface in the BS system uses the Web Service interface as the message communication mechanism. To ensure the scalability of the acquisition protocol specification, the OBS system data collection interface uses XML format to express the message and file data. The billing system publishes detailed format of the Web service interface and contents.
- Labelling is in the Java language tremendous change, used massively in the OBS system realization has labelled. May simplify the JavaEE application procedure through the labelling use the issue process as causes the development personnel to be possible extricates from the code and in the issue document synchronization.

**The Cloud Server.** The tradition memory system data integrity inspection mainly is based on the visit, like the online memory system, the mass memory system as well as the database memory system and so on, these systems visit on the server frequently the data, increased the server burden, wastes the network seriously the band width resources. The current virtual machine real-time migration can only achieve manual migration, and cannot achieve full-automatic migration. In other words, when the server overload requires the administrator to artificially select a low-load host, and then hit migration command to implement the migration. When the virtual machine can also be less manual, but the current size of the data center is often thousands to tens of thousands of servers, when there are dozens or even hundreds of high load occurs, it is clear that the efficiency of manual migration is very low, and may delay the migration of some of the reasons for a long time server overload or even downtime. And accordingly, the cloud server can be then separated into the listed aspects.

- Platform service. This is an application can be regarded as a set of infrastructure services layer, which includes middleware as services, messaging services, as then integrated as a service, information service, such as connectivity as a service, service is mainly to support application.
- Infrastructure service. The foundation structure service level is the cloud service “the first floor”, is a set of physical property, like the server, the network equipment, as well as provides the memory floppy disk as the supplies service to the user and so on. Here service support application procedure foundation structure and more users.
- Application services. Application services are running in the cloud applications and according to the requirements as a service to the user. These applications provided in the form of a web service, the user through the UDDI lookup or use these services.

UbiCloud is a cloud computing system designed to address the needs of the complex computing resources for general weak endpoints that enabling seamless invocation of server-side software on the weak endpoints and resource integration. The application software is one kind of novel computation resources, we need to know this resources some basic informations, and while for example: Service type, transfer parameter, support informations and so on MIME type, simultaneously we also need to understand this computation resources the visit way, how namely does transfer this basic application procedure, for example service agreement, IP address and port and so on.
The Hadoop. Hadoop MapReduce is an easy-to-use software framework that allows applications written on it to run on large clusters of thousands of business machines and in parallel to handle the T-level data sets in a reliable fault-tolerant manner. In the cluster, file by Hadoop block for storage, and as Map/Reduce frame input data sources, Map/Reduce will according to the file size and the size of Block decided to make the number of splits, and therefore decided to generate the number of Map tasks and Map tasks to get records of the iterator according to the splits, to read records and generate key/value to call the custom map function, this is a continuous cycle until all the data so far. Under this basis, we can then cut the Hadoop architecture as the follows.

- **Reducer** reduces the set of intermediate values associated with a key to a smaller set of values. Implementors of the reducer need to override the JobConfigurable.configure(JobConf) method, which needs to pass a JobConf parameter, the purpose is to complete the reducer initialization work.
- **Mapper** is inputs the key value to map to a group of middle form key value to the set. Hadoop the MapReduce frame has one map duty for each InputSplit, but each InputSplit is produces by this work InputFormat.
- **Because the Reduce task does not have the task locality,** when the resource manager receives the heartbeat information of the idle resource node to request the task allocation, the idle resource is allocated to the operation of the resource application. Job to determine whether the CPU and storage resources of idle resources to meet the needs, if satisfied, from the Reduce task to be assigned to select a task placed in the node.

For the systematic testing, the core code of the Hadoop is shown as follows. In the shuffle phase, the data transfer from the map end to the reduce end uses the Http protocol. Http is built on the request/response model, first by the customer to establish a link with the server TCP, and sent to a request to the server, the request contains the request method, URI, protocol version and the related MIME (multi-purpose Internet mail-extensions) style message. The server responds with a basic status line containing the protocol version of the message, a success and failure code, and a MIME-style message containing server information, resource entity information, and possibly resource content.
The High Robustness JavaEE Enterprise Development Suggestions. Java programming framework can reduce the difficulty of the Java program development, which is the consensus of the program development community, so that the Hibernate, Strus, Spring and other frameworks are very popular, but the use of these frameworks for non-experienced computer professionals, Although they are strong, advanced design, scalability, the feeling of these frames around the bend too much, not suitable for a particular system of the information processing, it is difficult to apply these popular framework to their own Java project development. Here, we give the listed suggestions.

- The Struts frame was the Web application has provided an general frame, how could such development personnel solve manager in the actual problem. At the same time, Struts also can in the suitable place expansion connection, enable the application procedure to expand this frame better adaptation user's actual need.
- Hibernate is a java-based open source persistence of middleware, it made a lightweight the JDBC encapsulation, provides not only the ORM mapping services, also provides data query and data cache function, Java developers can easily through the Hibernate API to manipulate the database. A growing number of Java developers use Hibernate as enterprise application and the relationship between the database middleware, to save and object persistence JDBC programming about 30% of the workload.
- MVC model, the model view controller model, whose core idea is to divide the program code into 3 components that are relatively independent and can work together. MVC weakens the coupling between business logic interface and data interface makes software maintainability, maintainability, extensibility, flexibility and the encapsulation.

Besides these, we should also provide the suggestions on the agile development. (1) Refactoring refers to reorienting and optimizing the internal structure of the system to reduce complexity, eliminate redundancy, increase flexibility and improve performance without changing the behavior of the system. By refactoring to improve the design of existing code is correct, but the reconstruction can easily be misused. If, as some people understand, refactoring means designing continuously at the development time, there is a problem. (2) Agile processes promote "writing tests first, then coding". Driver code and failed test cases design that can reduce unnecessary construction. Developers must ensure that unit testing and integration testing operation and correct all the time, even the scene of the customer representative is to be able to write functional test program. (3) At any time requires the design of the code as simple as
possible, just to meet the needs of the current function, not many also a lot of. Guided by a simple metaphorical description of how the whole system works.

**Conclusion**

In this paper, we conduct research on the high robustness JavaEE enterprise development mode based on Hadoop and cloud servers. With the server virtualization technology in the cloud computing data center applications, the rapid development of virtualization technology, including the virtual and the virtual machine real-time migration technology has become an important development branch of the virtualization technology due to the advantages of resource integration, load balancing, energy saving and power saving, and routine maintenance. However, the current real-time virtual machine migration can only be manually selected by the administrator to migrates the virtual machine and the receiver physical machine, when the high load of virtual machine too much the efficiency of manual migration is very low. Along with computer network unceasing development, the people more and more are also high regarding the data storage request, specially emerges in cloud computation under background, becomes the attention based on the magnanimous data cloud memory system the hot spot. Under this basis, this paper proposes the JavaEE enterprise development mode based on Hadoop and cloud servers that will promote the development of the enterprise application design.

**References**


