Research and application of ASP technology in dynamic web page design

Hu Rongqun[1], Li Wenying[1]

Abstract. With the rapid development of modern network technology, dynamic web page has become the mainstream in today's web production of electronic commerce enterprises. In view of this, the characteristics and performance of dynamic web page design based on ASP technology were studied in this paper. The characteristics and performance of the dynamic web pages in ASP technology were analyzed by improving the access performance of the large dynamic web database, the decision diagram, the types of the data packet structure, the logical functions and the functions of the page. The results show that under the support of ASP technology the decision diagrams can express the database information clearly at the same time, which provides flexible and fast information exchanges, secondly, the efficiency of data paging is improved obviously and the database is greater, and the effects are more obvious.

Key words. ASP technology, dynamic web page design, application.

1. Introduction

With the in-depth application of Internet and the development of ASP technology and database technology, on the one hand, people in the world wide web are urgent to access and release a large amount of information, and most of these information exist in database; On the other hand, rich and colorful multimedia information and a large number of multi-format data cannot get solution through traditional database technology. Therefore, the combination of ASP technology and database technology is the inevitable trend of the development of computer network technology and it is also the key point of the Internet applications [1].

ASP script on the server execution and it can be spread to the user's browser just through the ASP implementation results in the generation of the conventional HTML code, which can avoid the loss of writing program annihilated by the others, and it also can guarantee the safety of the source code. Third, it has higher execution efficiency [2]. ASP can connect with SQL server, Oracle, Access, VFP and other database, and it uses some special techniques of collections of objects such as ADO,

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[1]Nanchang Institute of Technology, Nanchang, Jiangxi, 330044, China

and they are used in the same process on the server, so it can deal with the page requests of customers faster and more effectively [3].

The remainder of this paper is organized as follows. The second chapter briefly introduces the ASP dynamic server page technology and related knowledge of background database of ASP (Dynamic Server Page Technology) dynamic web page. The third chapter introduces the research methods through the improvement of the access performance of large dynamic web database, the decision diagram, the data packet structure type, the logical function, the paging function and so on. In the fourth chapter, based on the analysis results of the sample data, the performance of dynamic web page design based on ASP technology is studied and analyzed. The fifth chapter is the conclusion.

2. State of the art

2.1. ASP dynamic server page technology

ASP technology (active server pages technology) is a kind of open scripting environment developed by the Microsoft that runs on the server side, and it closely connects with script development and improves the flexibility of programming, which reduces the difficulty of development [4]. The code is interpreted at one end of the server, and the contact server is responsible for all the script processing, and it generates standard web contents to the browsers [5]. So there is no specific requirement for the client browser and the source code will not be transmitted to the other browsers, which makes the technology have a wider application prospects [6].

ASP file is a plain text format, so you do not need to compile and you can directly run it on the server, so ASP application is analyzed in the Web server, and the browsers only receive and process pure HTML flow. In the entire process, the browser completely does not distinguish HTML and ASP pages, and it does not know how to deal with the ASP server, but the ASP program is transparent for the browsers. Strictly speaking, people should not say "dynamic pages" and "static pages", because the "dynamic state" and "static state" are actually collection terms that are related to the concepts of the database, so the correct statements are "dynamic web site" and "static web site", and the page belongs to a single term, so we can say that this page is dynamic or static, which means whether it has a real-time link with the database.

2.2. ASP (Dynamic Server Page Technology) dynamic web page background database

Formal dynamic web sites must have database service support in the background. The so-called "database (Date Base) base" refers to the record data files that are stored according to a certain format. In daily life, personal address book, company accounts thin, customer lists, the details of check and performance are database. They have not only fixed format but also characteristics, and they can be recorded with tabular forms. Because the database has the advantages of automation man-

agement, rapid query and statistics and it strengthens the original keyword to carry on the data processing, storage and sampling, so as to ensure the integrity of reference of the dynamic web database, which is stored on the server side, and from the beginning of the compilers, it is helpful to achieve the updating, inserting and deleting function of dynamic web page design based on ASP technology.

Background database of ASP dynamic web page uses SQL Server database management system. The database management system closely integrates the network service, and due to complicated operation of SQL Server and Microsoft's web server IIS, the users do not need complex operation and they can directly use the ODBC or ADO data driver provided by SQL Server, and through the browser they can obtain information provided by SQL server. Secondly, we can use the network environment effectively, so that all the database query actions are focused on the server, and it can effectively reduce the network traffic. Figure 1 shows typical applications of dynamic pages.

Fig. 1. Application of dynamic pages

3. Methodology

Regardless of the distance of the database server, the database administrator can use SQL enterprise managers to manage all the servers in a central location, which will greatly reduce the cost of multiple servers, and it can maintain the dynamic backup of the database at the same time, and it still has the ability to provide numbers, which allows users to update or read the database content to cope with the requirements of the task of oriented programs. In addition, distributed transaction processing of Server SQL allows the workstation to access data on several SQL Server servers at the same time, and it also allows developers to design distributed applications. According to the analysis above, ASP technology in the key technologies of dynamic website mainly includes: display technology of paging of ASP development process, query technology in dynamic web database query process, optimization strategies of dynamic web database access based on dynamic web database and the analysis technique of data packets, and the relation schema is
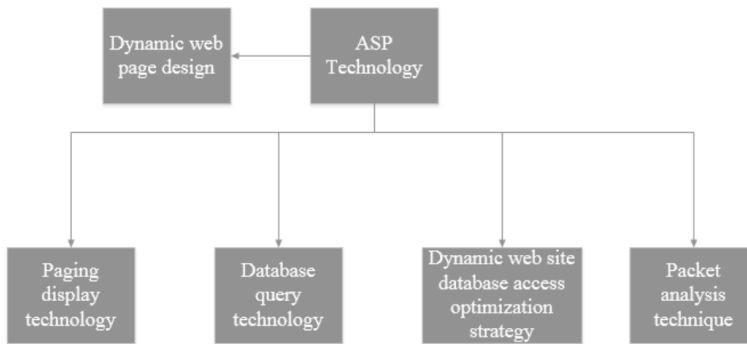
depicted in Fig. 2.

Fig. 2. Frame of dynamic web page design analysis

The traditional C/S structure is generally divided into the client and the server, but with the rapid popularization of Internet, the calculation whose center part is the computer network has been got attention, and two-layer C/S structure has low efficiency and it is difficult to maintain, and the security is poor, which cannot meet the actual needs, so the extension of two-layer C/S structure is the three-layer C/S: the client is used to provide a visual interface for the users, which is mainly responsible for information representation and data collection; application servers usually make responses to the user's requests and carry out certain application logic, which is a bridge of connecting the client and the database volatility; the database server in the operation carries out database management system, which realizes the definition, maintenance, access, update and management of data and responses the requests of application server of data. The three-layer C/S structure has high efficient, and it is easy to maintain and it is very flexible.Based on dynamic web design of ASP, it has the following basic characteristics: first one is the interaction, the page will make changes and responses according to the user's requirements and selection dynamically, and the real-time exchange of data is made too, and the browser, as a client, become a bridge of the dynamic exchanges, and the interaction of dynamic web page will be the development trend in the future. Secondly, it can make automatic updating, which means that it does not need to update the document manually, and it will automatically generate a new page, so that you can greatly save the workload. Third, it will appear different pages when different people visit the same website at the same time.

One of the key problems of carrying out effective on-line man-machine interaction on the dynamic web page is to improve the access performance of the large-scale dynamic web database, which means to reduce the searching time of large amounts of data to meet the complex interaction. Therefore, for the server, the optimization of database access has become an important tool to improve its efficiency. Through the optimization of a variety of query processing options, the most appropriate query strategy can be selected. At present, the research tool of optimization of database

access mainly depends on the query optimization theory of relational database. However, in the query optimization problems such as discovery of knowledge, online interactive services and complex multimedia objects, the optimization strategy cannot meet the requirements of the application.

Based on ASP technology of dynamic web page design, electronic commerce website is taken as an example, this type of website can realize the interaction between users and the database, so as to determine a best choice of products or services. The process of selection is a kind of decision. The decision table can be used to express the selection process easily. Multi-level selection efficiency of decision table method is low and it is not intuitive, so it needs to be converted into a structured approach based on graphics. Decision trees and decision graphs are effective ways to solve the problem.

The decomposition of the database information of the dynamic web pages based on ASP technology can be expressed by the decomposition of the logic function of variable, and the decomposition can be determined by a set of sub function factors. In this way, as long as the sub function is known, the logical function can be determined. The sub function and decomposition of the logical function are defined as follows (x means Factor decomposition of Web Design Based on ASP)

$$f_{\mathrm{c}} = f(x_1, x_2, \cdots x_{i-1}, c, x_{i+1}, \cdots, x_n). \tag{1}$$

The decision diagram is a graph based on data structure mention above, which is directed as a cyclic graph connecting the vertex set and edge set, and each non-terminal vertex is marked by the variable x (x represents the decision variable). The decision diagram expresses the logical structure of the database access. From the root node, users can ask questions, so as to find their interest by going along a path of the web page browsing, and if the users' answer leads to the determination of specific contents of the products, which indicates that the completion of a final decision is made.

The optimization of database access can be achieved on the basis of the decision diagrams, and its essence is to choose appropriate decision variables to reduce the size of decision graph (number of minimization), so as to speed up the query speed and improve the utilization rate of memory at the same time. The formula used is: (a means the rate)

$$H(A) = -\sum_{i=1}^{n} p(a_1) \log 2p(a_i). \tag{2}$$

The conditional probability formula is

$$H(A|B) = -\sum_{i=1}^{n} \sum_{j=1}^{m} p(a_i, b_j) \log 2p(a_i|b_j). \tag{3}$$

According to the above conclusion, firstly, the optimization strategy of decision diagram of database access is carried out according to the following steps:

1. For the given database information, the truth table of the logical function is obtained according to the method described above.

2. The decision diagram is made (each vertex is determined by the current minimum value of the variable basin) through the equation selection variables.

3. A query sequence is formed in accordance with decision graphs.

Secondly, for the dynamic web database based on ASP technology, in this paper, the function of the page display is studied by creating a stored program in the database. The main parameters stored include the following parameters.

1. The current page.

2. The number of records that are set at the current definition of each page, which can be used to modify the number of pages in the page program based on the needs of it. Of course, if the scalability of the program is not considered, each page that has N records can also be directly provided;

3. An output parameter that is derived from the database and records the total number in the current table.

4. Result analysis and discussion

4.1. Decision diagram analysis of dynamic network design based on ASP technology

The benefit of decision diagrams is that it can provide concise and flexible expression and human-computer interaction of dynamic web database information based on ASP technology, especially in the application of online shopping. The classification of database can be in line with people's decision thinking better, and customers can buy goods through the visual navigation of the decision diagram. This paper believes that the method which is constructed by using information theory can be applied to the dynamic e-commerce web page based on ASP, and it also can be widely applied in logic design, computer aided medical diagnosis, artificial intelligence and other related decision-making problems (see Table 1). The first column in the table represents the event set and the second column represents the browsing feature of the product of users, and the third column is the logical function.

Table 1. Analysis of decision graph

S	$X|x_1 \ldots x_n$	f
S1	1 0 ... 1	1
S2	0 2 ... 2	2
...	...	...
SK	2 3 ... 2	7

The decomposition of ASP technology is shown in the above table. Because these factors can be divided into the speed, redundancy and so on, people can analyze the technology by studying such few factors.

This helps to test the technical efficiency of ASP. On the other hand, SQL Server is allowed to deal with a single distributed processing, and the number of different

server data is updated, which still can maintain the integrity and consistency of the data. If the workstation or any server is invalid, all the changes on the server will be canceled automatically, and the state will be restored to the former state.

4.2. Analysis of the page display of ASP technology in the dynamic web page design

In order to test the new method above, this paper chooses the database tables with different size, and it respectively takes old paging method and the new method that is previously proposed for paging, then we record the time displaying in each page, and the test data and test results are recorded in Table 2.

Table 2. Time spent on the web page from request to display (s)

Data on the page	Traditional paging method	Improved paging method
100	0.5	0.4
500	0.7	0.5
1000	1	0.8
2000	2	1
5000	4	1.5
10000	7	2

From the test results, we can clearly know that the paging speed significantly increases, and the larger the data table is, the more obvious the effects will be when using this paging method. In the dynamic web page based on ASP technology, the new paging method returns only one page of record each time and forms a set of records, in addition, the client can use two-dimensional array to store data without traditional Vernier method that uses rs.next to output Recordset record, and the speed of read has been improved and the database does not use temporary tables, which greatly improves the speed of dump records. Third, using a rolling cursor, and the cursor can complete the positioning only after two operations, and its speed is also greatly improved. In addition, in the processing of tree structure and database operations, you can also use a number of methods to further improve the speed. So ASP technology is widely used in dynamic web page design, and because the ASP technology has driven force and the oriented-object, therefore, the formation of dynamic web page in this design pattern can make data analysis for the browsing preferences of users and other information, which has important significance on creating composite browsing preferences of dynamic pages

4.3. Packet analysis of dynamic web page based on ASP technology

The steps of capture research and analysis of network data packet are as follows: open the form to realize the initialization and automatically obtain the IP address of the machine. If there are multiple cards that can be respectively regarded as objects of getting data packets, then you should bind the Socket, and the local area network captured can get data packet interacted by the local network adapter and

the captured data packets are listed in the form of a list. The contents have elapsed the passing time of data packets, the protocol, source IP, destination IP, source port, and destination port and packet length. The details of the package are listed in Table 3.

Table 3. Details about data packet

Type of information	Value
Start time	2015-7-18 15:55:39
Source address	220.181.131.239.80
Destination address	192.168.0.121:15849
Protocol type	Top
Survival time	47
Version information	4
Header size	20
Message length	40
Priority	Routine
Delay	Normal Delay
Throughput	Normal throughput
Reliability	14319
Check sum	1AF2

In the generation process of actual dynamic page, it is necessary to make treatment after collecting the data packets, like cleaning dirty data or adding incomplete data, to ensure the integrity and consistency of data structure, and the host log and network data packets need the respective unification with log format. We can conclude that current Web database technology mainly achieve the seamless connection between Web and database through the expansion of servers or clients.And ASP is a very ideal tool of making dynamic web pages and web database development in the B/S mode established by the Microsoft, in addition to providing all the features of CGI and ISAPI, there are many significant advantages: first, ASP technology can make operation easily and it uses a simple foot language, and it combines with HTML code, so that it is easy to write and it shortens the development time of dynamic web page, and it supports almost all of the scripting languages. Therefore, the production of ASP file is very simple and you can use any plain text editor, and in writing ASP application, you just need to enclose the script of special markers of ASP without compiling or connection, so you can directly execute on the servers, forming a dynamic web page. Secondly, the security is good and the ASP source code does not leak. Users only need to use the browser to explain the conventional HTML code, and you can browse the web page designed by ASP.

5. Conclusion

This paper discusses the advantages of ASP application in dynamic web page design and expounds the method of making remote maintenance by using ASP technology in the development of dynamic web page. In the display of dynamic web page, it provides a new method: in dynamic web query, the new methods of fuzzy query and multi-keyword query are put forward to guarantee that they can still find the reasonable results in the course of the input of uncertain keywords; in the optimization of access of dynamic web page, constructing decision graph is proposed as a new method.With the help of the concepts of Shannon's information theory, the method can effectively realize the optimal access to dynamic web pages.

The application research of ASP technology in dynamic web page design is divided into two steps. After obtaining the sample data, first of all, the injury data of soccer players are classified and analyzed combined with the details of dynamic web page design (including decision diagrams, paging technology, conditional probability of factors analysis) of ASP (active server pages), and the data packets got in the process of the formation and storage of dynamic pages are analyzed systematically. From the analysis what can be obtained is that the dynamic web site can form the user's page efficiently and rapidly with the new paging method; in addition, in the process of acquiring data packets, it needs protocols between different network layers and the message should be studied and analyzed to obtain the key information for dynamic web page, so thee dynamic web page design based on ASP involves various network protocols, types of data structure, machine language and so on, and it is also an advanced web page with multi-directions that contains computer languages, algorithms and protocols.

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