A Commonly Used Application Method of Web Database Technology

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Abstract. This paper first expounds the working principle of Web database technology and provides the B/S model of Web database connection. Then it gives the most mature and effective method, implementation model and architecture of Web and database connection. Finally, A solution to the main problems in the implementation of this method is proposed.

Introduction

Various automation systems, such as office automation and command automation, generally have their own database resources, and how to easily and efficiently query, manage, and use the database becomes the key to verifying the success of the automation system.[1-3] Web database technology provides a very effective way to solve this problem. Web database technology is a combination of Web technology and database technology. The browser/server model is used. Users do not need to consider the software and hardware environments such as database type, operating system, and model. They only need to browse through a simple client software. The device has access to all information that is allowed on the intranet.

Web and database connection

B/S model. The Web database uses the browser/server model. B/S is a new computing model developed from the traditional client/server (Client/Server) and is called the three-tier structure C/S. The original C/S talks through the message passing mechanism, and the client sends a request to the server, and the server performs corresponding processing and sends it back to the client through the delivery mechanism. The model is shown in Figure 1.

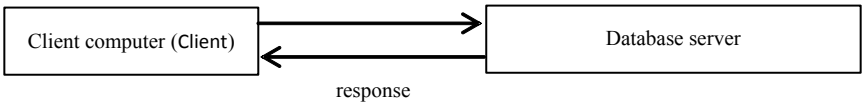

Figure 1. C/S model

The Web model further decomposes the server side of the C/S model into an application server (Web server) and one or more database servers, as shown in Figure 2.

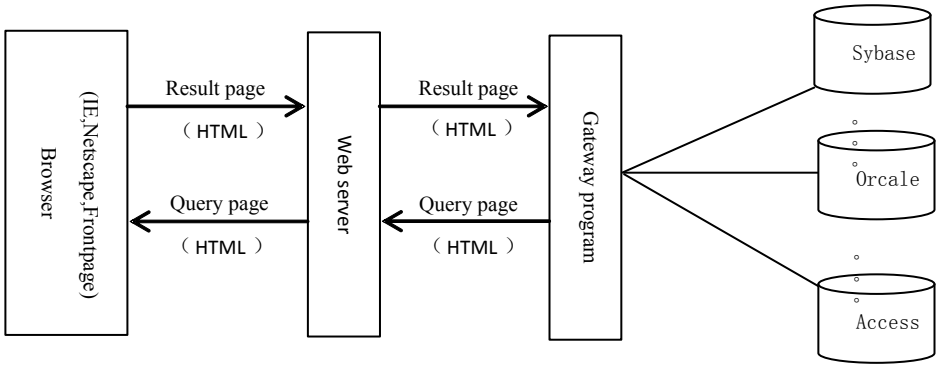

Figure 2. B/S model

In the original C/S model, all clients need to configure several layers of software, such as operating system, network protocol software, client software, development tools and applications, so they need to do a lot of work on the client side, but on the server side. It is a pure database server. The Web model simplifies the C/S client by simply installing the operating system, network protocol

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software, and browser, while the server side concentrates almost all of the application logic, development, and maintenance. The role of the browser is to download the app from the web. The Web application server organizes information into distributed hypertext, describing and organizing information through Hypertext Markup Language (HTML) and Hypertext Transfer Protocol (HTTP), and simple and practical implementation of the entire Internet space. Hypertext/hypermedia data access.

The integration of the Web and the database is not a new technology. As early as the birth of the Web, the public gateway interface CGI (Common Gateway Interface) can be used to dynamically access the enterprise database. With the rise and development of Intranet, the connection between Web server and database server is becoming more and more important. Many manufacturers are constantly introducing new technologies and new products, making the connection more concise, quick and convenient. Web and database connectivity technologies have become the core of Web-based information management systems.

CGI technology and ISAPI technology.

Working principle. CGI is a set of uniformly named environment variables and methods used to pass information between a browser and a server. Searching, modifying, or adding new data to the database can be done by developing a CGI program for the connection between the HTML form and the database.

ISAPI (Internet Server API) is a standard application programming interface that web developers can use to write interactive applications. The ISAPI Extension application has the same functionality as a CGI script and works similarly.

CGI, how ISAPI works:

(a). The customer submits a query request form or clicks on a hyperlink in the HTML page to launch a CGI or ISAPI application;

(b). The browser passes the request to the web server;

(c). The web server verifies the user rights. If the user has the appropriate permissions, the environment variable is used to pass the information to the corresponding CGI program or ISAPI program, and then started;

(d). The CGI program or ISAPI program logs into the database server, queries the condition, and formats the result into an HTML page for return to the client.

Evaluation.

(a). In terms of performance, ISAPI applications are significantly better than CGI applications. The ISAPI application is compiled into a Dynamic Linked Library (DLL) that is loaded into memory when the WWW Service is started. It requires less system overhead because each request does not start a separate process; if CGI is used as an interactive program, an external program needs to be started for each interaction, which increases the system overhead and is subject to real-time applications. limit;

(b). In terms of implementation and maintenance, CGI applications are significantly better than ISAPI applications. Because ISAPI applications are compiled into dynamic link libraries, you must restart your computer every time you debug or maintain, and you need to know some about writing ISAPI applications. Programming expertise, such as multi-threading, process synchronization, direct protocol programming, and error handling, is complex; CGI enables the Web to integrate with its back-end information with minimal program complexity, becoming a common support for multiple types. Environment, commissioning and maintenance are relatively simple;

(c). ISAPI is poorly portable, and applications developed can often only run on the corresponding web server. But ISAPI allows pre-processing of requests and post-processing of responses (Post-Precessing of responses). ISAPI Filtering can be used to customize applications that implement authentication, file access permissions confirmation, and log management. CGI does not have this feature.

Construction of Web Database System

The database system adopts a combination of centralized and distributed architecture, and the database with high sharing requirements, high security and reliability, and large amount of information is concentrated in the network management center. This large database system can adopt Orcale or Sybase, etc.; according to different applications, Some units and departments have established local small-scale database systems. Such small database systems can use Access, Visual Foxpro, Excel, etc. All these distributed and centralized database systems cooperate with each other through the Web server system, coordinate work, provide various services such as query, modification and maintenance of the database, and form a Web database system with reliable performance, simple maintenance and convenient use.

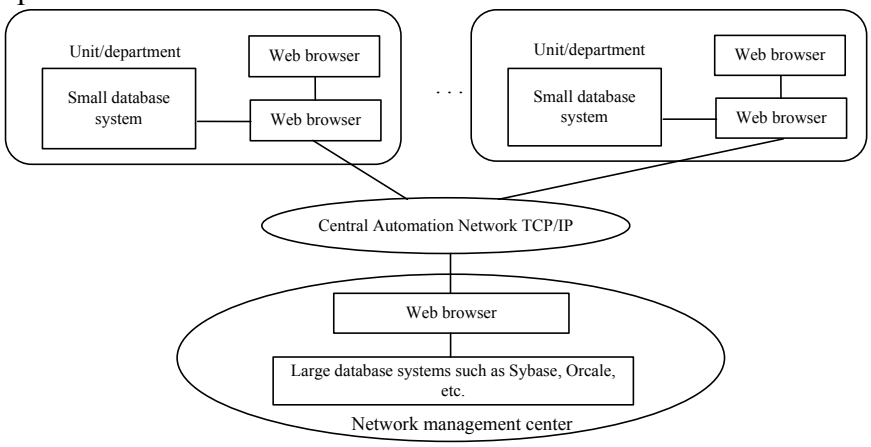

Figure 3 . Web database system architecture diagram

Web database development

In view of CGI, ISAPI technology is relatively mature, applications are more common, and Windows NT embedded ISAPI application - database connector software IDC, you can choose CGI and ISAPI combination for Web database development, that is, using CGI development, debugging is simple Features: In the early stage of development, first use CGI for programming and debugging; using ISAPI system with low overhead and good real-time performance, in the later stage of development, the EXE application written in CGI is converted into DLL dynamic link library application.

Within the center, each unit can independently establish various database systems according to their respective needs, such as: ORACLE, SYBASE,

FOXPRO, INFORMIX, ACCESS, etc. There will be their own application systems and management systems accordingly. In order to meet the needs of the central automation system, a central level information management system must be established. For different database systems, CGI and ISAPI have to write different applications, which are very difficult for programming implementation and daily maintenance. Therefore, there is a need for an operating platform that can access a variety of database systems.

Microsoft's Open Database Connectivity ODBC provides a way to solve this problem. It provides a unified interface that makes operations independent of the database system. The open database interconnect is actually a database access library that contains the ODBC drivers required to access different databases. To operate the FOXPRO database, use the FOXPRO ODBC driver; to access SYBASE, use the SYBASE ODBC driver. In short, the application needs to operate different types of databases, just call the functions supported by ODBC and dynamically link to different drivers.

ODBC uses a unified user interface to connect to multiple ODBC databases, making it easy to create programs that interact with multiple databases by using a unified interface standard that connects to the database. In theory, for all databases, you only need to write an access program. Therefore, CGI, ISAPI and ODBC can be used for web development.

CGI, ISAPI and ODBC work together:

(a). The user clicks the submit button on the form or clicks on the hyperlink to the CGI, ISAPI program on the HTML page;
(b). The browser sends a request to the web server;
(c). If the user can access the CGI, ISAPI program, the web server passes the user request to the gateway program;
(d). The gateway program reads the input data and formats it into a data format available to the database, and then passes the data to ODBC;
(e). After receiving the request data, ODBC passes the data to the corresponding database interface (provided by the database software) after analysis and processing;
(f). If the data passed to the database interface is legal, the database interface performs a database query and returns the result to the gateway program;
(g). The gateway program generates an HTML file for displaying the result and returns the result to the web server;
(h). The web server passes the query result to the browser;
(i). The browser displays the resulting HTML page.

Summary

Web technology is an emerging technology, and the many advantages of the Web have enabled the Web to grow rapidly in recent years. Web technology is a technology that spreads other technologies, and the technology of communication itself forms the Web. That is to say, Web technology is a combination of many other technologies, including network, communication, graphic images, images, animations, and other technologies. Worth further research and development.

In recent years, Microsoft's ASP technology has been widely used in Web development. It is easy to program and debug, and easy to maintain. It is recommended to be preferred in the web development of office automation systems for corporate or campus networks, but due to VBScript. The statement is directly embedded in HTML, which makes the security poor. It is not suitable for the development of military command automation network. For the development of military command automation network, it should adopt more relatively traditional traditional development tools, such as CGI and ISAPI technology described in this paper.

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