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The Choice of Methods and Tools to Implement the Database and the Web Interface

[1]Mohammed Qasim Dhahir, [2]Haider Hassan Majeed Al Karaawi and [3]Muneer Sameer Gheni Mansoor
[1]The Iraqi Ministry of Higher Education and Scientific Research, Department of English Language, University of Kufa, Kufa, Republic of Iraq
[2]The Iraqi Ministry of Higher Education and Scientific Research, Department of Public Health, University of Kerbala, Kerbala, Republic of Iraq
[3]The Iraqi Ministry of Higher Education and Scientific Research, Department of Computer and Communication Engineering, University of Information Technology and Communications, Karbala, Republic of Iraq

Abstract: Currently, a large number of different information systems are used which are designed to automate various processes. To solve such problems, both ready-made and own development of software products are used. With the development of computer communications, it became possible to provide services via. the web-interface. Web-interface allows you to clearly distinguish the logic of data generation on the client with their processing on the server. A centralized server allows you to access it for various applications, regardless of which platform they are running on. There are several advantages of using the web-interface for building automated enterprise management systems: the ability to access data management from anywhere in the world via. the internet via. http protocol, ease of use, intuitive understanding. In addition, after creating a new version of the web application, it does not need to be installed on all computers it's enough to install it on the server. The choice of a particular hardware platform and configuration is determined by a number of general requirements due to the characteristics of modern computer systems. They include: the ratio price/performance, reliability and fault tolerance, scalability, compatibility and portability of a software. To create a database and a web interface for remote database access one can use various tools. It is also necessary to choose for a Web server a hardware, an operating system, a software, a database management system and alanguage of programming or making a scenario. When choosing, one should remember that these components are interconnected. For example, not all operating systems can run on a particular hardware, not all languages scripting can provide connectivity to all the databases, etc.

Key words: Web server, server software, MySQL database server, PHP: Hypertext Preprocessor, architecture of web databases, Iraq

INTRODUCTION

The choice of the methods and the tools to implement the database and the web interface works in a dynamic manner (style), retrieving writing (content) from a database and incorporating it into current template to build the page. The main content is integrated into the 'central' part of the page but around the periphery of the page. Other 'modules' are carried out differently. Lists of 'most popular', 'most recent' or 'related' articles can be incorporated into the page. Polls allowing people to vote on issues, newsletter and sign-up can be integrated. There are modules for PayPal donations in 2018. The world of web development is flooded with JavaScript frameworks, node packages, pre and post-processing tools and complicated dev-ops which can be regarded as the most favorite for the present research. The expectation is that every website should be built on a CMS of some kind.

As a matter of fact in 2018, web developers widely use these modules to develop web interface or content management system of some sort. According to W3Techs, Joomla powers state that 3.1% of developers of all sites use these modules on the web, although, they use them in a wrong way and different from what is presented in this study. This percent increases as do the popularity of other CMS systems.

MATERIALS AND METHODS

The web server: A web server is a software responsible for accepting browser requests, search of specified files and return their contents.

Corresponding Author: Mohammed Qasim Dhahir, The Iraqi Ministry of Higher Education and Scientific Research, Department of English Language, University of Kufa, Kufa, Republic of Iraq

Web server a server that accepts HTTP requests from clients, typically web browsers and issuing them HTTP responses, usually together with an HTML page, image, file, media stream or other data.

The information available to internet users, is located on computers (web servers), run by some special software. Much of this information is organized as web sites. Each of them has its own name (address) in the internet.

The web site information is presented in a certain form that is located on a web server and has its own name (address). To get an access to web sites on the personal computer one uses special programs called browsers. Depending on the name (address) of the website, we specify the string "Address", the browser will load the relevant information.

The web site consists of some linked web-pages. A web page is a text file with the extension *.htm which contains textual information and special HTML-codes that define in what form this information will be displayed in the browser window.

All graphic, audio and video information on a web page is containedin a separate file with the extension *.gif, *.jpg (graphics), *.mid, *.mp3 (sound), *.avi (video). In the HTML code of the page contains only the reference to such files.

Each web site has its own internet address which consists of a site address and name of the file corresponding to this page. Thus, a web site is an information resource, consisting of interconnected hypertext documents (web pages) hosted on a web server and having a unique address. Anyone with a computer connected to the internet can see web site.

Currently, a few dozens of programs that implement these functions are developed and widely used. There is a number of such programs, for nearly every operating system. Some of them do not depend on the operation system and can be used simultaneously in different OS.

But the vast majority of web servers are focused on the use of only one operating system. Among them there are commercial programs, distributed free of charge. Sometimes web-servers are only part of the functions inherent in the program.

In addition to the minimum set of tasks that define the basic functions of a web server, most software containsome additional features.

These include the restriction of access rights to some individual documents, the ability of cryptographic protection of transmitted and received data, generation on a single computer multiple web servers with different domain names that use non-standard ports-of-entry for the server. In addition, web servers often need support for working with database management systems and languages Perl, Java, PHP Hypertext Preprocessor.

In addition to a set of functions, a significant impact on the choice of web server providing easy set up and ease of administration. Important for high visited servers is also the speed of response of the program to the customer's request.

Today the indisputable leader among web server is a freeware Apache server. The five leaders also include microsoft internet information server, Netscape, etc. (Anderson *et al*., 2010; Allsopp, 2009; Adams *et al*., 2007; Duckett, 2005, 2013, 2015; Dronov, 2014, 2016; Tittel, 2015; Horton and Quesenbery, 2014).

RESULTS AND DISCUSSION

The review of server software for different OS: Now, available web-servers for all major platforms including various UNIX versions, Windows NT, Novell IntranetWare Company (an optional component of NetWare 4.x), OS/2 Warp, Mac OS and even Windows 95. Web servers have become affordable for the masses.

Web-servers are not limited to sending static HTML pages. Java and related scripting languages provide an ideal development platform for the web. A number of web servers provide their own API (Application Programming Interface) and some of them are widely known interface to Netscape Server API (NSAPI).

Most prevalent among these servers received programming method for web application scripting languages. Microsoft and Netscape included in their packages, even object-oriented tools for rapid development of programs (Rapid Applications Development-RAD), designed for serious developers. Web servers increasingly are in the form of complexes of functionality built into the OS.

Thanks to a web browser to administer the server does not necessarily always be in the immediate vicinity. In most of the products are functions of remote administration using a web browser.

The greater the number of sites involved in the exchange of confidential information, the greater the need for reliable protection and data encryption. The most common form of security used on the web servers is basic authentication where each user must provide your ID and password. Funds for basic authentication are provided to all considered servers.

The developers of some of the servers went further, allowing you to restrict access by IP address and host name.

To protect from unwanted visitors can be subjected to the information procedure of encryption. On web servers to encrypt data is the protocol level security sockets-Secure Sockets Layer (SSL).

To create a secure, encrypted communication channel between the server and browser with SSL authenticates the certificate. Agencies are authorized to issue certificates, certified servers use SSL (Plakhotnaya and Vinokurov, 2014; Chaparro-Pelaez *et al*., 2014; Kresimir *et al*., 2014).

MYSQL database server: For quite some time developed a DBMS based on the architecture "client-server". At this organization the most time-consuming operations databases run on a dedicated server computer which should be powerful enough and have a matching set resources the main and external memory.

Structure internet/intranet applications has much in common with the traditional platform of "client-server". Properly speaking, the World Wide Web (WWW) is also based on client-server architecture.

In fact, a web browser is a typical client front ends of ω which differs from the client built with Visual C++, Visual Basic, Visual FoxPro and other development tools, is more flexible configurable functionality which can be determined even during program execution.

It does not require any recompilation or reinstallation of the modules which in itself is a non-trivial task in large and complex client-server systems.

Initially, browsers were used only as a mean of formatting static text. However, actively developing Web sites soon ceased to be content with simple publications.

A typical interface of the client application involves filling by some form with different controls a customer of sending the corresponding request to the server and receiving results of processing.

Thus, the first plan was put forward the principles of dynamic interaction between the browser and the web server within a session that made you wonder how the active role of the browser and extend the functionality of the server as opposed to simple storage and shipment of the HTML documents.

Many of the manufacturers of software products released or are developing the means to publish databases in the internet. The main functions of such software products of this type are as follows:

Is to provide a display of the user interface in HTML format for display by a viewer, the customer in particular Internet browsers, to provide formation of requests to a database the most simple to the untrained user equipment, is to provide the user authentication (for access control).

To ensure processing the request and return the result in HTML format for display by a viewer user. You must keep in mind about the protection of transmitted over the network information about the appeal and comprehensibility of the interface.

For commercially produced software products of this type are characterized by a high cost of the Software (SW), hardware platforms, most DBMS. The advantages include good documentation, technical support, low cost future software updates.

We can mention the following DBMS: SQL server from Microsoft (requires a powerful database server running Microsoft Windows NT server). Sybase System firm Sybase (requires a powerful UNIX server). Informix company Informix Software (also requires a powerful UNIX server). Progress company Progress Software (running on the same hardware platform as the previous two).

All of this is very well suited for working with various projects in the field of databases. The choice of implementing one or another solution of a given task is associated primarily with the technical performance of the server computer and the operating system installed on it. MySQL is a very fast, reliable system for managing Relational Databases (RDBMS).

The database allows you to efficiently store, search, sort and retrieve data. The MySQL server controls access to data, allowing you to work them simultaneously to several users, provides quick access to data and guarantees access only to eligible users.

Consequently, MySQL is multi-user, multi-threaded server. It uses Structured Query Language (SQL-structured query language) for worldwide use standard query language in databases. MySQL came onto the market in 1996 but its development began in 1979.

Currently, the MySQL package is available as the software is open source but if necessary, you can get a commercial license. Competitors MySQL, among others are PostgreSQL, Microsoft SQL server and Oracle. MySQL has many benefits including:

- High performance
- Inexpensive
- Ease of configuration and learning
- Portability and availability of source code

Performance: MySQL works very quickly. Results of comparative efficiency checks performed by the creator, you can go into the website http://web.mysql.com/benchmark.html. Many of these commensurate checks show that MySQL is an order of magnitude faster than rivaling products.

Inexpensive: The MySQL kit is accessible free of charge in agreement with the software authorization, open origin or if it is essential for the request, for a little sum we can purchase a commercial authorization.

The simplicity of use: In much contemporary databases use SQL. If a programmer controlled with other RDBMS, the conversion to this system should not make any trouble. Setup MySQL is as easy as installing many same products.

Portability: MySQL can be exploited among many others UNIX systems as well as in the Microsoft Windows environment.

Source code: The source code of MySQL to upload and change.

PHP; Hypertext Preprocessor: PHP is a scripting language for servers created particularly the network. In HTML page you can insert PHP code that will be made each time you visit. PHP code is disclose by a web server and produce HTML or other output that is observed by the visitor of the page.

Originally PHP was a simple little CGI wrapper written in Perl, to avoid starting Perl each time to the server in the standard treatment of CGI and were used for small Internet pages. Later it became the tool to enable SQL in a Web page.

It was a CGI wrapper that analyzes SQL queries and makes it easier to create forms and tables based on these queries. PHP/FI Version 2.0 is a complete rewriting of these two packages combined into a single program.

This is a simple programming language embedded inside HTML files. PHP/FI is used more today to create the whole web-servers than for small home pages.

The module eliminates the need for numerous small cgi programs in Perl, allowing you to put a simple script programs directly in HTML files. Built-in support for various databases makes it trivially easy to develop web pages with access to databases.

Originally, PHP was an abbreviation of Personal Home Page but then the name was changed and now it means PHP: Hypertext Preprocessor (Preprocessor Hypertext PHP). PHP can be used as an effective module of the Apache server.

With the advent of new version of PHP can be installed in the form of an ISAPI module for internet information server of microsoft. Such advantages include:

- High performance
- The availability of interfaces to other database management systems
- Built-in program libraries to carry out many common tasks
- Related with network
- Inexpensive
- simple to study and use
- The availability of the source code

These benefits are described in more detail here in after.

Performance: PHP is extremely effective. Using a single inexpensive server, you can serve millions of hits per day.

Integration with databases: PHP has built-in connectivity with many database systems. In addition to MySQL, among others you can directly connect to PostgreSQL databases, mSQL, Oracle, dbm, Hyperware, Informix, InterBase and Sybase.

Using ODBC Open Database Connectivity Standard (Standard interface open database connectivity), you can connect to any database for which there is ODBC driver. This applies to microsoft products and many other companies.

Built-in libraries: As PHP was designed for web use, it hasmany built-in functions for performing many useful tasks related to the web. It can be used "on the fly" to generate GIF images, connect to other network services, send email and generate PDF documents.

Cost: Package PHP is free. The most recent version is available any time for free download from http://www.php.net.

Learning of PHP: The syntax of PHP is based on other programming languages, primarily in C and Perl. If the programmer is familiar to C, Perl or C- like language such as C++ or Java, he will be able to effectively use PHP.

Portability: Package PHP can be used under different operating systems. PHP code you can create in an environment free Unix like operating systems (Linux, FreeBSD), commercial Unix versions such as Solaris and IRIX and different Microsoft Windows versions. As a rule, the programs will work without any changes in different environments with installed PHP.

Source code: The user has access to the source code of PHP. In contrast to commercial closed software, if you want something to change or add in this language, it can always be done.

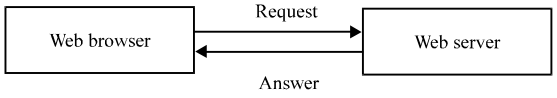

Fig. 1: Web server

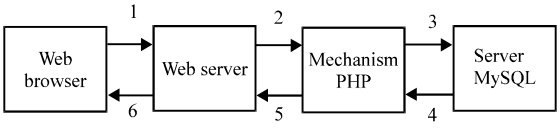

Fig. 2: Web browser

Architecture of web databases: The basic operation of the web server is illustrated in Fig. 1. This system consists of two objects: web browser and web server. There must be a communication channel between them.

A web browser sends a request to a server, the server sends back a response. For the server sending the normal static pages, this architecture is suitable. The architecture of the website which includes a database, more complicated.

The basic architecture of the web databases includes web-browser, web-server, scriptable mechanism and a database server (Fig. 2). A typical Web transaction database consists of six stages:

The web browser sends an HTTP request to a certain web page using an HTML form. The page with the search results is called results.php.

The web server accepts the request results.php gets the file and passes it to the PHP mechanism for processing.

The mechanism of the PHP begins analyzing the script. The script contains a command that connects to a database and query it. PHP opens a connection to the MySQL server and sends the necessary request.

The MySQL server receives the query to the database, processes it and then sends the search results back to the PHP mechanism.

The mechanism of the PHP finishes the script, formatting the query results as HTML and then sends the results in HTML format to the web server. Web server sends HTML to the browser through which the user views the search results.

This process usually does not depend on what scenario the mechanism and what is the database server used. Often the software of the web server mechanism the PHP and the database server are on one machine.

The database server can run on another machine. This is done for reasons of safety, increase in or separate the flow. From the point of view of the development, prospects of both alternatives are the same but in terms of performance, the second option may be preferable.

CONCLUSION

Web server is a software responsible for accepting browser requests, search of specified files and return their contents.

Web server a server that accepts HTTP requests from clients, typically web browsers and issuing them HTTP responses, usually together with an HTML page, image, file, media stream or other data. Now, available Web-servers for all major platforms, including various UNIX versions, Windows NT, Novell IntranetWare company (an optional component of NetWare 4.x), OS/2 Warp, Mac OS and even Windows 95. Web servers have become affordable for the masses.

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