

Design and Implementation of Enterprise-Level Network Disk in Power System

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Abstract. This system is an Enterprise-Level information sharing platform based on browser/server mode (B/S), page frame stand tools in hypertext preprocessor language package. It consists of the user management module, file management module, friend's management module, information management module and administrator module. The system can provide in LAN users to more quickly and more convenient to share pictures, file upload and download, and make them in the Internet which is not restricted by time and space. Through the implementation of the system, the information exchange between users is promoted, the user's free access is realized, the operation becomes simpler, the efficiency of information interaction between the employees of the enterprise is improved, and the work efficiency is improved.

1. Introduction

With the spread of the Internet, the interaction of information has been pushed to a high point. In the concept of information sharing [1], how to get information quickly and accurately becomes a key concern. A new generation of enterprise based on Internet (such as Google, Baidu, etc.), is just to seize the core of the problem, information sharing and retrieval service, and to the traditional IT companies such as Microsoft, and Sun Microsystems Systems launched a challenge [2].The development of the system is based on local area network (LAN) [3]network backup system model, build a small area, and in order to solve the modern office department for fast data transmission and communication between members and with the demand of large space capacity, for the purpose of implementation within 100 m Ethernet LAN upload speeds of up to 10 m/s upload speed, and large capacity of space and unlimited, can upload a larger format file; And set up internal access, let small departments within the department to have space in your team, internal better more convenient exchange without being not the researchers see this team; Superadministrators [4] have the authority to open, freeze, delete, modify junior accounts, message announcements, and so on. The system to provide the division between the internal staff more quickly, more convenient to share pictures, data upload and download,



to make them in the Internet is not restricted by time and space, as long as the user of the system data can be Shared to upload, download files, such as operation, easy to enter the space, interface is simple and clear; This also responds to the three features of visual preview, group management, and stable security of the Internet disk. Better to solve QQ group sharing, QQ net disk, kingsoft fast dish and 115 net disks, etc. Network disk to demand high bandwidth, upload space capacity is small; at the same time reduce the U dribbling with viruses and trojans transfection and its position in physical inconvenience, the emergence of the system can bring great convenience to department office members, enhancing the working efficiency of the office department members, which is the system the meaning of existence. This system mainly uses the ASP.NET [5] + MYSQL [6] technology to research network upload and download, through the database management network resources.

2. Requirements analysis

The basic task of requirements analysis is to answer "what must the system do?" [7], then, is to determine what functionality the system must implement to meet the user's needs. Specifically, we should make sure that the system must have before development system functionality and performance, required by the system running environment, and forecast system development prospects.

This system is a small network disk system [8] based on B/S [9] and runs on a LAN or Internet, which used in the low-demand resources and environment, the general computer or server both in hardware and software can satisfy the conditions. Users can access the network's system by accessing the Internet's computer.

The entire system has two operating user roles, the super administrator and the general user. The commonality of each role operation is to enter a different management page by entering the correct user name, password, and four color captcha. After the role is completed, the login status is dropped through a special exit.

General users only own some basic operation permissions, they can make a new directory or file and they can delete the existing directory or file. In addition, they can upload and download files, and they can set access rights; if the file is set to shared, then it will be showed in the system home page; if it's only visible to friends, then it's available to your friends only; if you put the file to your private space, others can't see it anymore. General users can add friends and delete friends. They can send message to their friends and they can receive message from their friends as well.

Super administrator has the user management authority (can add users, assign permissions to users, and also can delete a user or modify the information, user information, including passwords, etc.) except for permissions of general users. Super administrators log in user management system. They can make statistical analysis of data in the background, update and maintain the system. Besides, super administrators can publish news bulletins and establish friend links.

3. System design

The system consists of a system user function module and a super administrator module. The users of the system function modules have a user account, friends management, mail management, directory management, and file management, which are used to realize the basic functional requirements of the users, and provides a file storage space; This system also has a more flexible friend communication space, namely Settings allow the system to provide users with access to form a team, this team has no access to the internal documents, giving them anytime anywhere with friends share the happiness of documents and pictures; You can also set up Shared and unshared permissions. The system structure diagram is shown in Figure 1.

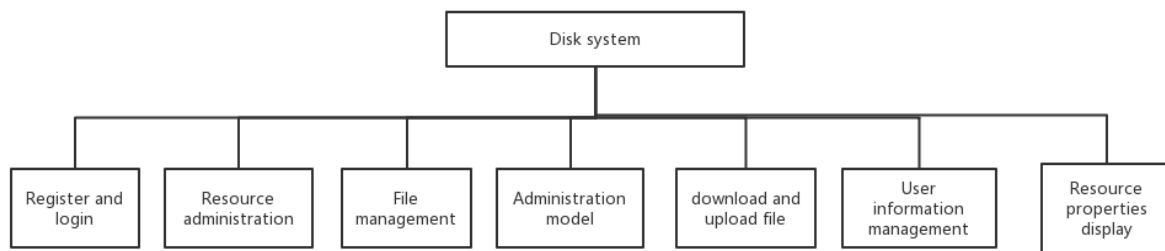


Figure. 1 Whole System Frame Diagram

For file upload, the browser is in the process of uploading the files submitted to the server in the form of streams, if use the servlet to obtain directly the inside of the upload file input stream and then parse request parameter is more troublesome, so generally choose the apache open source tools [10] common - fileupload this file upload component. The common - fileupload upload component's jar can be downloaded on the apache website and can be found under the struts lib folder, which is based on this implementation.

The function module of Friends Management is mainly realized with his best friend's query, add, management function, make the system of the team members can create their own work, it also meets the needs of the department office, the interior also has three small unit, implements the function can be better to solve the problems on access, let things not by others in this team can access to. Friend management allows users to add and delete their friends. Friend management allows users to add and delete their friends.

The upload sequence diagram as shown in the Figure 2, and the delete friends diagram is shown in the Figure 3.

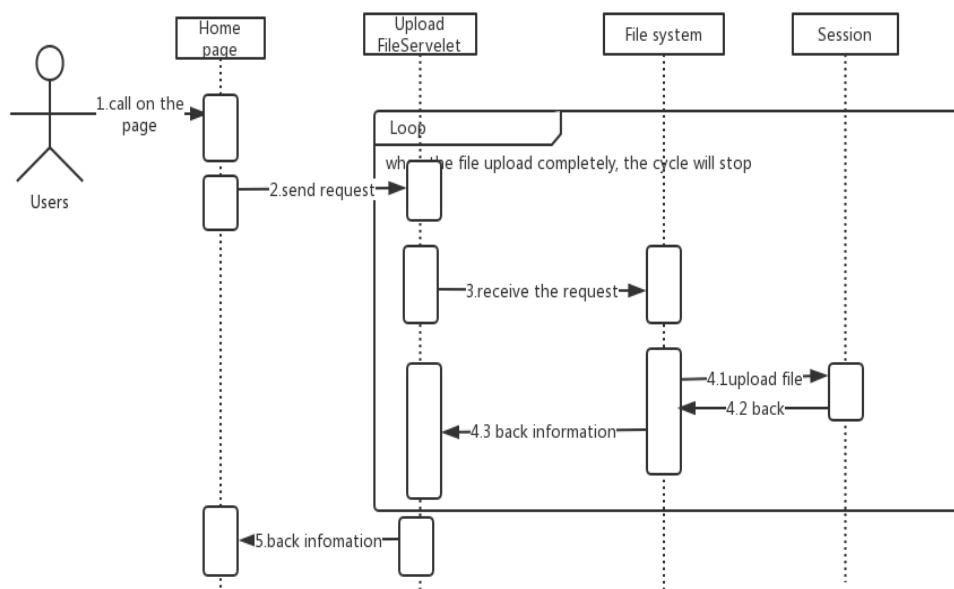


Figure. 2 Sequence Diagram Upload File

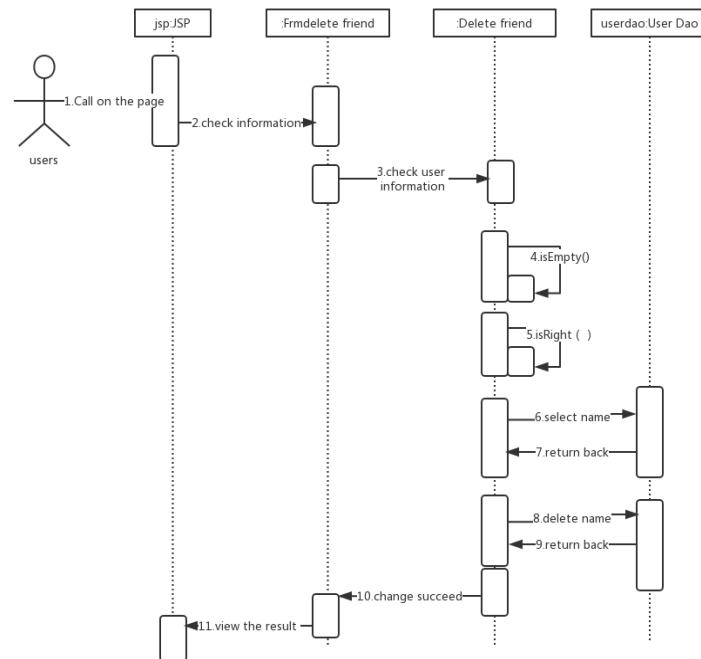


Figure. 3 Sequence Diagram Delete Friends

4. System implementation

4.1. Folder Creation and File Upload Function

Create and upload files from the folder system of the MySQL + PHP data sharing technology. The following is the basic principle of file uploading.

- 1) Iterating over all the files above;
- 2) To retrieve the current folder and folder names in filename;
- 3) The path to retrieve the user data store and the file path exists;
- 4) To determine whether the road is strong or not, if there is no such thing, the road will be created.
- 5) Save the data to the path created above, and the actual files are placed under the Upfile folder under the system.

Also, create folders and Settings for accessing folder permissions, which is Shared, visible and unshared by friends. The user can choose the file type by uploading the file to the folder. The file management page immediately displays the file information that the user has uploaded.

In PHP, the file upload function is implemented using the file functions provided by PHP.

But the reality may be slightly more complicated. For example, you can download the file if you need a user to fill out the complete registration information, and the first thing that comes to mind is using a Redirect. Where are two ways to do this using the Redirect. Check that the form is completed, and then refer to the file so that the user can download it. The download file data flow diagram is shown in Figure 4 below.

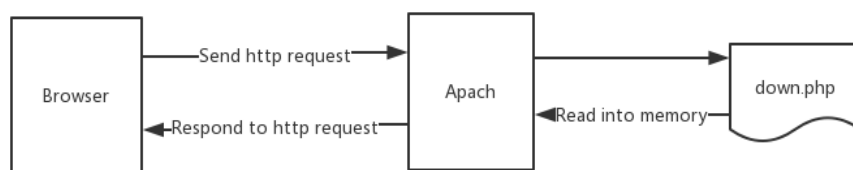


Figure. 4 Data Flow Diagram of Download File

4.2. Friend Management and Message Management

The function module is mainly realized with his best friend's query, add, management function, make the system of the team members can create their own work, it also meets the needs of the department office. The interior also has three small unit, implements the function can be better to solve the problems on access, let things not by others in this team can access to. Friend management allows users to add and delete their friends. The add friend page in Figure 5 in below.

The screenshot shows a web interface titled "My colleagues". At the top, there is a tip box that says "tip : You can add contacts, view their file shares, send messages, etc". Below this is a form labeled "add contacts:" with an input field and a green "submit" button. Underneath the form, there are two columns: "The contacts:" and "operations:". The "The contacts:" column lists five names: slm364364, llittong, zhangsan, 123458, and hoofei. The "operations:" column for each name contains two icons: "send message" and "add contact".

Figure. 5 Add Friend Page

Of course, we can delete the friend we have added. Define the addFri method and use this method to add friends. A friForm object is an encapsulation of the buddy information table object that is applied directly to the friend information table, which can be read and written to it. The message management page is set with message sending and message receiving, which will enable messages to be sent to friends and be received from friends without time and space limit. It makes full use of the rapidity of the local area network (LAN).

4.3. Folder Management

Folder management functions mainly manage the users of the folder, the administrator user all normal user permissions, also have manage user permissions, the administrator can in the function interface intuitive see user folder created various properties and built by the user by mulu. PHP file, and it also can undertake the delete operation.

4.4. System Classification Management

Administrators can add and delete various folders that are set up by the system; by class. PHP, class_del. PHP, class_edit. PHP file, three classes. The PHP file is created for classification catalogue (including top directories and subdirectories), class_del. PHP for classification of delete operations, class_edit. PHP file to edit operation. When the administrators create these categories, they are immediately displayed to the system's home page and user management page.

4.5. De-duplication

Dedupe (De-duplication) is currently heavily used in data backup and archiving systems because there is a large amount of redundant data that is well suited to this technique after multiple backups of the data. Dedupe technology can help many applications reduce data storage, save network bandwidth, improve storage efficiency, educe backup. The process of dedupe is: Firstly data file should be divided into a set of data, calculating the fingerprint for each block of data, then use Hash lookup based on

fingerprint keyword, matching indicates the data for the duplicate data blocks, only stores data block index number, otherwise it means the data block is the only piece of a new, storage of data block and create relevant meta information.

4.5.1. Sharing File Data: There are three main types of data segmentation algorithms, namely fixed-size partitions, the content-defined chunking and sliding blocks. The fixed-length block algorithm is used to cut the file with the predetermined block size and the weak check value and the md5 strength check value. Weak calibration value is mainly to enhance the performance of different coding, first calculate the weak calibration values and hash lookup, if found the strong calculate md5 check value and further hash lookup.

4.5.2. Calculate Data Fingerprint: Fingerprint data is the essential characteristics of data blocks, ideally each data block only has a unique fingerprint data, different fingerprint data blocks with different data. The data blocks they tend to be larger, so the goal of the data fingerprint is to expect smaller data representations (such as 16, 32, 64, and 128 bytes) to distinguish different blocks of data.

4.5.3. Retrieve Data: Hashtable is in memory, consumes a lot of memory resources, and requires reasonable planning for memory requirements before designing Dedupe. Depending on the length of the data block, the number of blocks (which can be estimated from storage capacity and average data block size), the amount of memory is estimated.

5. System test

Login page test, enter access address, normal jump is successful, otherwise login failed; User login test, only the mailbox and password are correct, can login, otherwise login fails; Administrator login test, only the mailbox and password are correct, can login, otherwise login fails; File upload test, only the file size less than or equal to 10 MB, and type is .doc/.wps,.mp3/.WMV,.avi/.mp4 / RMVB, file can be uploaded, otherwise fail; Change the password test, only the user correctly enters the old password, the new password that entered is consistent with the confirmation password, can complete the password change, otherwise fail; Users can log in and use the Internet, and the bugs they meet are solved in time. The administrator can check the user details and delete the existing user when logged in. In addition, the background logic of the program has been unit tested, and the problems found in the testing process have been modified.

6. Conclusion

This system uses JSP.NET technology to achieve the requirements for uploading and managing the online network system, uses MYSQL, which is highly portable and easy to use, satisfying the storage of the information of user and administrator, and files. In the system function, the design has completed the administrator for user account management, he networks disk storage file management; user registration, user login, upload file data, network file query and share. The whole system's interface is simple, easy to operate, the file upload speed is fast and so on.

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