Bachelor thesis

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Degree project
Net Disk System

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Title:

Net Disk System

Abstract:

With the continuous development of computer and network techniques as well as the extensive application of modern means of communications, computer plays an important role in the social life of modern society. It is always associated with a large number of files which are frequently used. Although new computer hardware products provided by various makers help people to solve the problem that have arisen in carrying files, people still face some difficulties in carrying storage devices. This project will partly realize the basic function of the net hard disk. The net hard disk is used to store the files of users on the internet, making it easy for users to carry files and share files with their friends. The uses are able to download, upload, copy, move and delete files and create a new file folder. They can also create, freeze, delete and alter their account. People can retrieve the file they want from the hard disk without anytime at anyplace.

Language:

English

Approved by:

_____

Fredrik Jonsson Date
Examiner

Directory

Chapter 1: Introduction

1.1 Background and history of Net disk

As we know, computer is more and more essential in our work and entertainment. With the rapid growth of information technology, the storage technology is also being more and more advanced. Net disk is a cloud storage, it is more and more widely used in the world because of its wonderful feature and advantages.

There are three different phases in the developing history of the net disk:

- Before 1990, there are few company provides the net disk product, but they only provides upload and download, and it is not free at that time.

- From 1990 to 2000, with the growth of information technology, the feature of the net disks become more and more powerful. A lot of company make the net disk as a shining point to attract the customers, typically the e-mail serve providers. They combine the on line storage and the e-mail service together and some of them are free.

- From 2000 to now, a lot of net disk provider appeared because of the cloud computing and storage. The feature and the speed of the net disk is becoming more and more powerful. For example, we can easily share the files with our friends nowadays.

1.2 Advantages

Simple comparison between Net Disk and other storage way.

Net disk VS USB flash disk

Every body want to own a network resource to convenience their work or study. In our daily life, people need to carry important files with them for communication. Of course they can store the important informations in their own hardware device: mp3, mp4, USB. But consider of the particularity of these hardware device, it will be easy to get hurt(especially the track and the section), what is worse, it is very usually to lost a device because their tiny size and light weight. This will cause a serious problem for the users. Further more, when some users want to share some resource for their woke mates or friends, the hardware device is obviously can not satisfy them. What is more, Net disk can be very safe, because the data you saved in the server database is encrypted and also provide better sharing experience. You can share the files with your friends very easily in anytime at everywhere.

1.3 Comparison between different Net Disks

	MyNetDisk	Microsoft(Folder share)	Windows Live(Sky Drive)	Drop box	Google Docs
Mainly face to	Private network	Public network	Public network	Public network	Public network
Need to download client	×	√	×	√	×
Communication online with the other users	Yes, in site mail, add friend(broadcast in site)	Share with friend	Shared in group	Invited users will give you extra space	It allows multiple user online collaboration on Microsoft Office compatible document formats such as Word, Excel, and PowerPoint.
Encryption	√	√	√	√	√
Limitation	Admin can set it by himself because it is for the private network	No limitation single 2GB	Single 25G file 50M	(Free forever) 2G	1 GB of storage is included for free. Currently additional storage costs per year are: 20 GB-$5, 80 GB-$20, etc. up to 16 TB
Special function	Hardware lock get the MAC and allow the specified account only in the specified computer	Remote access to shared files	using with the Windows Live Group you can send and share the files in group	MD5 comparison.if there is a same file that other users had already uploaded to the server, it will be uploaded very fast, in less then 1 sec.	Mobile access. Iphone and ipad can access to it

1.4 Aim and purpose

There are so many net disks now, but they are facing to the world wide net users, but we decided to make a product for the private Network users. Suppose that we are in a big company and A want to give B an important secret file. Then A must give the file to B by hand to make sure there is no "attack in the middle". But if the company uses the Net disk system, then A just need to upload the secret file to the local web and choose to only share to B. Then B can read and download the file in his computer. And because of the secure of the wireless network is weak, we decided to make a "hardware lock" in this net disk, that means, people can only log into the specific computer (their own computer maybe).

Chapter 2: Analysis and Design

2 .1 requirements analysis

We do the requirement analysis for the Net disk according to the below flowchart, then we got the detail function requirements.

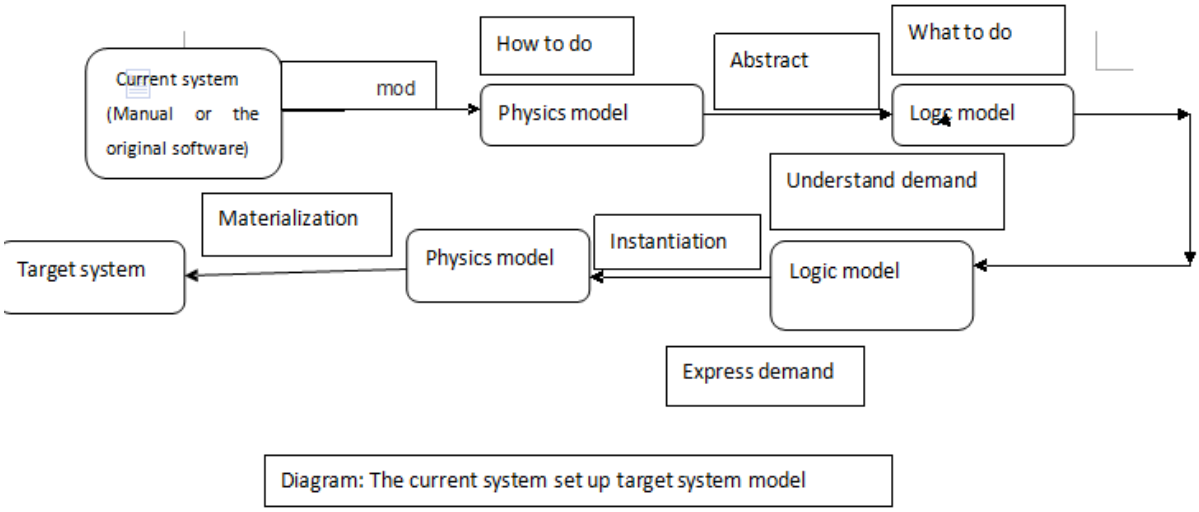


figure 2-1-1

2 .2 Function requirements

The network disk system provides a platform of file storage for the users, so they can upload and store their files in this system very conveniently.

- The main function of the user system:
  Users can understand the organization of the system function.
  Users can upload their own documents or pictures to the system.
  Users can create, share and check their directory of their uploaded files.
  Users can check the on line users and add them as friends, and mail them.
- The main requirements of the manage system:
  Administration can upload, modify, delete the uploaded documents or pictures.

2 .3 Design

2.3.1 User module design

- User register module: register including user name, password，QICQ, E-mail, sex, age, it will store the registered information in the users data sheet.
- User login module: when a user want to login the system, he need to register first, or he cannot login.
- User information: When a registered user login the system, the boards will show the users information.
- File upload module: Store the files in the specified place.
- Create directory: will create a directory.
- Check directory: Users can check the related information of the directory.
- Share directory: Set the file under the shared directory public and shared with the other users.
- User on line: Check the number and the name of on line users.
- My friends: Check the information of users friends.
- Site message: Can send and receive messages.
- Help: Get some help.
- Logout: Reverse back to the register page.

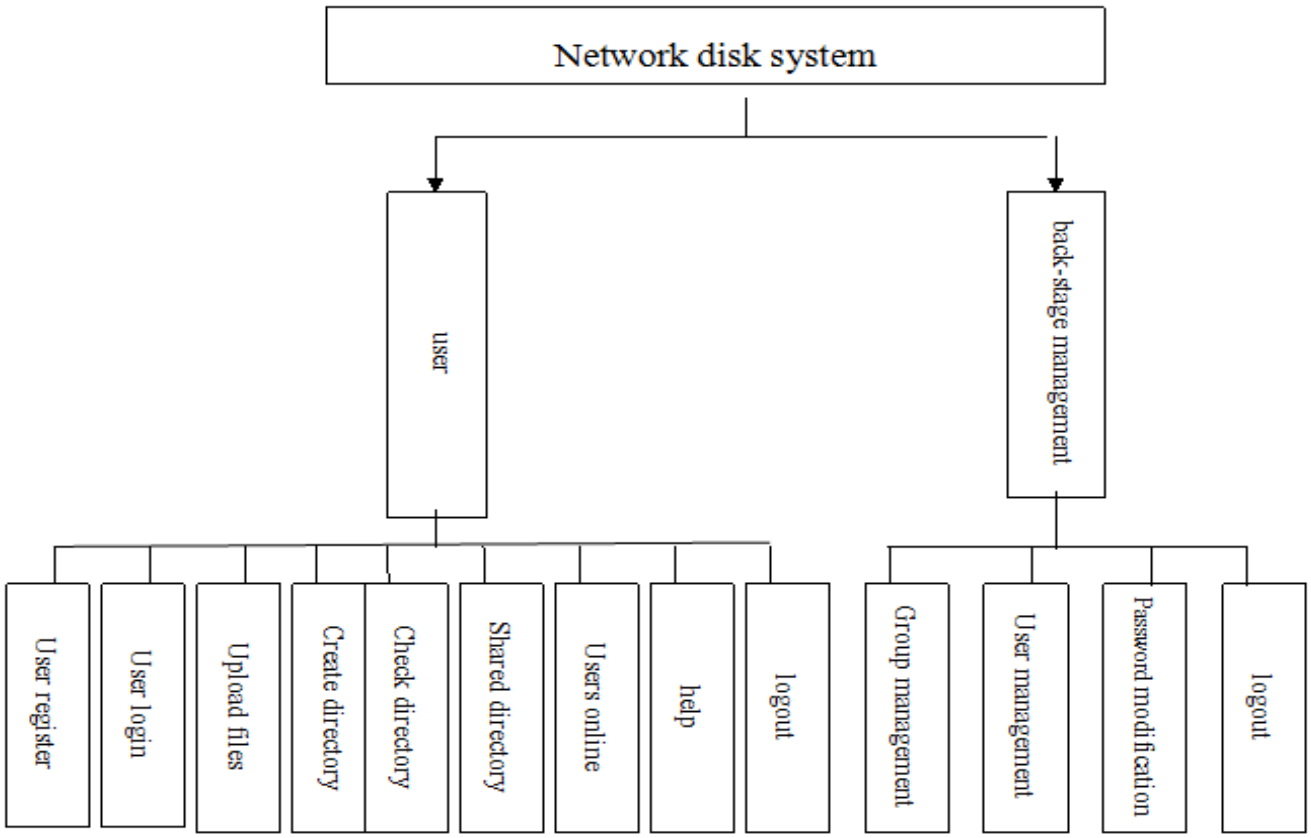
2.3.2 back-stage management system

The administration can manage the system in the following ways: the total number of the uploaded files, the total capacity, the user groups, the shared directory, the authority of the group, group ID, group name, the limit for uploading of the group, the size of single file of the group, the total capacity of the group, the allowed type for uploading of the group, the number for creating directory of the group, the watermark of the picture, the upload path.

2.3.3 Structure diagram of network disk system

The network disk system has 2 sub systems: user system and back-stage management system.

The figure 2-3-4 below shows the function module：



2.4 Database

The data is encrypted by MD5 and then save into the database. MD5 is Message-Digest Algorithm 5, invent by MIT computer science laboratory and RSA Data Security Inc in beginning of 90s.

MD5 is used for encryption and decryption technology widely. In our project, when users login, system calculates the input password to Md5 value, and then compare it with MD5 value which save in the databases, so in this way even the administration can not read the user password from the database.

When I build the database， I follow the basic rules:

1．Try to reduce the redundancy and the complexity

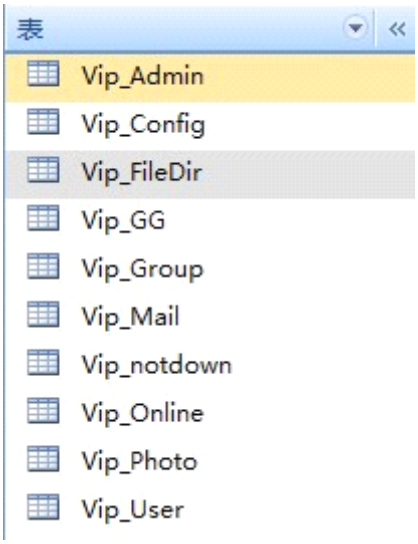
less redundancy and complexity，the database will be better.

2．Consider the Structure design and database design together.

As we know, the database provide data storage for the system and the system is based on the database. So when we design the database, we will add some redundancy data. It may make the database bigger but it will bring convenience to the programming.

3．Relative stability of data structure

According to the system function design and the divided function module. We list the following data and data structure：



- Name: user, figure 2-4-1

  user table contains ID, Username, Pwd, Sex, Age, Address and Mail.

Figure 2-4-1

name	Data type	primary key	Not null
ID	auto	Yes	Yes
Username	text	Yes	Yes
Pwd	text	No	Yes
Sex	text	No	Yes
Age	Number	No	Yes

Address	text	No	Yes
Mail	text	No	Yes

- Name: admin, figure 2-4-2

Figure 2-4-2

name	Filed name	Data type	Primary key	Not null
ID	ID	Auto	Yes	Yes
Usernsmr	Username	text	Yes	Yes
password	Pwd	text	No	Yes

- Name: vip-config, figure 2-4-3

Figure 2-4-3

Filed name	Data type	Not Null
ID	Auto	YES
Vip_name	Long text	YES

- Name: Vip_Filedir, figure 2-4-4

Figure 2-4-4

Filed name	Data type	Not Null
ID	number	YES
Userid	number	YES
Name	text	YES
Time	number	NO
share		NO

- Name: Vip_Photo, figure 2-4-5

Figure 2-4-5

Field name	Data type	Not null
ID	number	YES
Userid	number	YES
Filedir_id	number	YES
Size	number	NO
Share		NO

Chapter 3: Implementation of Net disk system

3.1 sub system main contain

User system:

1.system configuration module

User information configuration.

Administration information configuration.

2.database connector module

The main purpose of this module is to set communication to the database.

3.encryption module

The main purpose of this module is do the encryption for the users password.

4.Main board module

This module will build a board which is the main part for the web page. You can call different module in this main board for different pages.

- User information
- File upload
- Change info
- Create directory
- Check directory
- User online
- My friends
- Site message
- Shared directory
- Search users
- Help
- Levels
- Logout

5.register module

This module contain the functions for the new users.

6.login module

This module is program for the users to enter the system by fill in the right user name and password.

The 6 module up shows the main structure of the user system.

Back—stage management system

1.group management
This module is for the administration to manage the group settings.
2.user management
This module is for the administration to manage the users.
3.password configuration
This module is for the administration to manage the passwords.
4.log out

3.2 Register and login interface

http://localhost:2324/ Default.aspx
http://localhost:2324/reg.aspx

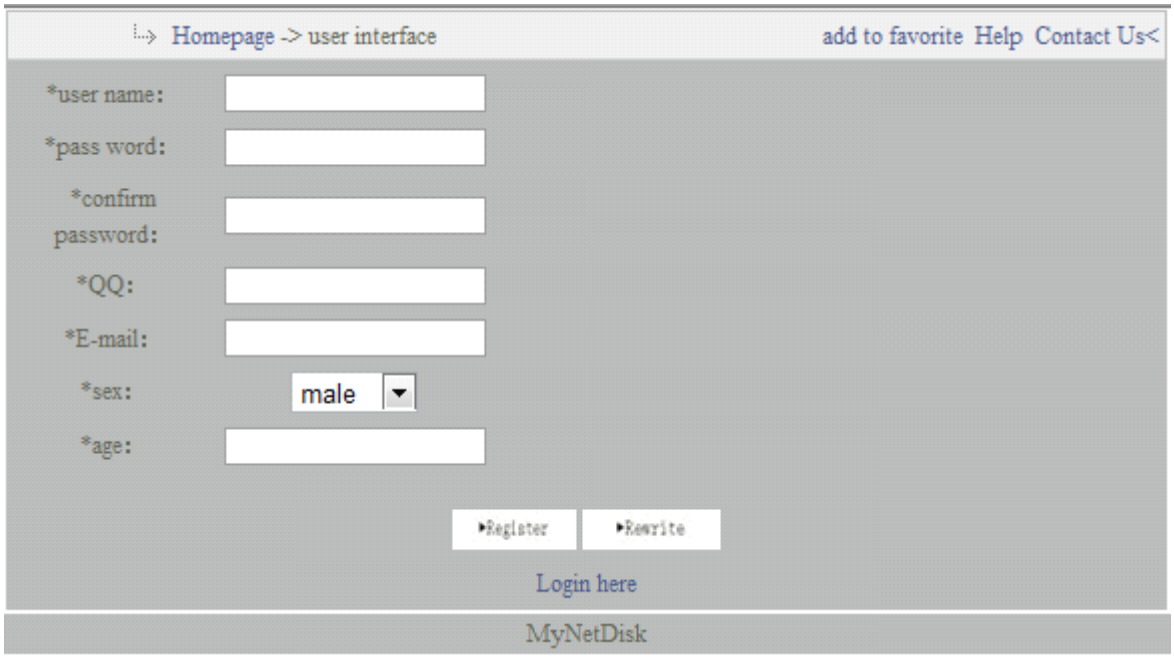
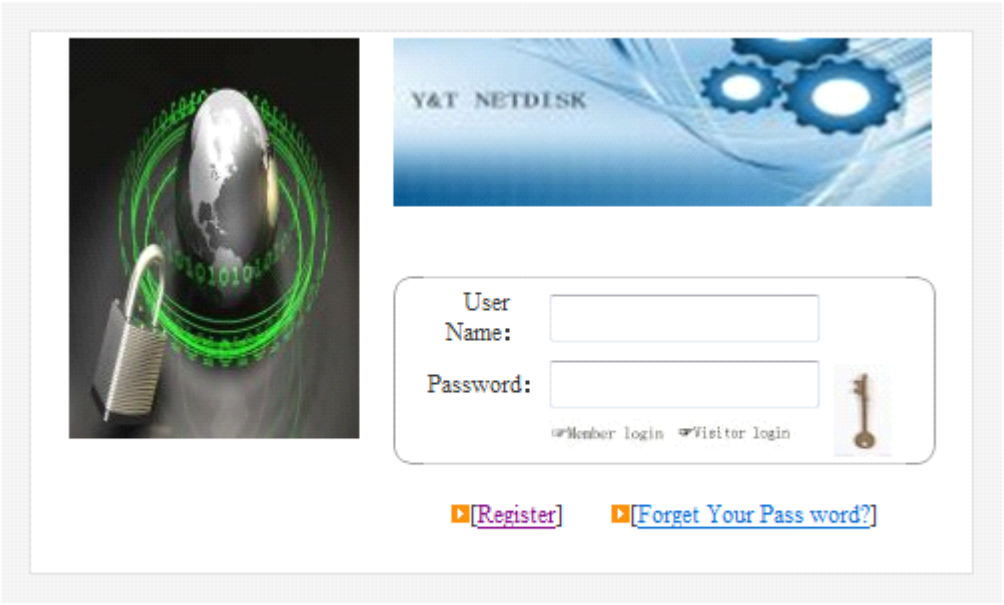


Diagram 4-1-1

User fill in basic information, click the button"Register", and then it will first check if the format is right or not, then it will read from the database if there is the user name is exit or not. Then if every thing is ok, it will create a new account, and at the same time it will insert the information into the database.
system "login" interface. Likes diagram 4-1-2.



MyNetDisk

Diagram 4-1-2

3.3 System main interface

User can enter main interface like diagram 4-2-1.
http://localhost:2324/Boards.aspx

MyNetDisk

Diagram 4-2-1

After enter the system main interface, through the left function prompt, you can do some corresponding operation. Likes diagram 4-2-2.
When you click the user information, it will link to listInfo.aspx.

```
<tr>
        <td height="12" align="center"><a href='listInfo.aspx' target=right>User information</a></td>
    </tr>
```

Diagram 4-2-2

3.4 Some function modules interface

3.4.1 File upload interface:

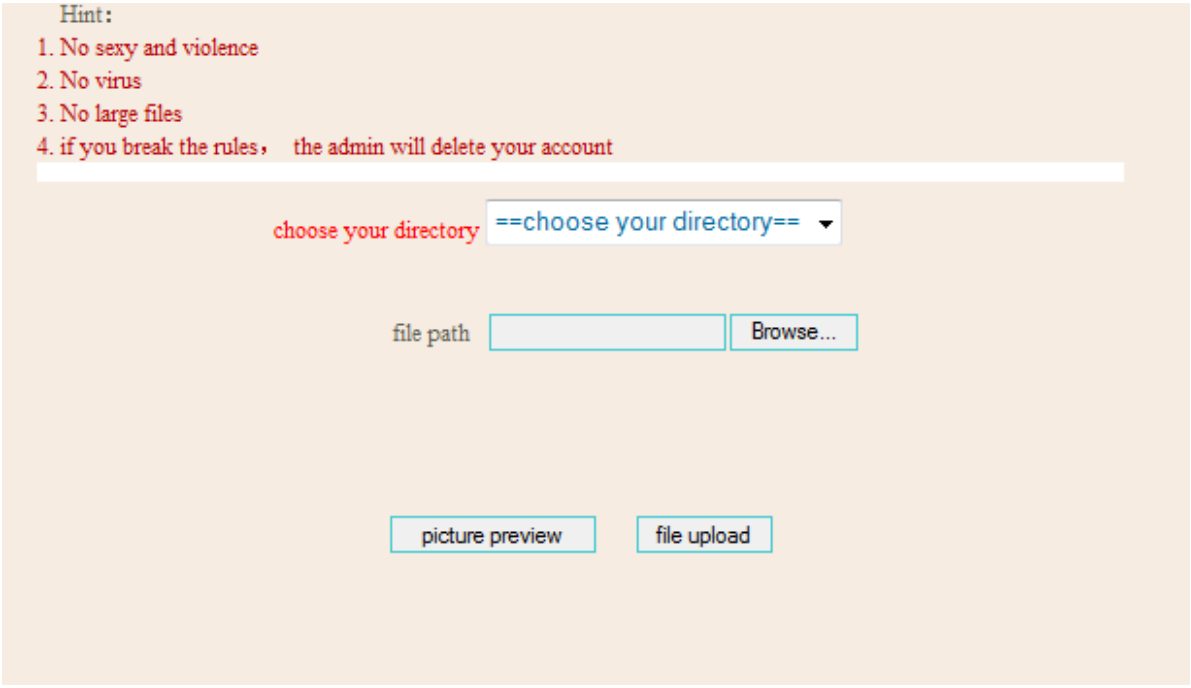
User need to create directories for keeping their different kind of files like 4-3-0

Diagram 4-3-0

After that you can browse your file and upload it to your directory.
Uploading method in add.aspx

```
protected void fileUpload_Click(object sender, EventArgs e)
private void processUpload(string fileDir,string fileDir_id)
```

See the diagram below 4-3-1



3.4.2 Site Message system:

User can send messages to friends. Likes diagram 4-3-2.

```
<tr>
            <td height="12" align="center"><a href='Mail/Mail.aspx' target=right>Site messages</a></td>
        </tr>
```

```
void send_Click(object sender, EventArgs e)
```

And mail file include:
Friend.aspx
Look.aspx
Mail.aspx
Message.aspx
Message_all.aspx

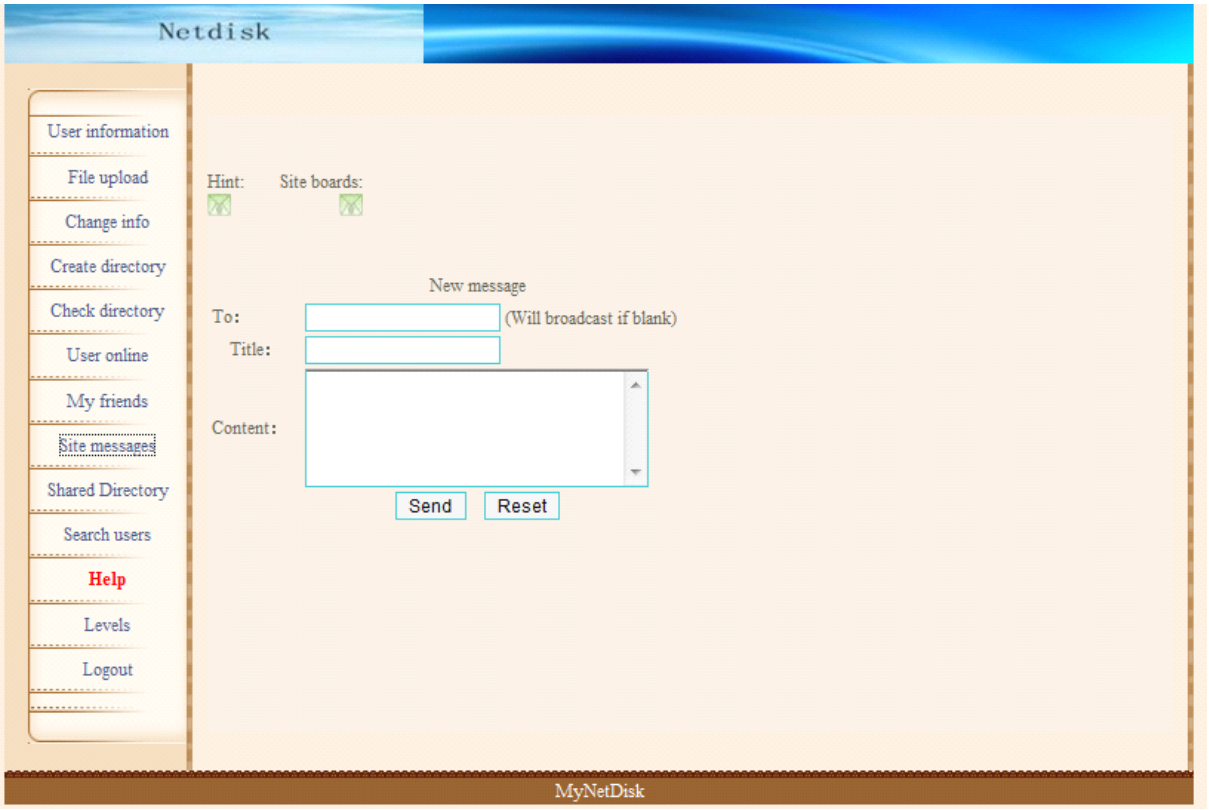
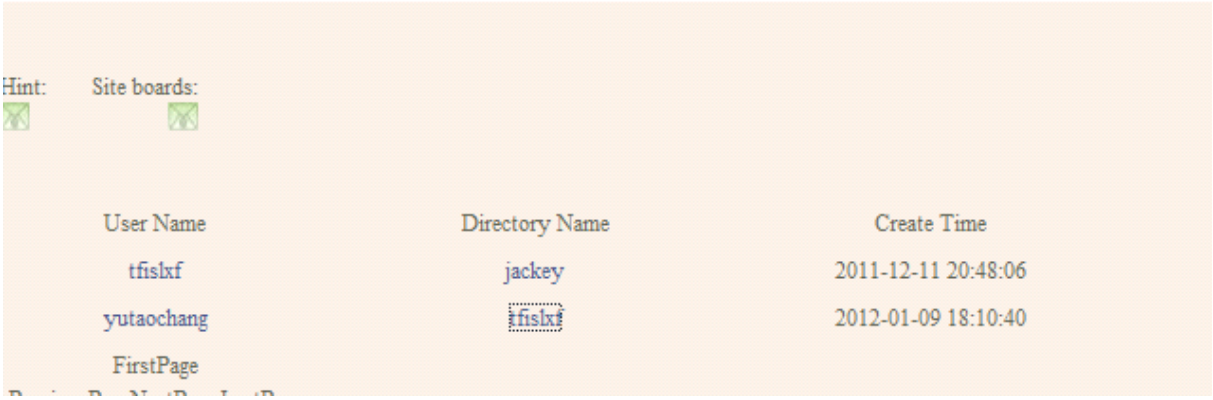


Diagram 4-3-2

3.4.3 Shared directory:

You can check the shared directory here.



3.5 back-stage management system

The back-stage management system is contain in the admin file in the source code, it includes:

- Admin.aspx

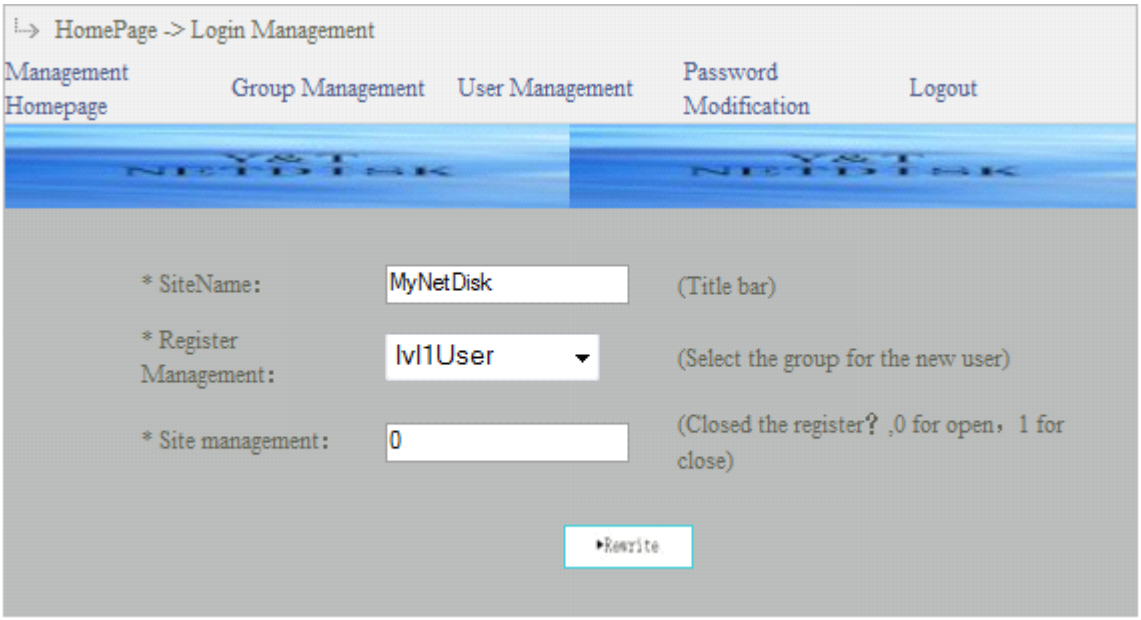
- Admindeluser.aspx
- Deldata.aspx
- Edituser.aspx
- Group.aspx
- Groupedit.aspx
- Passedit.aspx
- User.aspx
- User1.aspx

It contains 4 main part:

- Management homepage
- Group management
- User managment
- Password midification

3.5.1 management homepage

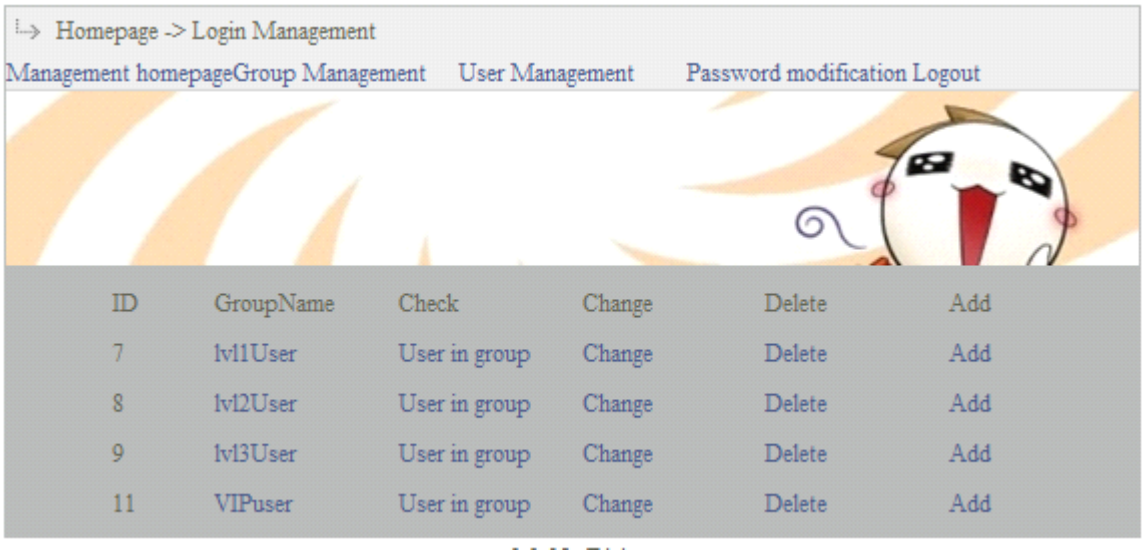
In management homepage, we can change the site name, the register level(if we set it as lvl2, then all the new users will be lvl2), also we can set for closing the register for the specific level. As in digram below.



MyNetDisk

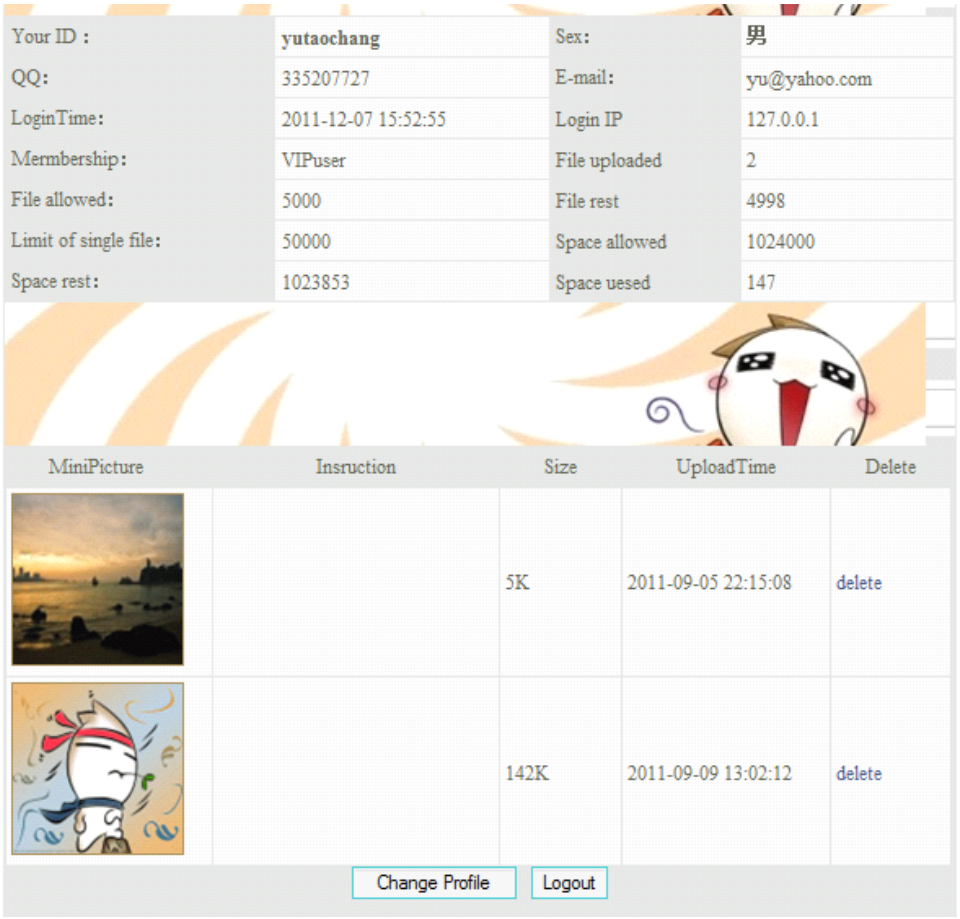
3.5.2 Group Management

Group management is used to manage the group properties. We can change and add group names and also can set the different limits for the specific groups.



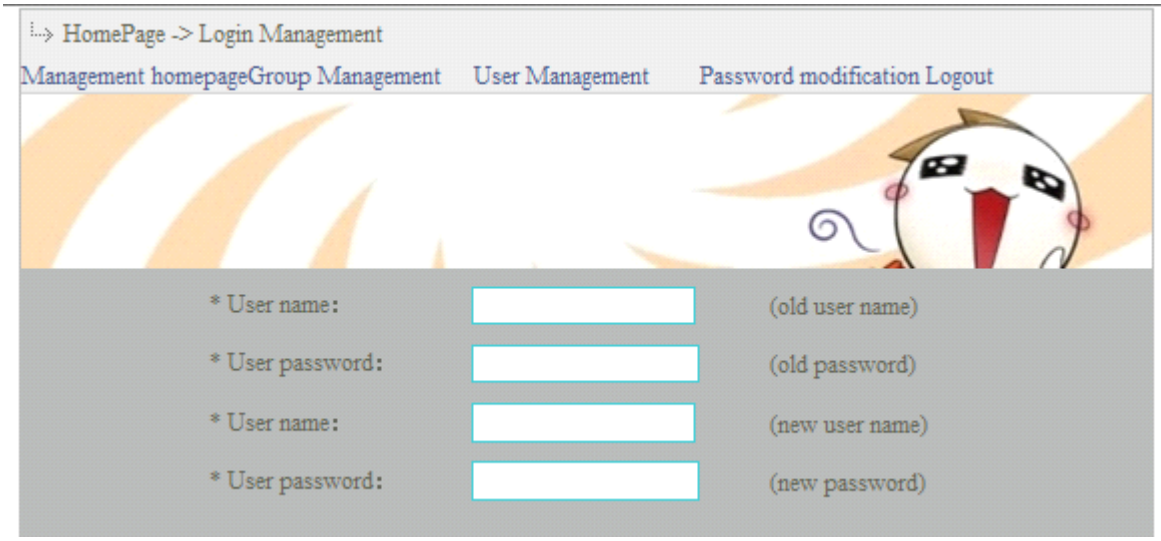
3.5.3 User management

User management is used for managing the user related data and settings, if the user upload some files which are not allowed. The admin may delete their account. And we can also see the detail profile of the user include the files they upload.



3.5.4 password modification

used to modify the ADMIN password



Chapter 4: System Testing

Testing and debugging is used to detected the problem may occur to the system and correct them.

4.1 Code testing

The testing is progress with the programming from the begining. It helps us reduce the probability of the problem, and also reduce the difficulty when we try to correct the code. We use different kind of data to test the system:

1．Testing with the correct data

Fill in the correct data in every place in the system where need to submit or transfer the data. For example, enter the correct user name and password to login.

2．Testing with unusual data

We also need to consider some critical data. For example, NULL character string.

These data are easy to be forgotten, and they are easy to make the system error. Testing help me to build a better exception handling system.

3．Testing with wrong data

Use the wrong data to test the system is testing the handling ability and the possibility for correcting the wrong data.

4.2 Function testing

Code testing proved the exactness of the logic, but it cannot test if the program is satisfy the defined function. So after code testing, we need to do function testing. We test the function in tow fields：

1．Module function testing

The whole system is combining with several modules, and each module contains several programs. I take all the programs out and test them by order， after tests and configuration，we realize the communications between different modules, and it runs well.（we done the above testing all by ourselves）

2．Customer testing

We invite some classmates to test our system also, we introduce the main function to them, and they use the system as a customer. They also give us a lot of feedback which is helpful and some nice recommendations. I fix some little problems in this stage：

When you have login to the system and enter in the main boards, you click back button, but it will not go back to the login page, we found that is because of the variable in the object session, so we fix it and solve the problem.

Chapter 5: Conclusion, Contribution and Future work

5.1 Conclusion

The users in the private network can create the directory and upload the files to the specific directory he want. And then he can modify the directories and the files. And share it to other users. You can check the shared directory and download the things which your friends shared to you. What is more, you can also add and search friend in the site, and message them.

During my work, I found it is really a big challenge to complete so many different modules. But anyway, we try our best to finish the job. It may be not that good compare with the existing net disks, but still we practise a lot and we got some interesting function in it. We found it is very useful to use module programming in the code developing, because we can test and modify different modules separately and that brings us a lot of convenience.

ASP.NET and Access technology are used in the project. Also java script is used for some function module.

5.2 Contribution

The degree project is creating a net disk for a private network.(Not allowed to login outside the company because of the MAC lock and the IP limitation.)
Here is the code for the MAC lock and the IP limitation:

```
<script language="javascript">
    <!--
document.write("<OBJECT id='locator' classid='CLSID:76A64158-CB41-11D1-8B02-00600806D9B6' VIEWASTEXT></OBJECT>");
        document.write("<OBJECT id=foo classid=CLSID:75718C9A-F029-11d1-A1AC-00C04FB6C223></OBJECT>");
        var MACAddr, IPAddr, sDNSName
        function getObject(objObject, objAsyncContext) {
            try {
                if (MACAddr == null && objObject.IPEnabled) {
                    if (objObject.MACAddress != null && objObject.MACAddress != "undefined")
                        MACAddr = objObject.MACAddress;
                    if (objObject.IPEnabled && objObject.IPAddress(0) != null && objObject.IPAddress(0) != "undefined")
                        IPAddr = objObject.IPAddress(0);
                    if (objObject.DNSHostName != null && objObject.DNSHostName != "undefined")
                        sDNSName = objObject.DNSHostName;
```

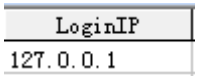
```
                }
            }
            catch (err)
            { }
        }
        function setValue(hResult, pErrorObject, pAsyncContext) {
            createTxt("txtMAC", MACAddr);
            createTxt("txtIp", IPAddr);
            createTxt("txtPCName", sDNSName);
        }

        function createTxt(txtName, txtValue) {
            var macTxt = document.createElement("INPUT");
            macTxt.name = txtName;
            macTxt.value = txtValue;
            macTxt.type = "hidden";
            try {
                document.forms[0].appendChild(macTxt);
            }
            catch (err) {
             }
        }
        document.getElementById("foo").attachEvent("OnObjectReady", getObject)
        document.getElementById("foo").attachEvent("OnCompleted", setValue);
        try {
            var service = locator.ConnectServer();
            var MACAddr;
            var IPAddr;
            var DomainAddr;
            var sDNSName;
            service.Security_.ImpersonationLevel = 3;
            service.InstancesOfAsync(foo, 'Win32_NetworkAdapterConfiguration');
        }
        catch (err) {
        }

    -->
</script>
```

It use java script technology and use activex control plug-in to read the MAC and IP and save them to the database. It makes the specific account can only login in the specific computer, and in this way we can make the system more secure.

MAC
00:53:45:00:00:



5.3 Future work

We decided to develop the time system in the Net Disk System in the future, to calculate the on line time for the users and according to the on line time, we can set up a experience/level system which (the more activity you are, the more experience you will get.) What is more, the distributed database is needed for the security of the system. For fault tolerate of the system, I am going to implement the resuming from the break point in the system to protect the files that users upload or download. In the future, my partner and I will continue the work and try our best to make a perfect enough net disk.

Chapter 6: Reference

Links:

[1]net disk background and history1
http://www.qiexing.com/post/316.html
[2]net disk background and history2
http://download.csdn.net/detail/ccp2007/2321979
[3]net disk background and history3
http://www.disk4.com/10/276.html
[4]google docs
http://en.wikipedia.org/wiki/Google_Docs
[5]sky drive
http://en.wikipedia.org/wiki/Skydrive
[6]drop box
http://en.wikipedia.org/wiki/Drop_Box
[7]ASP.NET advantages
http://tech.ddvip.com/2009-07/1248426597126244.html
[8]MAC lock
http://topic.csdn.net/u/20070812/17/03a7db6e-09c8-48c6-b189-2e3f4876be6d.html

Books:

(1) ASP.NET 3.5 unleashed. Stephen Walther. Mixed media product. 2007
(2) Beginning ASP.NET 3.5 in C# 2008 from novice to professional, second edition. Matthew MacDonald. Apress. 2010
(3) Fundamentals of software engineering. Carlo Ghezzi, Mehdi Jazayeri, Dino Mandrioli. Pearson Education. 2003
(4) Design patterns: Elements of reusable object-oriented software. Erich Gamma, Richard Helm, Ralph Johnson, John Vlissides. Pearson Education. 2007
(5) Creating database web application with PHP and ASP. Jeanine Meyer. Charles River

Media. 2003
(6) Programming ASP.NET 3.5. Jesse Liberty, Dan Hurwitz, Dan Maharry. O'Reilly Meia,Inc,USA. 2008
(7) HTML 4.0 made simple. P.K.McBride, Nat Mcbride. Made Simple. 2009
(8) Writing Research Papers. Houghton Miffin Company. Houghton Miffin Harcourt (HMH). 2003

Chapter 7: Acknowledgements

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Thank you!