Design and Implementation of E-mail Client Software Based on C

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***Abstract*-By e-mail, people can easily transfer text, images, video, audio, data files, etc. . The e-mail system client (Mailbox) is a similar to Microsoft Outlook Express and domestic Fox Mail e-mail client software, which follows the design and implementation of the Simple Mail Transfer Protocol (SMTP) and Post Office Protocol (POP3).This system in c# language implements the functions about outgoing and incoming emails, address book management by using the Microsoft Visual Studio2010 programming tools and SQL Server 2008 database. It carries out e-mail accounts management, contact management and real-time receiving mails. The system has been tested completely and basically reaches the demand asked primly, and meeting design requirements of simple and easy to use.**

Keywords-e-mail Client; POP3; SMTP; DataBase; C#

I. INTRODUCTION

Along with the network further development, E-mail already became the people to relate the communication the important method. Exchanging and transmitting information can be between the mailbox and the other an email system. A specific account will be used for receiver to receive message from the mailbox. The fundamental principle is set up the "E-mail system "on the telecommunications network which is actually a computer system. The hardware of the system is a high performance, large capacity, because memory medium of the mailbox is hard disk, Storage space can be divided into three parts, which can realize receiving, edit, and save the three parts function. This allows users to log into their accounts, where they can read or send text messages, switch or forward mails, archive and other various operations. Most functions of the system are from the software, greatly reduces the cost of system hardware .In the present life, it becomes very difficult for users not only to remember the entire password for the multiple email account, but also to login multiple mail. So we design the E-mail client which provides the same functions as Microsoft Outlook, including multiple e-mail accounts, contacts and address book management by using the Microsoft Visual Studio2010 programming tools and SQL Server 2008 database.

II INTRODUCTION OF THE KEY TECHNOLOGY

1) C# Language C#[1]: language is a kind of simple, modern, object-oriented, and type-safe programming language which is from Microsoft designed to derive from C and C++. C # syntax is characteristic of strong outstanding manifestation, easy to learn, and providing many powerful capabilities which greatly simplifies the complexity of C++; It supports generic methods and types, and thus provides a better type of security and performance; C # also provides iterators that allows implementers to define collections of iterative behavior custom client code is easy to use . Visual Studio includes Visual C #[2], it is through a full-featured code editor, project templates , designers, code wizards , powerful and easy-to- use debugger and other tools to achieve.

2) Database technology: The implementation of e-mail management capabilities is more complex, due to the services provided by the website is published , we must consider how to save temporary files and email attachments. After analysis, we adopt the following scheme; First read the messages from the storage to the local mail management server, then the message is analyzed various data stored in the database, while retaining the corresponding e-mail messages in a database file path; When the user is displayed only view files from a local server which will read out e-mail messages and bind to a DataGrid controls them. Database technology, is mainly used to ADO.NET technology. Including connecting to the database, read data from the database, writes to the database, delete data from the database, disconnect from the database, thereby improving the efficiency of the system. If you need to download the attachment, the system will look for mail file based on the file path to the mail, analyze and extract attachments stored in the temporary directory, delete immediately after download.

3) E-mail protocol: Realization of e-mail sending, receiving and other functions are relying on network equipment and network e-mail protocols. The most important of several protocols are SMTP[3](Simple Mail Transfer Protocol), POP3 and IMAP (Internet Mail Access Protocol). Which SMTP protocol is used for sending e-mail, POP3 and IMAP can be used to access and retrieve your e-mail. The system adopts POP3 (Post Office Protocol) protocol, namely mail protocol .When receive e-mail, the client first carries out to resolve the IP address of the POP3 server to a name by calling the DNS (Domain Name System) protocol, when parse out the IP address, the mail program will start using the TCP protocol to connect to the mail server port 110 .After successfully connecting to the POP server, firstly, the mail account will be back to the server. Secondly, upon completion of this certification, the mail program requests the server to return the mailbox statistics, such as total number of messages and message size. Then lists the number of messages, the program will receive mail.

III SYSTEM DESIGN AND IMPLEMENTATION

1) System Functional Overview: Mail management system supports user management, e-mail management and other functions, since e-mail is on the network, and the vast majority of cases is through the browser, so the system adopts the B/S construction[5]. The overall function of the system can be divided into four categories: receive mail, send messages, and manage e-mail and management of users.

a) Receive mail: Everyday at a certain time or real-time, Unified collection on multiple external mail servers on multiple new email accounts and then summary together, Filtering e-mail according to the sending address and filtering rules, and extract e-mails on the server effectively, The essential information of the e-mail is stored in the database by manual intervention or automated mechanism, attachment can be stored in the file server, then keep one duplicate e-mail by comparison.

b) Send e-mail: Send relevant emails.

c) Managing mail: the email system can provide users with the function of email retrieve, deletion, adjust and the classification. Ordinary users can only manage with their work-related email; system administrators can manage all mail

d) Manage user: administrator can complete the following operations such as adding and deleting users, modify personal information.

We need to send e-mail via the SMTP protocol , receiving mail via POP protocol. Through the analysis of system's specific requirements, system function module chart is shown in Fig. 1.

2) Introduction about Specific Code: Code The requirement and function of the system are analyzed, and the Design scheme of the system is brought forward[4]. We need to implement the function of the system, This E-mail client quotes Dimac 's Jmail mail transceiver module pro version 4.4 . W3 JMail mail component is developed by Dimac company, This component was originally developed for sending e-mail , reception , encryption and cluster transmission. This component is a free component that is suitable for our program. This article completes the design and realization of main function, such as mail landing server, mail operations and log out.

a) Login mail server: According to the design requirements, we can receive all the mail when we log on to the server using the mailbox. We mainly use Jmail component POP3Class object classes to receive mail. Use Jail Message class to store the received email. If the message contains an attachment, through the attachment class to receive. Some information such as pop3 address, SMTP address, user name and password can be get through the database in connection to the server process, part of the codes is shown in Fig. 2.

b) Logout mail server: After this mailbox operation is complete, you need to destroy POP3 Client components and dispose of the resources. The.net, unlike JAVA, there is no automatic function of GC; Procedures must require manual recovery of resources. Log out part of the code is shown in Fig. 3

c) Mail operating: Mail operations part of the code is shown in Fig. 4:

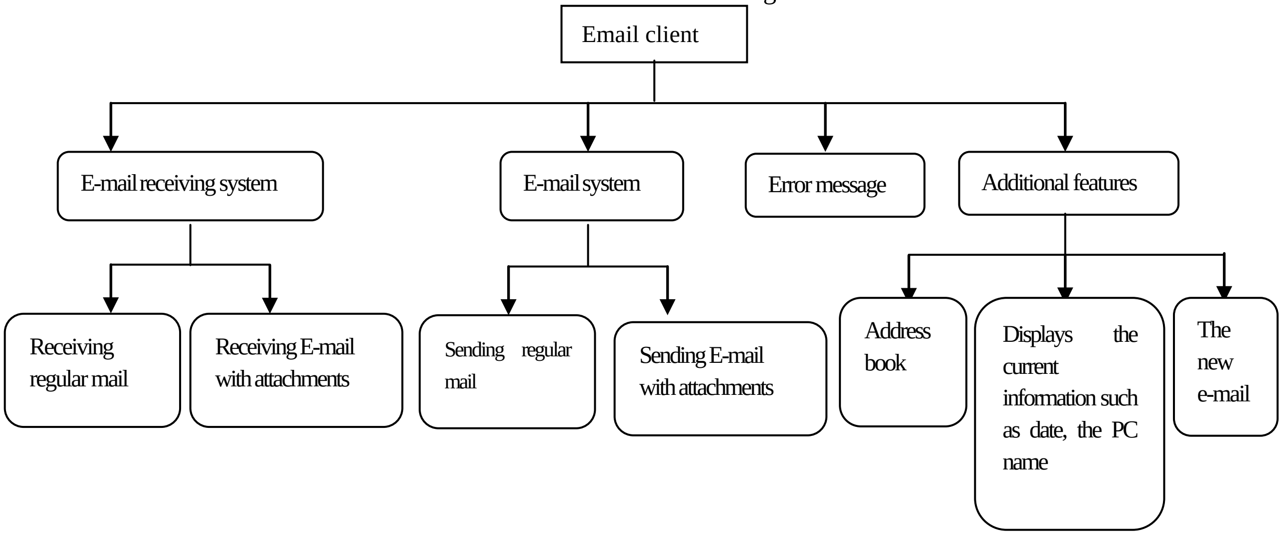
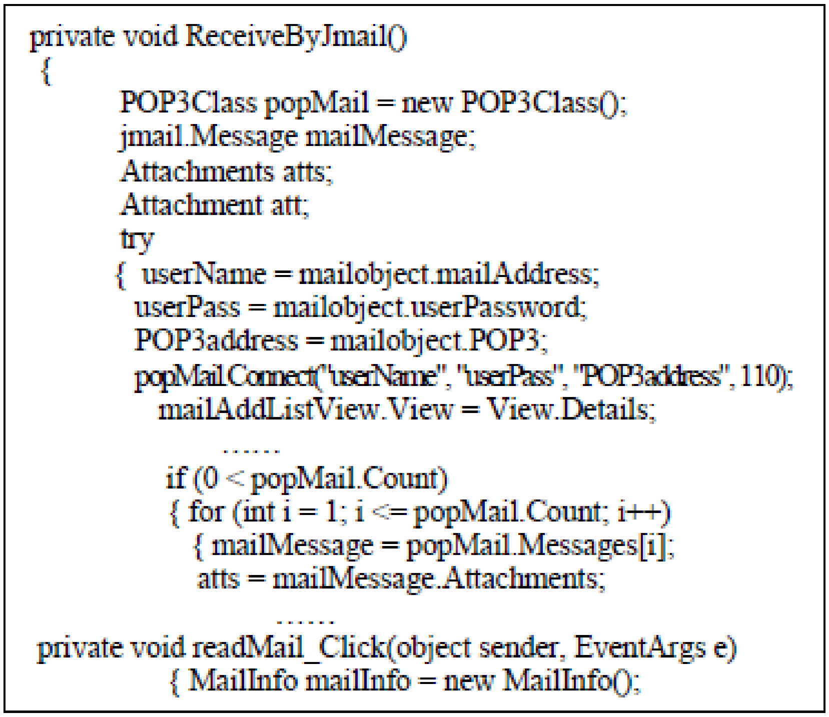
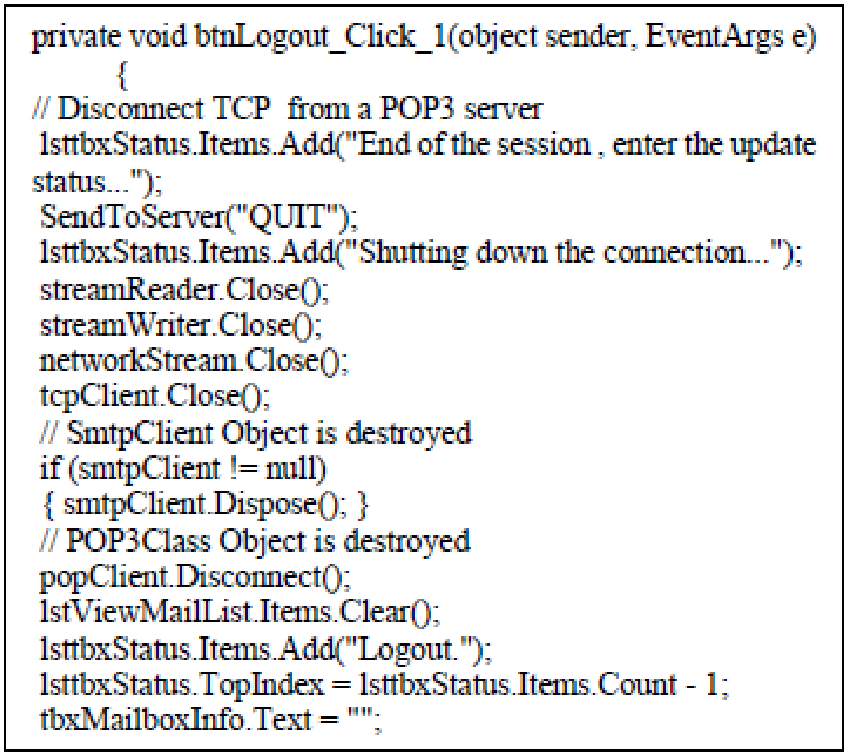


Figure 1. Functional module chart of the system.



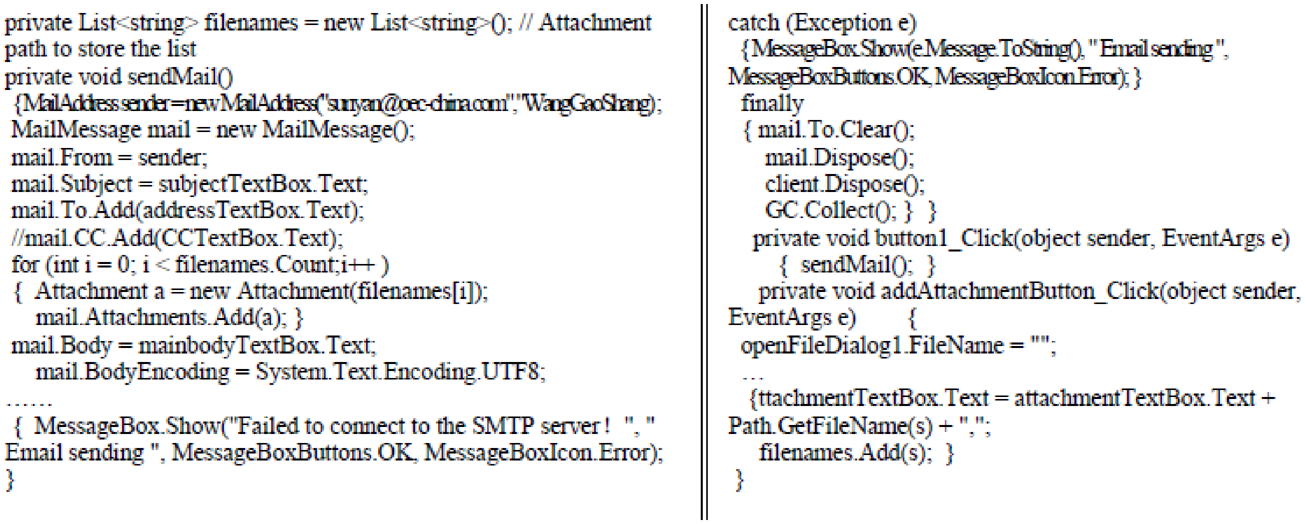
```
private void ReceiveByJmail()
 {
          POP3Class popMail = new POP3Class();
          jmail.Message mailMessage;
          Attachments atts;
          Attachment att;
          try
          {  userName = mailobject.mailAddress;
            userPass = mailobject.userPassword;
            POP3address = mailobject.POP3;
            popMail.Connect("userName", "userPass", "POP3address", 110);
               mailAddListView.View = View.Details;
                       ……
                if (0 < popMail.Count)
                { for (int i = 1; i <= popMail.Count; i++)
                   { mailMessage = popMail.Messages[i];
                    atts = mailMessage.Attachments;
                            ……
 private void readMail_Click(object sender, EventArgs e)
                { MailInfo mailInfo = new MailInfo();
```

Figure 2.   Login mail server code



```
private void btnLogout_Click_1(object sender, EventArgs e)
          {
// Disconnect TCP  from a POP3 server
 1sttbxStatus.Items.Add("End of the session , enter the update
status...");
 SendToServer("QUIT");
 1sttbxStatus.Items.Add("Shutting down the connection...");
 streamReader.Close();
 streamWriter.Close();
 networkStream.Close();
 tcpClient.Close();
 // SmtpClient Object is destroyed
 if (smtpClient != null)
 { smtpClient.Dispose(); }
 // POP3Class Object is destroyed
 popClient.Disconnect();
 1stViewMailList.Items.Clear();
 1sttbxStatus.Items.Add("Logout.");
 1sttbxStatus.TopIndex = 1sttbxStatus.Items.Count - 1;
 tbxMailboxInfo.Text = "";
```

Figure 3.   Logout mail server code



```
private List<string> filenames = new List<string>(); // Attachment
path to store the list
private void sendMail()
 {MailAddress sender=newMailAddress("sunyan@cec-china.com","WangGaoShang");
 MailMessage mail = new MailMessage();
 mail.From = sender;
 mail.Subject = subjectTextBox.Text;
 mail.To.Add(addressTextBox.Text);
 //mail.CC.Add(CCTextBox.Text);
 for (int i = 0; i < filenames.Count;i++ )
 {  Attachment a = new Attachment(filenames[i]);
    mail.Attachments.Add(a); }
 mail.Body = mainbodyTextBox.Text;
    mail.BodyEncoding = System.Text.Encoding.UTF8;
……
 {  MessageBox.Show("Failed to connect to the SMTP server！  ", "
Email sending ", MessageBoxButtons.OK, MessageBoxIcon.Error);
}
```

```
catch (Exception e)
  {MessageBox.Show(e.Message.ToString(), "Email sending ",
MessageBoxButtons.OK, MessageBoxIcon.Error); }
  finally
  { mail.To.Clear();
     mail.Dispose();
     client.Dispose();
     GC.Collect(); }  }
    private void button1_Click(object sender, EventArgs e)
       {  sendMail();  }
     private void addAttachmentButton_Click(object sender,
EventArgs e)        {
  openFileDialog1.FileName = "";
  …
   {ttachmentTextBox.Text = attachmentTextBox.Text +
Path.GetFileName(s) + ",";
     filenames.Add(s);  }
 }
```

Figure 4. Mail Operating

IV SYSTEM TESTING

The software testing is an essential part of the software development process. System testing mainly in two ways: static testing and dynamic testing, we mainly adopt dynamic testing. The purpose of system testing is to find the system as much as possible the existence of deficiencies and BUG, timely correction of errors in order to ensure the normal operation of the system can work. The main function of the test process and operation is given in the form of figure because of the testing process is more cumbersome.

First enter the main interface, as shown in Fig. 5. At this point, a test mailbox has been preset. For confidentiality reasons, QQ mailbox is blocked. For the same reason the rest are handled this way, and not repeat them.

To add a new mailbox, click the menubar from above in the “mailbox operation " drop-down menu will pop up , as shown in Figure 6 . Click on the "Add a new mailbox” button; it will jump to the following page. As shown in Figure 7, the information has been entered to be dded.

After you click on the "Confirm Add" button, the add information are stored in the database. After the addition is complete, it will return to the main interface. As shown in Fig.8, If we want to choose a mailbox, click below to enter the specified mailbox, The system will pop up a mailbox user interface. We can double-click mail to read information, as shown in figure 9.

If we need to write a new message or reply to an email, we can click on the button below. Enter the interface about reply and send the new E-mail is the same, the difference is that a click reply, the system will automatically fill in the recipient email address. We can choose to add email addresses from the address book, and added email address will be displayed in the box to the recipient. We landed after sending the recipient's mailbox and found that the recipient mailbox has been successfully received the message, at this point the main function of a simple test has been completed.

V CONCLUSION

After system testing, we revised some problems found in the testing process, and improved some unreasonable places. The problems’ existing in the application in some local reflect not to come out but is likely to be exposed in the global, which influence the realization of function. Through testing, and after the modification, the result shows that the test system reached the aim of the design, such as easy to use, convenient design goals. The main function of e-mail, address book, etc. have been fully realized, and it can be delivered to the users to use.

REFERENCES

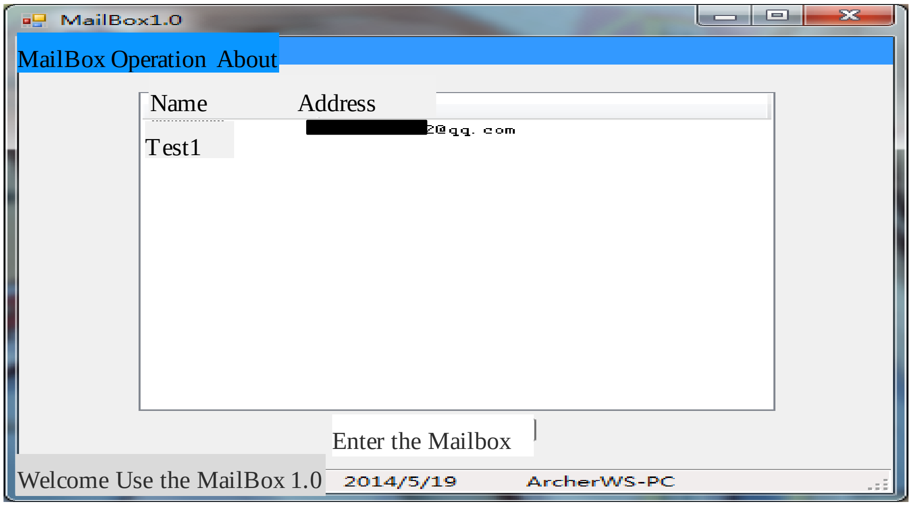
[1] Chen Jianxiao. 2006.C# Network and communication program design case succinctly[M]. Beijing：Tsinghua University Press,90-149.

[2] Zhoufeng. Visual 2007.C#.NET2005 Chinese version of the basic and practical tutorial[M]. Beijing：Electronic Industry press.

[3] Peng Lingpeng.2008, SMTP Protocol [Z]. http://blog.csdn.net/bripengandre/article/details/2191048 Computer engineering and application

[4] Han Jingxia.2006.POP3 POP3 email client and the server's design and implementation [D] Dalian University of Technology.

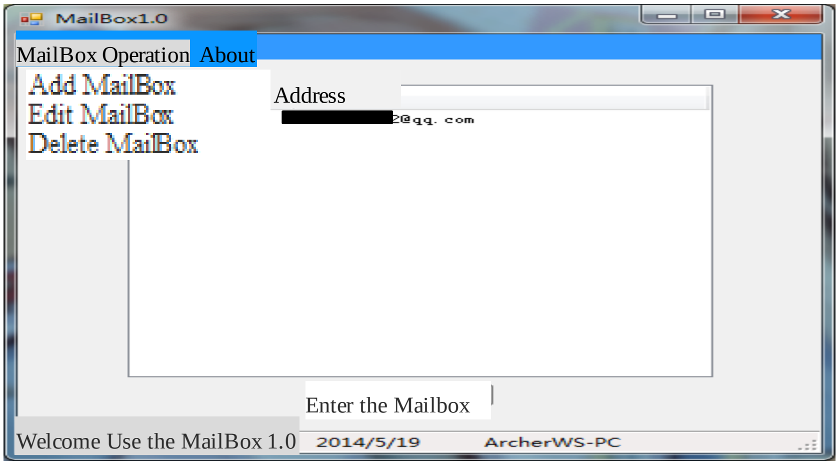
[5] ZhnangHua.2009. Mail charge function design about POP3 email server and the client[J]Journal of Weifang University (04) .



Name	Address
Test1	[redacted]2@qq. com

Welcome Use the MailBox 1.0 2014/5/19 ArcherWS-PC

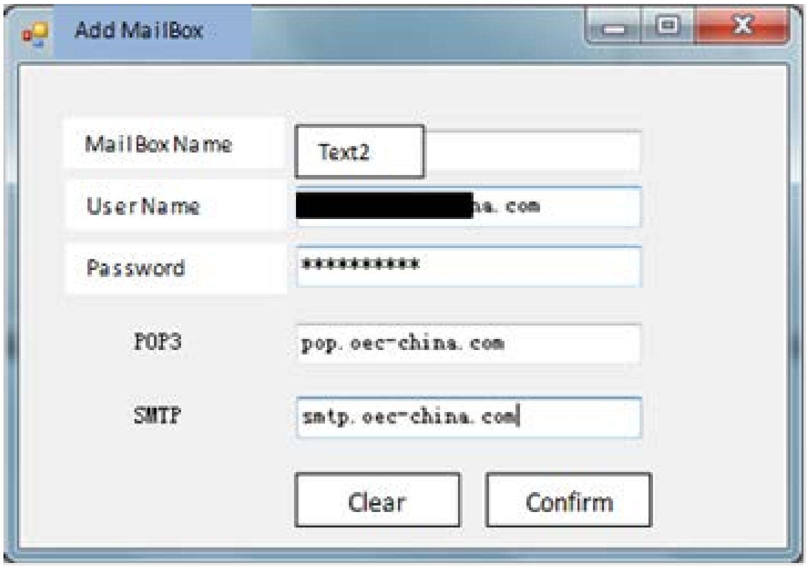
Figure.5. Main interface



Address
[redacted]2@qq. com

Welcome Use the MailBox 1.0 2014/5/19 ArcherWS-PC

Figure 6. Main interface- add a new mailbox



MailBox Name: Text2

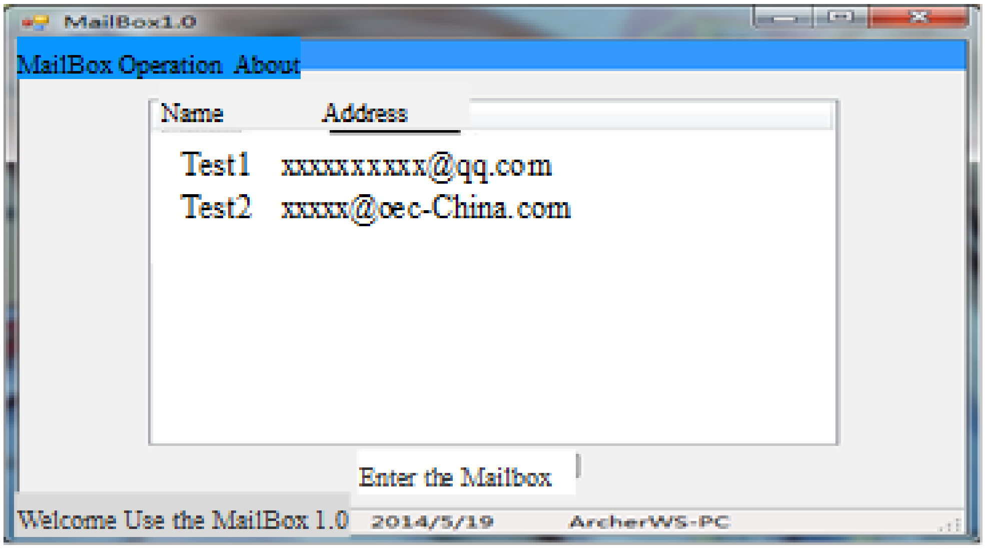
UserName: [redacted]a. com

Password: ***********

POP3: pop. oec-china. com

SMTP: smtp. oec-china. com

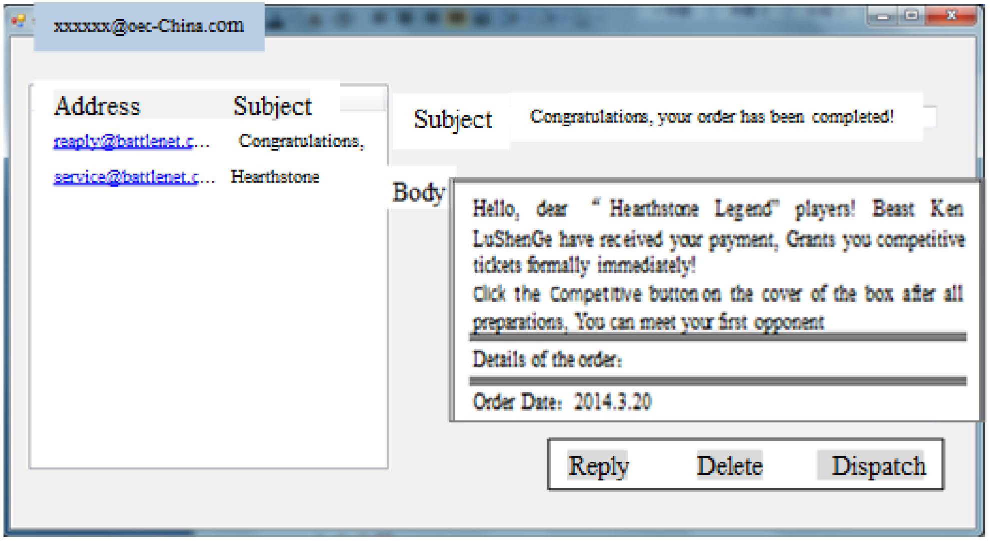
Figure 7. The interface about adding a new mail



Name	Address
Test1	xxxxxxxxxx@qq.com
Test2	xxxxx@oec-China.com

Welcome Use the MailBox 1.0 2014/5/19 ArcherWS-PC

Figure.8. The main interface after adding a new mailbox



xxxxxx@oec-China.com

Address	Subject
reaply@battlenet.c…	Congratulations,
service@battlenet.c…	Hearthstone

Subject Congratulations, your order has been completed!

Body Hello, dear " Hearthstone Legend" players! Beast Ken LuShenGe have received your payment, Grants you competitive tickets formally immediately!

Click the Competitive button on the cover of the box after all preparations, You can meet your first opponent

Details of the order:

Order Date: 2014.3.20

Figure 9. Interface to Receive Email