

# WireShark实验 - 套接字编程作业 2: SMTP

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完整的SMTP邮件客户端的代码:

```
1  from socket import *
2  import base64
3
4  msg = "I love computer networks!"
5  endmsg = "\r\n.\r\n"
6
7  # Choose a mail server
8  mailserver = "smtp.163.com"
9
10 # Create socket called clientSocket and establish a TCP connection with
    mailserver
11 # Fill in start
12 clientSocket = socket(AF_INET, SOCK_STREAM)
13 clientSocket.connect((mailserver, 25))
14 # Fill in end
15
16 recv = clientSocket.recv(1024).decode()
17 print(recv)
18 if recv[:3] != '220':
19     print('220 reply not received from server.')
20
21 # Send HELO command and print server response.
22 heloCommand = 'HELO Alice\r\n'
23 clientSocket.send(heloCommand.encode())
24 recv1 = clientSocket.recv(1024).decode()
25 print(recv1)
26 if recv1[:3] != '250':
27     print('250 reply not received from server.')
28
29 # send AUTH LOGIN command
30 # Fill in start
31 LoginCommand = 'AUTH LOGIN\r\n'
32 clientSocket.send(LoginCommand.encode())
33 recv2 = clientSocket.recv(1024).decode()
34 print(recv2)
35 if recv2[:3] != '334':
36     print('Login failed!')
37
38 clientSocket.send(base64.b64encode('18816576169'.encode()) + b'\r\n')
39 recv3 = clientSocket.recv(1024).decode()
40 print(recv3)
41 if recv3[:3] != '334':
42     print('Wrong ID! Please check your input.')
```

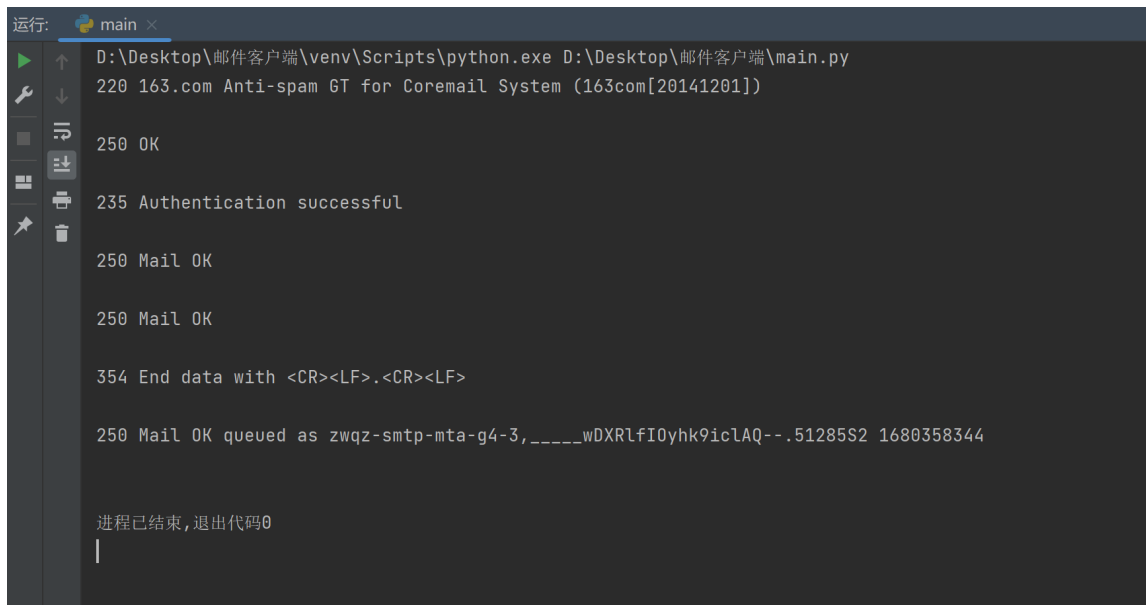
```
43
44 clientSocket.send(base64.b64encode('UKMGZMWAFBKWUFAH'.encode()) + b'\r\n')
45 recv4 = clientSocket.recv(1024).decode()
46 print(recv4)
47 if recv4[:3] != '235':
48     print('Wrong password! Please try again.')
49 # Fill in end
50
51 # Send MAIL FROM command and print server response.
52 # Fill in start
53 send_mail_addr = '18816576169@163.com'
54 MailFromCommand = 'MAIL FROM: <' + send_mail_addr + '>\r\n'
55 clientSocket.send(MailFromCommand.encode())
56 recv5 = clientSocket.recv(1024).decode()
57 print(recv5)
58 if recv5[:3] != '250':
59     print('Something wrong with MAIL FROM server.')
60 # Fill in end
61
62 # Send RCPT TO command and print server response.
63 # Fill in start
64 rec_mail_addr = '3182443151@qq.com'
65 RcptToCommand = 'RCPT TO: <' + rec_mail_addr + '>\r\n'
66 clientSocket.send(RcptToCommand.encode())
67 recv6 = clientSocket.recv(1024).decode()
68 print(recv6)
69 if recv6[:3] != '250':
70     print('Something wrong with RCPT TO server.')
71 # Fill in end
72
73 # Send DATA command and print server response.
74 # Fill in start
75 DataCommand = 'DATA\r\n'
76 clientSocket.send(DataCommand.encode())
77 recv7 = clientSocket.recv(1024).decode()
78 print(recv7)
79 if recv7[:3] != '354':
80     print('Something wrong with data_send_begin.')
81 # Fill in end
82
83 # Send message data.
84 # Fill in start
85 subject = 'I love computer networks!'
86 mailmsg = 'From: ' + send_mail_addr + '\r\n'
87 mailmsg += 'To: ' + rec_mail_addr + '\r\n'
88 mailmsg += 'Subject: ' + subject + '\r\n'
89 mailmsg += msg
90
91 clientSocket.send(mailmsg.encode())
92 clientSocket.send(endmsg.encode())
93 # Fill in end
94
95 # Fill in start
96 recv8 = clientSocket.recv(1024).decode()
97 print(recv8)
```

```

98  if recv8[:3] != '250':
99      print('Something wrong with data transport.')
100  # Fill in end
101
102  # Send QUIT command and get server response.
103  # Fill in start
104  QuitCommand = 'QUIT\r\n'
105  clientSocket.send(QuitCommand.encode())
106  recv9 = clientSocket.recv(1024).decode()
107  print(recv9)
108  if recv9[:3] != '221':
109      print('Something wrong with QUIT server.')
110  # Fill in end
111
112  # close
113  clientSocket.close()

```

代码运行成功：



The screenshot shows a terminal window titled '运行: main' (Run: main). The command executed is 'D:\Desktop\邮件客户端\venv\Scripts\python.exe D:\Desktop\邮件客户端\main.py'. The output shows the following SMTP conversation:

```

220 163.com Anti-spam GT for Coremail System (163com[20141201])
250 OK
235 Authentication successful
250 Mail OK
250 Mail OK
354 End data with <CR><LF>.<CR><LF>
250 Mail OK queued as zwqz-smtp-mta-g4-3,_____wDXRlfI0yhk9ic\AQ--.51285S2 1680358344

```

At the bottom, it says '进程已结束,退出代码0' (Process ended, exit code 0).

发送方邮箱：

<< 返回

再次编辑发送

回复全部

▼

转 发

▼

删 除

移动到

▼

更 多

▼

撤回邮件

I love computer networks!

🔖 📧 🕒 🗑

发件人: 我<18816576169@163.com> +

收件人: 3182443151<3182443151@qq.com> +

时 间: 2023年04月02日 22:34 (星期日)

发送状态: 发送成功 查看详情

🔥 使用阿里云无影云桌面 4核8G低至1元/月 立即抢购

I love computer networks!

接收方邮箱:

MailQQ邮箱

mail.qq.com

回复

回复全部

转发

删除

彻底删除

举报

拒收

标记为...

▼

移动到...

▼

I love computer networks! ☆

发件人: 18816576169 <18816576169@163.com> 📧

时 间: 2023年4月2日 (星期日) 下午10 : 34

收件人: 21307130076杨乙 <3182443151@qq.com>

🗎 邮件可翻译为中文 立即翻译

I love computer networks!

## 可选练习

代码运行成功:

运行: main ×

D:\Desktop\test\env\Scripts\python.exe D:\Desktop\test\main.py  
220 163.com Anti-spam GT for Coremail System (163com[20141201])  
  
250 OK  
  
235 Authentication successful  
  
250 Mail OK  
  
250 Mail OK  
  
354 End data with <CR><LF>.<CR><LF>  
  
250 Mail OK queued as zwqz-smtp-mta-g3-3,\_\_\_\_\_wAnEg3BjCtkjbMMAg--.55770S2 1680575682  
  
进程已结束,退出代码0

发送方邮箱：

<< 返回

再次编辑发送

回复全部

转发

删除

移动到

更多

撤回邮件

←

→

⚙

I love computer networks (with image) 

🔍 📄 🕒 🌐

精简信息

发件人: 我<18816576169@163.com> 

+

收件人: 3182443151<3182443151@qq.com> 

+

时 间: 2023年04月04日 11:15 (星期二)

发送状态: 发送成功 [查看详情](#)

🌐 翻译成中文

✕

🏡 伦敦皇家码头水岸豪宅, 首付仅38W! [免费咨询](#)

广告

I love computer networks!



升级邮箱会员, 享邮件误删恢复等10+项功能特权!

快速回复给: 我、3182443151

接收方邮箱：

由于 QQ 邮箱的安全机制（为防止邮件打开跟踪等攻击）不会直接显示图片。需要点击“信任此发件人”以查看图片：



## 客户端代码：

```
1  from socket import *
2  import base64
3
4  head = ("From: 18816576169@163.com\r\n" +
5         "To: 3182443151@qq.com\r\n" +
6         "Subject: I love computer networks (with image)\r\n" +
7         "MIME-Version: 1.0\r\n" +
8         "Content-Type: multipart/related;\n"
9         "boundary='separator'\r\n\r\n").encode()
10
11 htmlHead = ("--separator\r\n" +
12            "Content-Type: text/html\r\n" +
13            "Content-Transfer-Encoding: base64\r\n\r\n").encode()
14
15 htmlData = b"""
16 <html>
17   <head>
18     <title>Send an email with image</title>
19   </head>
20   <body>
21     <p>I love computer networks!</p>
22     <p><image src="cid:image1" title="This is a picture"></p>
23   </body>
24 </html>
25 """
26
27
28 htmlData_base64 = base64.b64encode(htmlData)
29
30 imageHead = ("\r\n\r\n--separator\r\n" +
31            "Content-Type: image/jpeg\r\n" +
32            "Content-Transfer-Encoding: base64\r\n" +
33            "Content-ID: image1\r\n\r\n").encode()
34
35 with open("picture.jpg", "rb") as f:
36     imageData = base64.b64encode(f.read())
```

```
37
38 headEnd = "\r\n\r\n--separator--\r\n".encode()
39
40 endmsg = "\r\n.\r\n"
41
42 msg = head
43 msg += htmlHead
44 msg += htmlData_base64
45 msg += imageHead
46 msg += imageData
47 msg += headEnd
48
49 # Choose a mail server
50 mailserver = "smtp.163.com"
51
52 # Create socket called clientSocket and establish a TCP connection with
    mailserver
53 # Fill in start
54 clientSocket = socket(AF_INET, SOCK_STREAM)
55 clientSocket.connect((mailserver, 25))
56 # Fill in end
57
58 recv = clientSocket.recv(1024).decode()
59 print(recv)
60 if recv[:3] != '220':
61     print('220 reply not received from server.')
62
63 # Send HELO command and print server response.
64 heloCommand = 'HELO Alice\r\n'
65 clientSocket.send(heloCommand.encode())
66 recv1 = clientSocket.recv(1024).decode()
67 print(recv1)
68 if recv1[:3] != '250':
69     print('250 reply not received from server.')
70
71 # send AUTH LOGIN command
72 # Fill in start
73 LoginCommand = 'AUTH LOGIN\r\n'
74 clientSocket.send(LoginCommand.encode())
75 recv2 = clientSocket.recv(1024).decode()
76 if recv2[:3] != '334':
77     print('Login failed!')
78
79 clientSocket.send(base64.b64encode('18816576169'.encode()) + b'\r\n')
80 recv3 = clientSocket.recv(1024).decode()
81 if recv3[:3] != '334':
82     print('wrong ID! Please check your input.')
83
84 clientSocket.send(base64.b64encode('UKMGZMWAFBKWUFAH'.encode()) + b'\r\n')
85 recv4 = clientSocket.recv(1024).decode()
86 print(recv4)
87 if recv4[:3] != '235':
88     print('wrong password! Please try again.')
89 # Fill in end
90
```

```
91 # Send MAIL FROM command and print server response.
92 # Fill in start
93 send_mail_addr = '18816576169@163.com'
94 MailFromCommand = 'MAIL FROM: <' + send_mail_addr + '>\r\n'
95 clientSocket.send(MailFromCommand.encode())
96 recv5 = clientSocket.recv(1024).decode()
97 print(recv5)
98 if recv5[:3] != '250':
99     print('Something wrong with MAIL FROM server.')
100 # Fill in end
101
102 # Send RCPT TO command and print server response.
103 # Fill in start
104 rec_mail_addr = '3182443151@qq.com'
105 RcptToCommand = 'RCPT TO: <' + rec_mail_addr + '>\r\n'
106 clientSocket.send(RcptToCommand.encode())
107 recv6 = clientSocket.recv(1024).decode()
108 print(recv6)
109 if recv6[:3] != '250':
110     print('Something wrong with RCPT TO server.')
111 # Fill in end
112
113 # Send DATA command and print server response.
114 # Fill in start
115 DataCommand = 'DATA\r\n'
116 clientSocket.send(DataCommand.encode())
117 recv7 = clientSocket.recv(1024).decode()
118 print(recv7)
119 if recv7[:3] != '354':
120     print('Something wrong with data_send_begin.')
121 # Fill in end
122
123 # Send message data.
124 # Fill in start
125 clientSocket.send(msg)
126 clientSocket.send(endmsg.encode())
127 # Fill in end
128
129 # Fill in start
130 recv8 = clientSocket.recv(1024).decode()
131 print(recv8)
132 if recv8[:3] != '250':
133     print('Something wrong with data transport.')
134 # Fill in end
135
136 # Send QUIT command and get server response.
137 # Fill in start
138 QuitCommand = 'QUIT\r\n'
139 clientSocket.send(QuitCommand.encode())
140 recv9 = clientSocket.recv(1024).decode()
141 if recv9[:3] != '221':
142     print('Something wrong with QUIT server.')
143 # Fill in end
144
145 # close
```



```
146 | clientSocket.close()
147 |
```

### 对代码的解释：

练习要求“发送包含文本和图像的电子邮件”，说明需要将图片嵌入邮件消息内，而不是作为附件发送。为实现上述要求，选择发送 html，并将图片嵌入 html 当中

因此在这一封邮件中，包含了 html 数据、图片数据两部分。因此我们要将邮件的 `Content-Type` 域指定为 `multipart/related`，将图片以内嵌资源的方式存储在邮件中

上述两部分数据要有各自的消息头。其中 html 数据的 `Content-Type` 域为 `text/html`；图片数据的 `Content-Type` 域为 `image/jpeg`。并且各个数据部分需要通过 `boundary` 在开始部分和结尾部分进行封装

同时，为嵌入图片，需要将图片数据的 `Content-ID` 域设置为 `image1` 并且在 html 的 `img` 标签中引用 `src="cid:image1"`。图片数据直接读取图片获得