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# SMTP Client with SSL/TLS



David Johns, John\_Tang, 18 Aug 2013

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C++ SMTP client, support SSL and TLS encrypted connection to SMTP server Info

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### Introduction

I needed to send emails in a product written in C++, so I searched the Internet and found a great article: SMTP Client written by Jakub Piwowarczyk. However, many of my clients use SMTP servers that require secure connection (TLS or SSL), and the SMTP Client does not support it. So I had to add SSL/TLS support to the CSmtp class from SMTP Client before I could use it in my product. As I was new to SSL/OpenSSL, it did take me quite some time to learn how to use it properly, and to make the code work with several popular SMTP servers. I have also seen people searching the internet looking for a C++ implementation of SMTP/SSL/TLS, but just could not find one. So I decided to share the one I wrote, in the hope that it will save people who are not familiar with SSL some time.

Note that this article does not cover the details of SMTP. Please go to the original article SMTP Client if you need to know more about SMTP.

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# Background

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There are 2 kinds of secure connections for SMTP, one is SSL and the other is TLS. Some SMTP servers support only one kind and some support both. Generally speaking, the port for



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SSL is 465, and the port for TLS is 587, but this is not always the case. In addition to the ports being different, SMTP/SSL is different than SMTP/TLS in that, SMTP/SSL negotiates an encrypted connection directly after the underlying TCP connection has been established, while SMTP/TLS requires that the client send a STARTLS command to the server before they negotiate an encrypted connection.

The steps involved in SMTP/SSL are as follows:

- 1. The client connects to the server using TCP.
- 2. The client negotiates an encrypted connection with the server.
- 3. The server sends a welcome message using the encrypted connection to the client.
- 4. The client sends a EHLO command using the encrypted connection to the server.
- 5. The server responds to the EHLO command using the encrypted connection.

The steps involved in SMTP/TLS are as follows:

- 1. The client connects to the server using TCP.
- 2. The server sends a welcome message using the unencrypted connection to the client.
- 3. The client sends a EHLO command using the unencrypted connection to the server.
- 4. The server responds to the EHLO command using the un-encrypted connection.
- 5. The client sends a **STARTTLS** command using the unencrypted connection to the server.
- 6. The server responds to the **STARTTLS** command using the un-encrypted connection.
- 7. The client negotiates an encrypted connection with the server.
- 8. The client sends a EHLO command using the encrypted connection to the server.
- 9. The server responds to the EHLO command using the encrypted connection.

# Using the Code

I have used openssl (http://www.openssl.org) in the sample code. The directory "openssl-0.9.8l" in the sample code contains all the necessary header files and the two pre-built static openssl libraries. If you would also like to use this version of openssl in your code, be sure to copy the entire "openssl-0.9.8l" directory to the root directory of your project and add "openssl-0.9.8l\inc32" to "Additional Include Directories", and also add "openssl-0.9.8l\out32" to "Additional Library Directories".

If you would like to build your own openss1, please refer to http://www.openssl.org for detailed instructions.

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```
#define test_gmail_tls
    CSmtp mail;
#if defined(test_gmail_tls)
    mail.SetSMTPServer("smtp.gmail.com",587);
    mail.SetSecurityType(USE_TLS);
#elif defined(test_gmail_ssl)
    mail.SetSMTPServer("smtp.gmail.com",465);
    mail.SetSecurityType(USE SSL);
#elif defined(test_hotmail_TLS)
    mail.SetSMTPServer("smtp.live.com",25);
    mail.SetSecurityType(USE_TLS);
#elif defined(test_aol_tls)
    mail.SetSMTPServer("smtp.aol.com",587);
    mail.SetSecurityType(USE_TLS);
#elif defined(test_yahoo_ssl)
mail.SetSMTPServer("plus.smtp.mail.yahoo.com",465);
    mail.SetSecurityType(USE_SSL);
    mail.SetLogin("***");
    mail.SetPassword("***");
    mail.SetSenderName("User");
    // .....
    mail.Send();
```

If you use a non-privileged user account to test Yahoo, the mail will fail to send. And the error message returned by the Yahoo SMTP server is "530 Access denied: Free users cannot access this server".

### **Notes**

- The code does not verify the server's identity, that is, it
  does not check the server's certificate. This is usually not
  a big problem if we make sure we feed the program
  with correct server addresses. However, it is still worth
  mentioning that there is the chance that we are talking
  to an impersonator if we don't check the certificate.
- You are not allowed to use the code in this article for spamming.

### References

- SMTP Client by Jakub Piwowarczyk
- http://www.openssl.org
- An Introduction to OpenSSL Programming by Eric Rescorla

# History

• Rev 2.3, 2013/08/17

Thanks to everyone for the effective crowdsourcing! Please keep up the improvements to our library!

- Removed Bcc from the header as contributed by o15s19
- Added fix contributed by uni\_gauldoth with attaching files with a reserved character in their filename
- Improved the method for checking the size of file attachments as contributed by GKarRacer
- Added #include <unistd.h> for linux compiles as contributed by jim fred

#### Rev 2.2, 2013/05/06

- Added fix contributed GKarRacer for the improper checking of the MsgBody.size() before working with a line of the message body.
- Moved memory allocation and checking if all attachments can be opened to before the MAIL command is issued so that if there is an issue with one of them, sending the email can be gracefully aborted without the email being sent without the attachments.
- Changed all the sprintf commands to snprintf to add greater security.
   #define'd snprintf to sprintf\_s for MS Visual C. Also changed most strcpy calls to snprintf since the MS Visual C version of that function strcpy\_s has the arguments re-ordered so it wouldn't be possible to use it without affecting portability.
- Added fix contributed by jcyangzh about a possible infinite loop in the SayQuit function.
- Added fixes contributed by sbrytskyy required to make the AUTH PLAIN login work properly.

#### • Rev 2.1, 2012/11/06

- Added fixes contributed by Alan P Brown for the invalid references to the SMTP\_SECURITY\_TYPE enumeration.
- Added modifications contributed by Oleg Dolgov that allow it to compile in Debian Linux.
- Added feature inspired by Leon Huang and John Tang that allows you to change the character set from the still default US-ASCII to whatever you like by calling the new member function SetCharSet().
- Added feature inspired by Gospa that allows you to request a read receipt by calling the new member function SetReadReceipt().

- Added modification inspired by Spike that distinguishes between Linux and Windows path delimiters in the attachment paths.
- Added modifications inspired by Spike that uses a more simple and portable method of setting the std::string variables.
- Added feature contributed by Jerko that allows you to set the local host name by calling the new SetLocalHostName() member function. If you do not call this function, it works the same as it did before.
- Added modifications contributed by Korisk that allows it to more cleanly compile in Linux.
- Added fixes contributed by Angenua Grupoi that fixes the behavior when the m\_sNameFrom variable is not populated.

#### Rev 2.0, 2011/06/23

- Added the m\_bAuthenticate member variable
  to be able to disable authentication even though
  it may be supported by the server. It defaults to
  true so if it is not set, the library will act as it
  would have before the addition.
- Added the ability to pass the security type, m\_type, the new m\_Authenticate flag, the login and password into the ConnectRemoteServer function. If these new arguments are not included in the call, the function will work as it did before.
- Added the ability to pass the new
   m\_Authenticate flag into the SetSMTPServer
   function. If not provided, the function will act as it
   would before the addition.
- Added fixes contributed by Martin Kjallman
- Added fixes contributed by Karpov Andrey
- Added fixes contributed by Jakub Piwowarczyk

#### Rev 1.9, 2010/08/19

- Added PLAIN, CRAM-MD5 and DIGESTMD5 authorization.
- Added a DisconnectRemoteServer() function and reconfigured the Send() function such that if you have already called the
   ConnectRemoveServer() function, it will use the existing connection and leave the connection open. This allows you to call
   ConnectRemoteServer(), then send multiple messages on the same connection. If this approach is used, you have to call
   DisconnectRemoteServer() to close the connection. If you call Send() without calling
   ConnectRemoteServer(), it will close the connection after sending. This change should be fully backward compatible.

- Rev 1.8, 2010/08/09
  - Updates according to Hector Santos's comment
- 2010/08/03
  - Modified Introduction
- 2010/08/02
  - Added note
- 2010/08/01
  - Initial post

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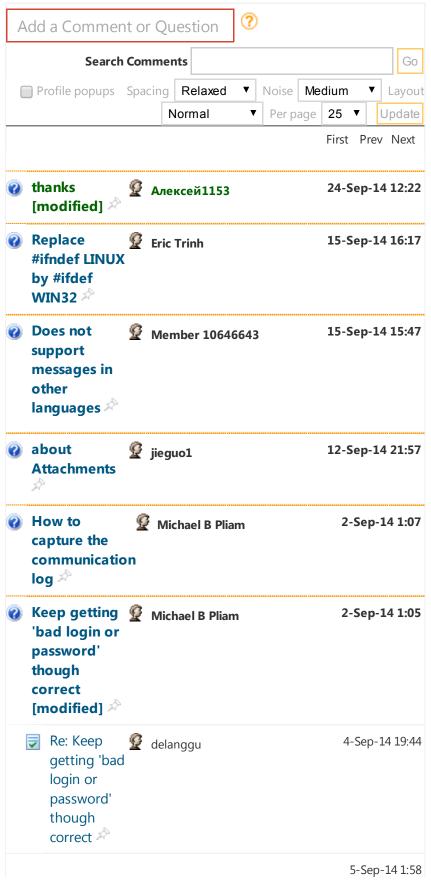
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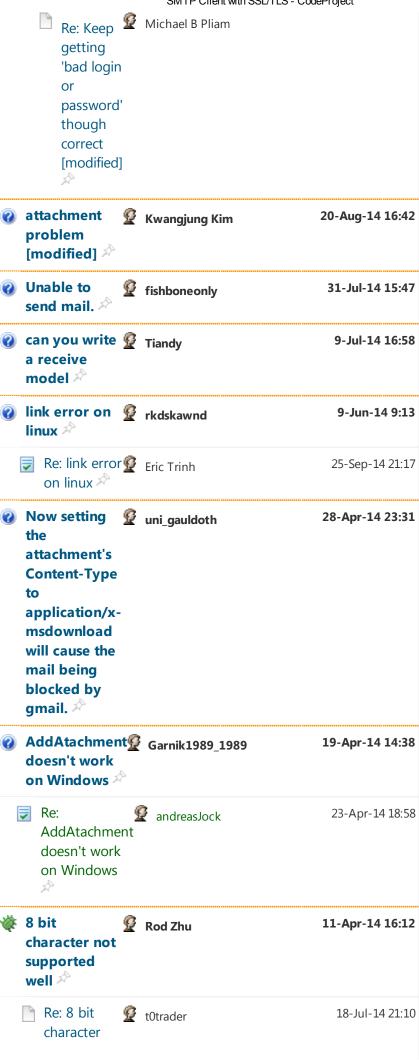


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