

Client / Server
Communications
Reference Library

(CSC_REF)

Version 7.0

March 12, 2015

*This software is provided as-is.
There are no warranties, expressed or implied.*

Copyright (C) 2015
All rights reserved

MarshallSoft Computing, Inc.
Post Office Box 4543
Huntsville AL 35815 USA

Voice : 1.256.881.4630
web : www.marshallsoft.com

MARSHALLSOFT is a registered trademark of MarshallSoft Computing.

TABLE OF CONTENTS

1	Introduction	Page 3
1.1	General Remarks	Page 3
1.2	Documentation Set	Page 4
1.3	Declaration Files	Page 4
1.4	Language Notes	Page 5
2	CSC Functions	Page 6
2.1	cscAcceptConnect	Page 6
2.2	cscAttach	Page 7
2.3	cscAwaitConnect	Page 8
2.4	cscAwaitData	Page 9
2.5	cscByteToShort	Page 10
2.6	cscChallenge	Page 11
2.7	cscClient	Page 12
2.8	cscClientExt	Page 13
2.9	cscClose	Page 14
2.10	cscConnectMessage	Page 15
2.11	cscCreateUDP	Page 16
2.12	cscCryptoGetData	Page 17
2.13	cscCryptoGetFile	Page 18
2.14	cscCryptoGetFileExt	Page 19
2.15	cscCryptoGetPacket	Page 20
2.16	cscCryptoPutData	Page 21
2.17	cscCryptoPutFile	Page 22
2.18	cscCryptoPutFileExt	Page 23
2.19	cscCryptoPutPacket	Page 24
2.20	cscDataCRC	Page 25
2.21	cscDataMessage	Page 26
2.22	cscErrorText	Page 27
2.23	cscFileCRC	Page 28
2.24	cscFillRandom	Page 29
2.25	cscGetData	Page 30
2.26	cscGetFile	Page 31
2.27	cscGetFileExt	Page 32
2.28	cscGetInteger	Page 33
2.29	cscGetPacket	Page 34
2.30	cscGetString	Page 35
2.31	cscGetUDP	Page 36
2.32	cscIsConnected	Page 37
2.33	cscMakeDotted	Page 38
2.34	cscMakeDotted4	Page 39
2.35	cscMulticast	Page 40
2.36	cscNetToHost32	Page 42
2.37	cscPutData	Page 42
2.38	cscPutFile	Page 43
2.39	cscPutFileExt	Page 44
2.40	cscPutPacket	Page 45
2.41	cscPutUDP	Page 46
2.42	cscReadSize	Page 47
2.43	cscRelease	Page 48
2.44	cscResolve	Page 49
2.45	cscResponse	Page 50
2.46	cscServer	Page 51
2.47	cscSetInteger	Page 52
2.48	cscSetString	Page 54
2.49	cscShortToByte	Page 55
2.50	cscSleep	Page 56
2.51	cscSystemTicks	Page 57
2	CSC Error Return Code List	Page 58

1 Introduction

The **Client / Server Communications Library (CSC)** is a component library of functions used to create **server** and **client** programs that can communicate with each other across any TCP/IP network such as the Internet or a private network (intranet or LAN [local area net]). Refer to the **CSC User's (CSC_USR.PDF)** for information on the **CSC SDK**. The **Client/Server Communication DLLs** will run under all versions of Windows (95/ME/2000/2003/2012/XP/Vista/NT/Win7/Win8/x64). Both Win32 and Win64 DLLs are included.

1.1 General Remarks

All functions return an integer code. Negative values are always an error. See "CSC Error Codes" in Section 3. Non-negative return codes are never an error.

Note that the **cscErrorText** function is used to get the text message associated with any error code.

Each function argument is marked as:

- (I) : 4-byte integer (Win32/Win64).
- (S) : 2-byte short integer (Win32/Win64).
- (P) : 4-byte pointer (Win32/Win64).

Refer to the declaration files (see Section 1.3 below) for the exact syntax of each **CSC** function. Also note that the example programs show exactly how **CSC** functions are called.

All network functions are TCP unless specifically noted as for UDP.

For the latest version of the **CSC** software, see <http://www.marshallsoft.com/client-server-communication.htm>

1.2 Documentation Set

The complete set of documentation is provided in Adobe PDF format. This is the third manual (CSC_REF.PDF) in the set.

- [CSC 4x Programmer's Manual](#) (CSC_4x.PDF)
- [CSC User's Manual](#) (CSC_USR.PDF)
- [CSC Reference Manual](#) (CSC_REF.PDF)

The CSC_4x Programmer's Manual is the programming language specific manual. All language dependent programming issues including installation, compiling and example programs are discussed in this manual. The language specific manuals are as follows:

[NAME]	[DESCRIPTION]
CSC 4C	: CSC Programmer's Manual for C/C++
CSC 4VB	: CSC Programmer's Manual for Visual Basic
CSC 4D	: CSC Programmer's Manual for Delphi
CSC 4FP	: CSC Programmer's Manual for Visual FoxPro
CSC 4DB	: CSC Programmer's Manual for Visual dBase
CSC 4XB	: CSC Programmer's Manual for XBase++

The CSC User's Manual ([CSC_USR.PDF](#)) discusses client/server programming issues. License and purchase information is also provided. Read this manual after reading the CSC Programmer's Manual.

The CSC Reference Manual ([CSC_REF.PDF](#)) contains details on each individual CSC function.

All documentation can also be accessed online at <http://www.marshallsoft.com/client-server-communication.htm>

1.3 Declaration Files

The exact syntax for calling CSC functions is specific to the host language (C/C++, Delphi, VB, etc.) and is defined for each language in the "CSC declaration files". Each Client/Server Communications Library product comes with the appropriate declaration file for the supported language. For example,

CSC4C	C/C++, C++ .NET	CSC.H
CSC4VB	Visual Basic	CSC32.BAS
	VB.NET	CSC32.VB
	VBA (EXCEL, ACCESS, etc.)	CSC32.BAS
CSC4D	Borland Delphi	CSC32.PAS
CSC4FP	Visual FoxPro	CSC32.FOX
CSC4XB	Xbase++	CSC32.CC
CSC4DB	Visual dBase	CSC32.CH

We also have declaration files (and some example programs) for PowerBASIC and Fujitsu COBOL.

1.4 Language Notes

All language versions of **CSC** include the example program **CSCVER**. Refer to this program and the declaration file as defined in Section 1.3 above to see how **CSC** functions are called. The **CSCVER** program is also the first program that should be compiled and run.

The best way to see how a function is called is to find it used in one of the example programs. All **CSC** functions are used in one or more examples.

See “Using **CSC** with Supported Languages” in the **CSC** User’s Manual ([CSC_USR.PDF](#))

1.4.1 C/C++/C#

Project files and/or makefiles supplied for the example programs. **CSC** supports all 32-bit and 64-bit versions of Microsoft Visual C/C++, Visual C++ .NET and Visual C#, and 32-bit Borland C/C++, Borland C++ Builder, Watcom C/C++, Win32-LCC, Win64-LCC, Digital Mars, and MinGW C++.

1.4.2 Delphi

Functions defined in the Delphi Unit **CSCW.PAS** begin with "f" rather than "csc".

All versions of 32-bit and 64-bit Delphi through Delphi XE4 are supported.

1.4.3 Visual Basic (and VB.NET)

All versions of Visual Basic are supported through VB.NET (Visual Studio 2012).

1.4.4 Visual FoxPro

All strings passed to **CSC** functions must be prefixed with the '@' character. All versions of 32-bit Visual FoxPro are supported.

1.4.5 Visual dBase

CSC works with all versions of Visual dBase.

1.4.6 Xbase++

Functions defined for Xbase++ begin with 'X'. All strings passed to **CSC** functions must be prefixed with the '@' character.

2 CSC Functions

2.1 **cscAcceptConnect** :: Accept Connection from Client.

SYNTAX

```
cscAcceptConnect (vSock)
```

```
    vSock : (I) Virtual (listener) socket number.
```

REMARKS

This function is used by the server to accept a connection from a client. **cscAcceptConnect** returns the (virtual) socket number that must be used in all subsequent calls to **CSC** functions that have a socket argument. Note that **cscAcceptConnect** can only be used in a server application.

EXAMPLE (C/C++ and VB)

```
Code = cscAcceptConnect(vSock)
```

```
    vSock : (I) Virtual (listener) socket number.
```

RETURNS

```
< 0 : Error. See error list.
```

```
>= 0 : Virtual data socket.
```

2.2 `cscAttach` :: Initializes the CSC DLL.

SYNTAX

```
cscAttach(DataSocks, ListenSocks, KeyCode)
```

```
DataSocks    : (I) Number of (data) virtual communications sockets.  
ListenSocks  : (I) Number of (listen) virtual communications sockets.  
KeyCode      : (I) Key code.
```

REMARKS

The `cscAttach` function must be the first **CSC** function called, and is used to pass the keycode (assigned when the library is purchased) and the number of sockets to allow for both data and for listening for new connections.

For client applications, 'DataSocks' is the number of servers that the clients wants to connect to concurrently. This value is normally one. 'ListenSocks' is always zero for client applications.

For server applications, 'DataSocks' is the number of concurrent data connections (to clients) that are to be supported concurrently, and 'ListenSocks' is the number of different ports that a server wants to be able to accept connections to concurrently. This value is normally one.

EXAMPLE (C/C++ and VB)

```
// allow 1 data port and no listening ports, with keycode 0  
Code = cscAttach(1, 0, 0)
```

RETURNS

```
< 0 : Error. See error list.  
>= 0 : No error.
```

2.3 **cscAwaitConnect** :: Wait for Connection Attempt from Client.

SYNTAX

```
cscAwaitConnect(vSock, Timeout)
```

```
vSock      : (I) Virtual (listen) socket number.  
Timeout    : (I) Timeout value in milliseconds.
```

REMARKS

This **cscAwaitConnect** function is used by a server program to wait a maximum specified time (in milliseconds) for a connection to be accepted from a client program.

EXAMPLE (C/C++)

```
if(cscAwaitConnect(ListenSock, 1000))  
{// accept connection from client  
  DataSock = cscAcceptConnect(ListenSock);
```

EXAMPLE (VB)

```
if cscAwaitConnect(ListenSock, 1000) <> 0 Then  
  'accept connection from client  
  DataSock = cscAcceptConnect(ListenSock)
```

RETURNS

```
Returns TRUE  : Client attempting to connect.  
Returns FALSE : No connection attempt detected.
```


2.4 **cscAwaitData** :: Wait for Incoming Data.

SYNTAX

```
cscAwaitData(vSock, Timeout)
```

```
vSock      : (I) Virtual (data) socket number.  
Timeout    : (I) Timeout value in milliseconds.
```

REMARKS

This **cscAwaitData** function is used to wait a specified time (in milliseconds) for incoming data from either a client or a server application.

This function should normally be called before calling **cscGetData**, **cscGetFile**, or **cscGetPacket**.

EXAMPLE (C/C++)

```
char Buffer[128];  
// wait (up to 2 seconds) for incoming data  
if(cscAwaitData(DataSock, 2000))  
{// read data  
    Code = cscGetData(DataSock, (char *)Buffer, 128);
```

EXAMPLE (VB)

```
Dim Buffer As String * 128  
' wait (up to 2 seconds) for incoming data  
if cscAwaitData(DataSock, 2000) <> 0 Then  
' read data  
    Code = cscGetData(DataSock, Buffer, 128)
```

RETURNS

```
Returns TRUE  : Data is ready to be read.  
Returns FALSE : No data is ready.
```

2.5 **cscByteToShort** :: Converts 8-bit Character Buffer to 16-bit

SYNTAX

```
cscByteToShort(Buffer)
```

```
    Buffer : (P) character buffer
```

REMARKS

The **cscByteToShort** function converts the (null terminated) character buffer 'Buffer' from 8-bit ASCII characters to 16-bit Unicode ASCII characters.

The buffer must be null terminated (last character is a hex 00) and the buffer must be at least twice the size (in bytes) of the character string (since 16-bit characters require twice the space as 8-bit characters).

This function is only necessary when working with 16-bit Unicode ASCII characters in Visual C# and Delphi 2005/2007/2009.

RETURNS

None.

EXAMPLE (C#)

Refer to the Visual C# example ClientCS.csproj

```
char[] UnsafeBuffer = new char[128];
// get the registration string
fixed (char* pBuffer = UnsafeBuffer)
Code = cscGetString(-1, CSC_GET_REGISTRATION, pBuffer, 51);
if(Code>0)
    {
    // convert (null terminated) UnsafeBuffer[] to 16-bit chars (unicode)
    fixed (char* pBuffer = UnsafeBuffer)
        cscByteToShort(pBuffer);
    }
}
```

ALSO SEE

cscShortToByte

2.6 `cscChallenge` :: Construct Challenge String

SYNTAX

```
cscChallenge(Buffer)
```

`Buffer` : (P) Buffer into which the challenge string is copied.

REMARKS

The `cscChallenge` function is used to construct a random 8-byte challenge string to be used to challenge the client before continuing with the connection.

The purpose of the `cscChallenge` and `cscResponse` functions is to create a challenge / response protocol in order to defeat hackers who may try to connect to your server.

Also see `cscResponse`, which computes the response to the challenge string.

EXAMPLE (C/C++)

```
char Challenge[9]; // challenge string
// create random 8-digit number
Code = cscChallenge((char *)Challenge);
```

EXAMPLE (VB)

```
Dim Challenge As String * 9
' create random 8-digit number
Code = cscChallenge(Challenge)
```

RETURNS

Returns the length of the challenge string, which is always 8.

2.7 **cscClient** :: Starts the Client.

SYNTAX

```
cscClient(ServerName, ServerPort)
```

```
ServerName : (P) Server name.  
ServerPort : (I) Server port.
```

REMARKS

The **cscClient** is function is used to start the client which attempts to connect to the server and port specified. Note that the server must already be running before a connection can be established. **cscClient** returns the (virtual) socket number that must be used in all subsequent calls to **CSC** functions that have a socket argument. Note that **cscClient** can only be used in a TCP client application.

EXAMPLE (C/C++)

```
char *HostName = "10.0.0.6";  
short HostPort = 5001;  
int DataSock;  
// attempt to connect to server  
DataSock = cscClient(HostName, HostPort);
```

EXAMPLE (VB)

```
Dim HostName As String  
Dim HostPort As Integer  
Dim DataSock As Integer  
HostName = "10.0.0.2"  
HostPort = 5001  
' attempt to connect to server  
DataSock = cscClient(HostName, HostPort)
```

RETURNS

```
>= 0 : Virtual (data) socket number  
else : Error (See error list)
```

2.8 **cscClientExt** :: Starts the Client.

SYNTAX

```
cscClient2(ServerName, ServerPort, LocalName)
```

```
ServerName : (P) Server name.  
ServerPort : (I) Server port.
```

REMARKS

The **cscClient2** is function is used to start the client which attempts to connect to the server and port specified, binding the data socket to the IP address.

Note that the server must already be running before a connection can be established. **cscClientExt** returns the (virtual) socket number that must be used in all subsequent calls to **CSC** functions that have a socket argument. Note that **cscClientExt** can only be used in a TCP client application.

EXAMPLE (C/C++)

```
char *HostName = "10.0.0.6";  
char *LocalName = "10.0.0.14";  
short HostPort = 5001;  
int DataSock;  
// attempt to connect to server  
DataSock = cscClient(HostName, HostPort, LocalName);
```

EXAMPLE (VB)

```
Dim HostName As String  
Dim LocalName As String  
Dim HostPort As Integer  
Dim DataSock As Integer  
HostName = "10.0.0.2"  
LocalName = "10.0.0.14";  
HostPort = 5001  
' attempt to connect to server  
DataSock = cscClient2(HostName, HostPort, LocalName)
```

RETURNS

```
>= 0 : Virtual (data) socket number  
else : Error (See error list)
```

2.9 cscClose :: Closes a Connection.

SYNTAX

```
cscClose(vSock)
```

vSock : (I) Virtual socket number.

REMARKS

The **cscClose** function closes a connection previously opened. Call this function only to close an open connection.

EXAMPLE (C/C++ and VB)

```
Code = cscClose(vSock)
```

RETURNS

< 0 : Error. See error list.
>= 0 : No error.

2.10 `cscConnectMessage` :: Sends Windows Message (on Connect).

SYNTAX

```
cscConnectMessage(Handle, vSock)
```

```
Handle    : (I) Windows Handle  
vSock     : (I) Virtual listen socket.  
Message   : (I) Message (usually WM_USER)
```

REMARKS

The `cscConnectMessage` function sends a Windows message to the window with handle 'Handle' when a connection from a client is ready to be accepted.

Refer to the windows server example programs.

EXAMPLE (C/C++)

```
// Send WM_USER message when connection is ready to connect  
cscConnectMessage((long)hMainWnd, ListenSock, WM_USER);
```

EXAMPLE (VB)

```
Const WM_LBUTTONDOWN = &H201  
' send WM_LBUTTONDOWN message when connection is ready to connect  
Code = cscConnectMessage(Client.bReady.hWnd, ListenSock, WM_LBUTTONDOWN)
```

RETURNS

```
< 0 : Error. See error list.  
>= 0 : No error.
```

2.11 **cscCreateUDP** :: Creates UDP Socket.

SYNTAX

```
cscCreateUDP(LocalPort, LocalHost)
```

```
LocalPort : (I) Local port  
LocalHost : (I) Local host name.
```

REMARKS

The **cscCreateUDP** function creates a UDP socket that is used by **cscGetUDP** and **cscPutUDP** functions only. The UDP socket is closed with **cscClose**.

Refer to the uEcho_S (UDP server) and uEcho_C (UDP client) example programs.

EXAMPLE (C/C++)

```
// Create UDP socket  
vSock = cscCreateUDP(ECHO_PORT, (char *)"127.0.0.1");
```

EXAMPLE (VB)

```
' Create UDP socket  
LocalHost = "127.0.0.1"  
vSock = cscCreateUDP(ECHO_PORT, LocalHost)
```

RETURNS

```
< 0 : Error. See error list.  
>= 0 : No error.
```


2.12 cscCryptoGetData :: Receives Encrypted Data.

SYNTAX

```
cscCryptoGetData(vSock, Buffer, BufLen, PadChars, PadLen)
```

```
vSock    : (I) Virtual (data) socket.  
Buffer   : (P) Buffer into which to copy bytes.  
BufLen   : (I) Length of above buffer.  
PadChars : (P) Buffer of "pad" bytes.  
PadLen   : (I) Length of above 'pad' buffer.
```

REMARKS

The **cscCryptoGetData** function is used to receive encrypted data from an established connection. All available data is copied to 'Buffer' up to a maximum of 'BufLen'. **cscCryptoGetData** never waits for data.

The received bytes in 'Buffer' have been XOR'ed with the bytes in 'PadChars'. If PadLen < BufLen, the XOR'ing continues in Buffer at the beginning of the pad buffer (wrap around).

Also read Section 2.11, "Encryption", in the CSC User's Manual ([CSC_USR.PDF](#)).

EXAMPLE (C/C++)

```
char Temp[128];  
// read data (up to 128 bytes)  
Code = cscCryptoGetData(DataSock, (char *)Temp, 128,  
                        (char *)PadChars, PadLen);
```

EXAMPLE (VB)

```
Dim Temp As String  
Temp = Spaces(128)  
' read data (up to 128 bytes)  
Code = cscCryptoGetData(DataSock, Temp, 128, PadChars, PadLen)
```

RETURNS

```
< 0 : Error. See error list.  
>= 0 : Number of bytes copied to Buffer.
```

2.13 `cscCryptoGetFile` :: Receives an Encrypted File.

SYNTAX

```
cscCryptoGetFile(vSock, FileName, PadChars, PadLen)
```

```
vSock      : (I) Virtual (data) socket number.  
Filename  : (P) Filename (not path) for incoming file or NULL.  
PadChars  : (P) Buffer of "pad" bytes.  
PadLen    : (I) Length of above 'pad' buffer.
```

REMARKS

The `cscCryptoGetFile` function is used to receive an encrypted file from an established connection transmitted from the `cscCryptoPutFile` function.

The received bytes in 'Buffer' have been XOR'ed with the bytes in 'PadChars'. If `PadLen < BufLen`, the XOR'ing continues in Buffer at the beginning of the pad buffer (wrap around).

Specify the filename under which the file is to be saved, or specify an asterisk ("*") to save under the filename sent with the file. Then call `cscCryptoGetFile` repeatedly in a loop until 0 is returned.

The incoming data stream will contain the filename and the length of the file, followed by the (binary) file itself. The filename can be recovered by use of the `cscGetString` function and the file length can be recovered by use of the `cscGetInteger` function.

Also see `cscSetString` (-1, `CSC_SET_FILE_PATH`, ...) to specify the file directory into which the file is to be saved.

Also read Section 2.11, "Encryption", in the CSC User's Manual ([CSC_USR.PDF](#)).

EXAMPLE (C/C++)

```
// prepare to receive file, saving to disk  
Code = cscCryptoGetFile(DataSock, (char *)"*", (char *)PadChars, PadLen);  
// receive file in 4K blocks  
while(Code!=0) Code = cscCryptoGetFile(DataSock, NULL,  
                                     (char *)PadChars, PadLen);
```

EXAMPLE (VB)

```
' prepare to receive file, saving to disk  
X = "*" + Chr(0)  
Code = cscCryptoGetFile(DataSock, X, PadChars, PadLen)  
// receive file in 4K blocks  
EmptyString = Chr(0)  
While Code <> 0  
    Code = cscCryptoGetFile(DataSock, EmptyString, PadChars, PadLen)
```

RETURNS

```
< 0 : Error. See error list.  
>= 0 : No error.
```

2.14 `cscCryptoGetFileExt` :: Receives an Encrypted File (Extended).

SYNTAX

```
cscCryptoGetFileExt(vSock, FileName, PadChars, PadLen)
```

```
vSock      : (I) Virtual (data) socket number.  
FileFlag   : (I) T: setup, F: send data packets.  
PadChars   : (P) Buffer of "pad" bytes.  
PadLen     : (I) Length of above 'pad' buffer.
```

REMARKS

The `cscCryptoGetFileExt` function is used to receive an encrypted file from an established connection transmitted from the `cscCryptoPutFileExt` function. If the file exists on the receiver and has the same size as on the sender, the file is not sent again.

The received bytes in 'Buffer' have been XOR'ed with the bytes in 'PadChars'. If `PadLen < BufLen`, the XOR'ing continues in Buffer at the beginning of the pad buffer (wrap around).

Specify the filename under which the file is to be saved, or specify an asterisk ("*") to save under the filename sent with the file. Then call `cscCryptoGetFileExt` repeatedly in a loop until 0 is returned.

The incoming data stream will contain the filename and the length of the file, followed by the (binary) file itself. The filename can be recovered by use of the `cscGetString` function and the file length can be recovered by use of the `cscGetInteger` function.

The `cscCryptoGetFileExt` function transfers only that part of the specified file that has not already been transferred. If only part of a file is transferred (because of a network or computer malfunction), the function will resume the file transfer without having to send the entire file over again.

Also see `cscSetString` (-1, `CSC_SET_FILE_PATH`, ...) to specify the file directory into which the file is to be saved.

Also read Section 2.11, "Encryption", in the CSC User's Manual ([CSC_USR.PDF](#)).

EXAMPLE (C/C++)

```
// prepare to receive file, saving to disk  
Code = cscCryptoGetFileExt(DataSock, 1, (char *)PadChars, PadLen);  
// receive file in 4K blocks  
while(Code!=0)  
    Code = cscCryptoGetFileExt(DataSock, 0, (char *)PadChars, PadLen);
```

EXAMPLE (VB)

```
' prepare to receive file, saving to disk  
Code = cscCryptoGetFileExt(DataSock, 1, PadChars, PadLen)  
' receive file in 4K blocks  
While Code <> 0 Code = cscCryptoGetFileExt(DataSock, 0, PadChars, PadLen)
```

RETURNS

```
< 0 : Error. See error list.  
>= 0 : No error.
```

2.15 cscCryptoGetPacket :: Receives an Encrypted Packet.

SYNTAX

```
cscCryptoGetPacket(vSock, Buffer, BufLen, PadChars, PadLen)
```

```
vSock    : (I) Virtual (data) socket.  
Buffer   : (P) Buffer into which to copy bytes.  
BufLen   : (I) Length of above buffer.  
PadChars : (P) Buffer of "pad" bytes.  
PadLen   : (I) Length of above "pad" buffer.
```

REMARKS

The **cscCryptoGetPacket** function is used to receive the next encrypted packet from an established connection. The next packet is copied to 'Buffer' up to a maximum of 'BufLen'. **cscCryptoGetPacket** waits for a maximum of 10 seconds (default) for the next packet..

Packets can vary from 1 to 10,000 bytes in length. **cscCryptoGetPacket** will not return until the entire packet has been received.

The received bytes in 'Buffer' have been XOR'ed with the bytes in 'PadChars'. If PadLen < BufLen, the XOR'ing continues in Buffer at the beginning of the pad buffer (wrap around).

Also read Section 11, "Encryption", Section 2.8, "Stream Data I/O" and Section 2.9, "Packet Data I/O" in the CSC User's Manual ([CSC_USR.PDF](#)).

EXAMPLE (C/C++)

```
char Temp[128];  
// read data (up to 128 bytes)  
Code = cscCryptoGetPacket(DataSock, (char *)Temp, 128,  
                           (char *)PadChars, PadLen);
```

EXAMPLE (VB)

```
Dim Temp As String * 128  
' read data (up to 128 bytes)  
Code = cscCryptoGetPacket(DataSock, Temp, 128, PadChars, PadLen)
```

RETURNS

```
< 0 : Error. See error list.  
>= 0 : Number of bytes copied to Buffer (packet size).
```

2.16 cscCryptoPutData :: Transmits Encrypted Data.

SYNTAX

```
cscCryptoPutData(vSock, Buffer, BufLen, PadChars, PadLen)
```

```
vSock      : (I) Virtual (data) socket number.  
Buffer     : (P) Data to write.  
BufLen     : (I) Length of above buffer (# bytes to write).  
PadChars   : (P) Buffer of "pad" bytes.  
PadLen     : (I) Length of above 'pad' buffer.
```

REMARKS

The **cscCryptoPutData** function is used to write (transmit) an encrypted buffer to an established connection.

The bytes in 'Buffer' are XOR'ed with the bytes in 'PadChars' before sending. If PadLen < BufLen, the XOR'ing continues in Buffer at the beginning of the pad buffer (wrap around).

Also read Section 2.11, "Encryption", in the CSC User's Manual ([CSC_USR.PDF](#)).

EXAMPLE (C/C++)

```
char *Temp = "Hello";  
// write 5 bytes of data  
Code = cscCryptoPutData(DataSock, (char *)Temp, 5,  
                        (char *)PadChars, PadLen);
```

EXAMPLE (VB)

```
Dim Temp As String  
Temp = "Hello"  
' write 5 bytes of data  
Code = cscCryptoPutData(DataSock, Temp, 5, PadChars, PadLen)
```

RETURNS

```
< 0 : Error. See error list.  
>= 0 : Number of bytes written.
```

2.17 cscCryptoPutFile :: Transmits an Encrypted File.

SYNTAX

cscPutFile (vSock, FileName, PadChars, PadLen)

vSock : (I) Virtual (data) socket number.
FileName : (P) Filename (not path) to transmit.
PadChars : (P) Buffer of "pad" bytes.
PadLen : (I) Length of above 'pad' buffer.

REMARKS

The **cscCryptoPutFile** function is used to transmit an encrypted file from an established connection transmitted to the **cscCryptoGetFile** function.

The bytes in 'Buffer' are XOR'ed with the bytes in 'PadChars' before sending. If PadLen < BufLen, the XOR'ing continues in Buffer at the beginning of the pad buffer (wrap around).

Call **cscCryptoPutFile** with a filename to specify the file to be sent, then call **cscCryptoPutFile** repeatedly in a loop until 0 is returned.

The outgoing data stream will contain the filename and the length of the file, followed by the (binary) file itself.

Also see **cscSetString**(-1, CSC_SET_FILE_PATH, ...) to specify the file directory from which the file will be read.

Also read Section 2.11, "Encryption", in the CSC User's Manual ([CSC_USR.PDF](#)).

EXAMPLE (C/C++)

```
// prepare to transmit encrypted file "MyFile.zip" to the remote
Code = cscCryptoPutFile(DataSock, (char *) "MyFile.zip", (char *) PadChars,
                        PadLen);
// transmit file
while(Code!=0) Code = cscCryptoPutFile(DataSock, NULL,
                                       (char *) PadChars, PadLen));
```

EXAMPLE (VB)

```
Dim Filename As String
Filename = "MyFile.zip"
' prepare to transmit file "MyFile.zip" to the remote
Code = cscCryptoPutFile(DataSock, Filename, PadChars, PadLen)
' transmit file
While Code <> 0
    Code = cscCryptoPutFile(DataSock, Chr(0), PadChars, PadLen)
```

RETURNS

< 0 : Error. See error list.
>= 0 : No error.

2.18 **cscCryptoPutFileExt** :: Transmits an Encrypted File (Extended).

SYNTAX

```
cscPutFileExt (vSock, FileName, PadChars, PadLen)
```

```
vSock      : (I) Virtual (data) socket number.  
FileName   : (P) Filename (not path) to transmit.  
PadChars   : (P) Buffer of "pad" bytes.  
PadLen     : (I) Length of above 'pad' buffer.
```

REMARKS

The **cscCryptoPutFileExt** function is used to transmit an encrypted file from an established connection transmitted to the **cscCryptoGetFileExt** function. If the file exists on the receiver and has the same size as on the sender, the file is not sent again.

The bytes in 'Buffer' are XOR'ed with the bytes in 'PadChars' before sending. If PadLen < BufLen, the XOR'ing continues in Buffer at the beginning of the pad buffer (wrap around).

Call **cscCryptoPutFileExt** with a filename to specify the file to be sent, then call **cscCryptoPutFile** repeatedly in a loop until 0 is returned.

The **cscCryptoPutFileExt** function transfers only that part of the specified file that has not already been transferred. If only part of a file is transferred (because of a network or computer malfunction), the function will resume the file transfer without having to send the entire file over again.

The outgoing data stream will contain the filename and the length of the file, followed by the (binary) file itself.

Also see **cscSetString**(-1, CSC_SET_FILE_PATH, ...) to specify the file directory from which the file will be read.

Also read Section 2.11, "Encryption", in the CSC User's Manual ([CSC_USR.PDF](#)).

EXAMPLE (C/C++)

```
// prepare to transmit encrypted file "MyFile.zip" to the remote  
Code = cscCryptoPutFileExt(DataSock, (char *)"MyFile.zip",  
                           (char *)PadChars, PadLen);  
  
// transmit file  
while(Code!=0) Code = cscCryptoPutFileExt(DataSock, NULL,  
                                           (char *)PadChars, PadLen);
```

EXAMPLE (VB)

```
Dim Filename As String  
Filename = "MyFile.zip"  
' prepare to transmit file "MyFile.zip" to the remote  
Code = cscCryptoPutFileExt(DataSock, Filename, (char *)PadChars, PadLen);  
' transmit file  
While Code <> 0  
    Code = cscCryptoPutFileExt(DataSock, Chr(0), PadChars, PadLen)
```

RETURNS

```
< 0 : Error. See error list.  
>= 0 : No error.
```

2.19 cscCryptoPutPacket :: Transmits an Encrypted Packet.

SYNTAX

`cscCryptoPutPacket(vSock, Buffer, BufLen, PadChars, PadLen)`

`vSock` : (I) Virtual (data) socket number.
`Buffer` : (P) Data to write.
`BufLen` : (I) Length of above buffer (# bytes to write).
`PadChars` : (P) Buffer of "pad" bytes.
`PadLen` : (I) Length of above 'pad' buffer.

REMARKS

The **cscCryptoPutPacket** function is used to write (transmit) an encrypted data packet to an established connection.

Packets can vary from 1 to 10,000 bytes in length. **cscCryptoPutPacket** will not return until the entire packet has been queued for transmission.

The bytes in 'Buffer' are XOR'ed with the bytes in 'PadChars' before sending. If `PadLen < BufLen`, the XOR'ing continues in Buffer at the beginning of the pad buffer (wrap around).

Also read Section 11, "Encryption", Section 2.8, "Stream Data I/O" and Section 2.9, "Packet Data I/O" in the CSC User's Manual ([CSC_USR.PDF](#)).

EXAMPLE (C/C++)

```
char *Temp = "Hello";
// write 5 bytes of data
Code = cscCryptoPutPacket(DataSock, (char *)Temp, 5,
                          (char *)PadChars, PadLen);
```

EXAMPLE (VB)

```
Dim Temp As String
Temp = "Hello"
' write 5 bytes of data
Code = cscCryptoPutPacket(DataSock, Temp, 5, PadChars, PadLen)
```

RETURNS

< 0 : Error. See error list.
>= 0 : Number of bytes written.

2.20 `cscDataCRC` :: Compute CRC of Data Buffer.

SYNTAX

```
cscDataCRC(InitCRC, Buffer, BufLen)
```

```
InitCRC    : (I) Initial value of CRC.  
Buffer     : (P) Data to write.  
BufLen     : (I) Length of above buffer (# bytes to write).
```

REMARKS

The `cscDataCRC` function is used to compute the 32-bit cyclic redundancy check (CRC) word of the passed buffer.

EXAMPLE (C/C++)

```
ULONG CRC;           // CRC  
char *Buffer = "ABC"; // data buffer  
CRC = cscDataCRC(0L, Buffer, 3);
```

EXAMPLE (VB)

```
Dim CRC As Long  
Dim Buffer As String  
Buffer = "ABC"  
CRC = cscDataCRC(0L, Buffer, 3)
```

RETURNS

```
= 0 : Error.  
Else : CRC
```

2.21 `cscDataMessage` :: Sends Windows Message (on Data Ready).

SYNTAX

```
cscDataMessage(Handle, vSock, Message)
```

```
Handle   : (I) Windows Handle
vSock    : (I) Virtual data socket.
Message  : (I) Message (usually WM_USER)
```

REMARKS

The `cscDataMessage` function sends a Windows message to the window with handle 'Handle' when data is ready to be read from the other side (client or server).

Refer to the windows client example programs.

EXAMPLE (C/C++)

```
// Send WM_USER message when data is ready to be read
cscDataMessage((long)hMainWnd, DataSock, WM_USER);
```

EXAMPLE (VB)

```
Const WM_LBUTTONDOWN = &H201
' send WM_LBUTTONDOWN message when data is ready to be read
Code = cscDataMessage(Client.bReady.hWnd, DataSock, WM_LBUTTONDOWN)
```

RETURNS

```
< 0 : Error. See error list.
>= 0 : No error.
```

2.22 **cscErrorText** :: Gets Text of Error Message.

SYNTAX

```
cscErrorText(ErrCode, Buffer, BufLen)
```

```
ErrCode  : (I) Error code returned from a CSC function.  
Buffer   : (P) Buffer into which to copy text.  
BufLen   : (I) Length of above buffer.
```

REMARKS

The **cscErrorText** function is used to get the text of an error message associated with the error code returned from a CSC function.

Refer to the example programs.

EXAMPLE (C/C++)

```
char Buffer[128];  
// get error text associated with error 'ErrCode'  
Code = cscError(ErrCode, (char *)Buffer, 128);
```

EXAMPLE (VB)

```
Dim Buffer As String * 128  
' get error text associated with error 'ErrCode'  
Code = cscError(ErrCode, Buffer, 128)
```

RETURNS

```
< 0 : Error. See error list.  
>= 0 : Number of characters copied to Buffer.
```

2.23 cscFileCRC :: Compute CRC of File.

SYNTAX

```
cscFileCRC(Pathname)
```

Pathname: (I) Pathname of file.

REMARKS

The **cscFileCRC** function is used to compute the 32-bit cyclic redundancy check (CRC) word of a file.

EXAMPLE (C/C++)

```
ULONG CRC;  
CRC = cscFileCRC((char *)"\\csc4c\\apps\\csc.h");
```

EXAMPLE (VB)

```
Dim CRC As LONG  
Dim Pathname As String  
Pathname = "\\csc4c\\apps\\csc.h"  
CRC = cscFileCRC(Pathname);
```

RETURNS

```
= 0 : Error.  
Else : CRC
```

2.24 **cscFillRandom** :: Fill Buffer With Random Bytes.

SYNTAX

```
cscFillRandom(PadChars, PadLen, Seed)
```

```
PadChars : (P) Buffer of "pad" bytes.  
PadLen   : (I) Length of above 'pad' buffer.  
Seed     : (I) Random number seed.
```

REMARKS

The **cscFillRandom** function fills the PadChars buffer with 8-bit bytes generated from a pseudo random number generator using the passed Seed value as the seed. Passing a seed of zero will direct **cscFileRandom** to use a randomly generated seed.

This function provides an easy way to populate the PadChars buffer used by the crypto functions. The passed (32-bit) seed is the password.

Also read Section 2.11, "Encryption", in the CSC User's Manual ([CSC_USR.PDF](#)).

EXAMPLE (C/C++)

```
char PadChars[1024];  
Code = cscFillRandom((char *)PadChar, 1024, 1234567);
```

EXAMPLE (VB)

```
Dim PadChars As String * 1024  
Code = cscFillRandom(PadChar, 1024, 1234567)
```

RETURNS

```
< 0 : Error. See error list.  
>= 0 : Number of characters copied to the PadChars buffer.
```

2.25 cscGetData :: Receives Data.

SYNTAX

```
cscGetData(vSock, Buffer, BufLen)
```

```
vSock   : (I) Virtual (data) socket.  
Buffer  : (P) Buffer into which to copy bytes.  
BufLen  : (I) Length of above buffer.
```

REMARKS

The **cscGetData** function is used to receive data from an established connection. All available data is copied to 'Buffer' up to a maximum of 'BufLen'. **cscGetData** never waits for data.

Because TCP is stream oriented, data sent in one network write may not be received in one network read.

EXAMPLE (C/C++)

```
char Temp[128];  
// read data (up to 128 bytes)  
Code = cscGetData(DataSock, (char *)Temp, 128);
```

EXAMPLE (VB)

```
Dim Temp As String * 128  
' read data (up to 128 bytes)  
Code = cscGetData(DataSock, Temp, 128)
```

RETURNS

```
< 0 : Error. See error list.  
>= 0 : Number of bytes copied to Buffer.
```

2.26 cscGetFile :: Receives a File.

SYNTAX

```
cscGetFile(vSock, FileName)
```

```
vSock      : (I) Virtual (data) socket number.  
Filename   : (P) Filename (not path) used to save incoming file or NULL.
```

REMARKS

The **cscGetFile** function is used to receive a file from an established connection transmitted from the **cscPutFile** function.

Specify the filename under which the file is to be saved, or specify an asterisk (“*”) to save under the filename sent with the file. Then call **cscGetFile** repeatedly in a loop until 0 is returned.

The incoming data stream will contain the filename and the length of the file, followed by the (binary) file itself. The filename can be recovered by use of the **cscGetString** function and the file length can be recovered by use of the **cscGetInteger** function.

Also see **cscSetString**(-1, CSC_SET_FILE_PATH, ...) to specify the file directory into which the file is to be saved.

EXAMPLE (C/C++)

```
// prepare to receive file, saving to disk  
Code = cscGetFile(DataSock, (char *)"*");  
// receive file in 4K blocks  
while(Code!=0) Code = cscGetFile(DataSock, NULL);
```

EXAMPLE (VB)

```
' prepare to receive file, saving to disk  
X = "*" + Chr(0)  
Code = cscGetFile(DataSock, X)  
// receive file in 4K blocks  
EmptyString = Chr(0)  
While Code <> 0  
    Code = cscGetFile(DataSock, EmptyString)
```

RETURNS

```
< 0 : Error. See error list.  
>= 0 : No error.
```

2.27 **cscGetFileExt** :: Receives a File (Extended).

SYNTAX

```
cscGetFileExt(vSock, FileName)
```

```
vSock      : (I) Virtual (data) socket number.  
FileName   : (I) T: setup, F: send data packets.
```

REMARKS

The **cscGetFileExt** function is used to receive a file from an established connection transmitted from the **cscPutFileExt** function. If the file exists on the receiver and has the same size as on the sender, the file is not sent again.

Specify the filename under which the file is to be saved, or specify an asterisk (“*”) to save under the filename sent with the file. Then call **cscGetFileExt** repeatedly in a loop until 0 is returned.

The incoming data stream will contain the filename and the length of the file, followed by the (binary) file itself. The filename can be recovered by use of the **cscGetString** function and the file length can be recovered by use of the **cscGetInteger** function.

The **cscGetFileExt** function transfers only that part of the specified file that has not already been transferred. If only part of a file is transferred (because of a network or computer malfunction), the function will resume the file transfer without having to send the entire file over again.

Also see **cscSetString**(-1, CSC_SET_FILE_PATH, ...) to specify the file directory into which the file is to be saved.

EXAMPLE (C/C++)

```
// prepare to receive file, saving to disk  
Code = cscGetFileExt(DataSock, 1);  
// receive file in 4K blocks  
while(Code!=0) Code = cscGetFileExt(DataSock, 0);
```

EXAMPLE (VB)

```
' prepare to receive file, saving to disk  
Code = cscGetFileExt(DataSock, 1)  
' receive file in 4K blocks  
While Code <> 0  
    Code = cscGetFileExt(DataSock, 0)
```

RETURNS

```
< 0 : Error. See error list.  
>= 0 : No error.
```


2.28 `cscGetInteger` :: Returns CSC Numeric Parameter with Client/Server processing information.

SYNTAX

```
cscGetInteger(vSock, ParmName)
```

```
vSock      : (I) Virtual socket number or -1.  
ParmName  : (I) Parameter name.
```

REMARKS

The `cscGetInteger` function is used to get integer parameters from the DLL.

```
CSC_GET_VERSION      : Get version number (vSock = -1)  
CSC_GET_BUILD       : Get build number (vSock = -1)  
CSC_GET_BUFFER_SIZE : Get file buffer size used by cscGetFile & cscPutFile.  
CSC_GET_DAYS_LEFT   : Get the number days left in the evaluation period.  
CSC_GET_SOCKET_ERROR : Get socket error number.  
CSC_GET_SOCKET      : Get actual TCP/IP socket number being used.  
CSC_GET_FILE_LENGTH : Get file length after receiving file (cscGetFile)  
CSC_GET_MAX_PACKET_SIZE : Get maximum packet size.
```

EXAMPLE (C/C++)

```
int Version;  
// get CSC version number  
Version = cscGetInteger(-1, CSC_GET_VERSION);
```

EXAMPLE (VB)

```
Dim Version As Integer  
' get CSC version number  
Version = cscGetInteger(-1, CSC_GET_VERSION)
```

RETURNS

```
< 0 : Error. See error list.  
>= 0 : Requested parameter.
```

2.29 cscGetPacket :: Receives a Packet.

SYNTAX

```
cscGetPacket(vSock, Buffer, BufLen)
```

```
vSock    : (I) Virtual (data) socket.  
Buffer   : (P) Buffer into which to copy bytes.  
BufLen   : (I) Length of above buffer.
```

REMARKS

The **cscGetPacket** function is used to receive the next packet from an established connection. The next packet is copied to 'Buffer' up to a maximum of 'BufLen'. **cscGetPacket** waits for a maximum of 10 seconds (default) for the next packet..

Packets can vary from 1 to 10,000 bytes in length. **cscGetPacket** will not return until the entire packet has been received.

Also read Section 2.8, "Stream Data I/O" and Section 2.9, "Packet Data I/O" in the CSC User's Manual ([CSC_USR.PDF](#)).

EXAMPLE (C/C++)

```
char Temp[128];  
// read data (up to 128 bytes)  
Code = cscGetPacket(DataSock, (char *)Temp, 128);
```

EXAMPLE (VB)

```
Dim Temp As String * 128  
' read data (up to 128 bytes)  
Temp = Space(128)  
Code = cscGetPacket(DataSock, Temp)
```

RETURNS

```
< 0 : Error. See error list.  
>= 0 : Number of bytes copied to Buffer (packet size).
```

2.30 `cscGetString` :: Returns CSC String Parameter with Client/Sever Processing Information.

SYNTAX

```
cscGetString(vSock, ParmName, Buffer, BufLen)
```

```
vSock      : (I) Virtual socket number or -1.  
ParmName   : (I) Parameter name.  
Buffer     : (P) Buffer into which to copy text.  
BufLen     : (I) Length of above buffer.
```

REMARKS

The `cscGetString` function is used to get string (text) parameters from the DLL.

```
CSC_GET_REGISTRATION      : Get registration string.  
CSC_GET_FILE_NAME        : Get filename after receiving file (cscGetFile).  
CSC_GET_REMOTE_SERVER_IP : Get IP address in dotted notation of remote server.  
CSC_GET_REMOTE_CLIENT_IP : Get IP address in dotted notation of remote client.  
CSC_GET_LOCAL_IP         : Get local IP address in dotted notation.  
CSC_GET_COMPUTER_NAME    : Get name of local computer.
```

EXAMPLE (C/C++)

```
// get registration string  
char RegString[128];  
Code = cscGetString(vSock, CSC_GET_REGISTRATION, (char *)RegString, 128)
```

RETURNS

```
< 0 : Error. See error list.  
>= 0 : Number of characters copied to Buffer.
```

2.31 `cscGetUDP` :: Reads UDP Datagram.

SYNTAX

```
cscGetUDP(vSock, Buffer, BufLen, Host)
```

```
vSock : (I) Virtual UDP socket.  
Buffer : (I) Buffer into which datagram is to be copied.  
BufLen : (I) Size of buffer.  
Host : (P) Host name or IP address (dotted format).
```

REMARKS

The `cscGetUDP` function reads an incoming UDP datagram. `cscCreateUDP` must be called first to get a UDP socket.

Refer to the `uEcho_S` (UDP server) and `uEcho_C` (UDP client) example programs.

EXAMPLE (C/C++)

```
// Read UDP socket into 'Buffer'  
BytesRead = cscGetUDP(vSock, (char *)Buffer, BufSize, (char *)Host);
```

EXAMPLE (VB)

```
' Read UDP socket into 'Buffer'  
BytesRead = cscGetUDP(vSock, Buffer, Host)
```

RETURNS

```
< 0 : Error. See error list.  
>= 0 : No error.
```

2.32 **cscIsConnected**:: Returns the Current Connection Status.

SYNTAX

```
cscIsConnected(vSock)
```

```
    vSock : (I) Virtual socket number.
```

REMARKS

The **cscIsConnected** function is used determine the current connection status.

Awaiting incoming socket data (**cscAwaitData**), reading socket data (**cscGetData**), and writing socket data (**cscPutData**) will all return an error code if the socket connection has been dropped.

EXAMPLE (C/C++)

```
//test connection
if(!cscIsConnected(vSock))
    {printf("*** ERROR: Connection has been dropped!\n");
    break;
    }
```

EXAMPLE (VB)

```
Dim vSock As Long
If cscIsConnected(vSock) <> 0 Then
    Result.Text = "*** ERROR: Connection has been dropped!"
End If
```

RETURNS

```
True   : Connective is OK.
False  : Connection has been dropped.
```

2.33 cscMakeDotted :: Create Dotted IP String From IP Address

SYNTAX

```
cscMakeDotted(Addr, Buffer, BufLen)
```

```
Addr      : (L) 32-bit IP address.  
Buffer    : (P) Buffer into which to copy dotted address.  
BufLen   : (I) Length of above buffer.
```

REMARKS

The **cscMakeDotted** function is used to create a dotted text version of the specified IP address.

EXAMPLE (C/C++)

```
ULONG Addr;  
Addr = cscResolve((char *)"www.marshallsoft.com", 0);  
// construct dotted decimal equivalent string  
if(Addr) cscMakeDotted(Addr, (char *)Temp, 64);
```

EXAMPLE (VB)

```
Dim Addr As Long  
Dim X As String  
Dim Temp As String  
X = www.marshallsoft.com  
Addr = cscResolve(X, 0)  
' construct dotted decimal equivalent string  
If Addr <> 0 Then  
    Temp = Space(20)  
    cscMakeDotted(Addr, Temp, 20)
```

RETURNS

```
< 0 : Error. See error list.  
>= 0 : IP address in dotted decimal notation (e.g.: "10.0.0.1")
```

2.34 cscMakeDotted4 :: Create Dotted IP String From IP Components

SYNTAX

```
cscMakeDotted(Byte1, Byte2, Byte3, Byte4, Buffer, BufLen)
```

```
Byte1   : (L) First IP address Byte [0..255]  
Byte2   : (L) First IP address Byte [0..255]  
Byte3   : (L) First IP address Byte [0..255]  
Byte4   : (L) First IP address Byte [0..255]  
Buffer  : (P) Buffer into which to copy dotted address.  
BufLen  : (I) Length of above buffer.
```

REMARKS

The **cscMakeDotted4** function is used to create a dotted text version of the specified IP address as specified by 4 Bytes.

EXAMPLE (C/C++)

```
int Byte1 = 10;  
int Byte2 = 0;  
int Byte3 = 0,  
int Byte4 = 1;  
// construct dotted decimal equivalent string "10.0.0.1"  
cscMakeDotted2(Byte1, Byte2, Byte3, Byte4, (char *)Temp, 64);
```

EXAMPLE (VB)

```
Dim Byte1 As Integer  
Dim Byte2 As Integer  
Dim Byte3 As Integer  
Dim Byte4 As Integer  
Dim X As String  
Dim Temp As String  
Byte1 = 10  
Byte2 = 0  
Byte3 = 0  
Byte4 = 1  
' construct dotted decimal equivalent string "10.0.0.1"  
X = Space(20)  
Code = cscMakeDotted4(Byte1, Byte2, Byte3, Byte4, Temp, 20)
```

RETURNS

```
< 0 : Error. See error list.  
>= 0 : IP address in dotted decimal notation (e.g., "10.0.0.1")
```

2.35 **cscMulticast** :: Sets multicast address

SYNTAX

```
cscMulticast(vSock, MultiIP)
```

vSock : (I) Virtual (data) socket number.

MultiIP : (I) Multicast IP address

REMARKS

The **cscMulticast** function sets the multicast IP address for receiving UDP packets.

To send a multicast datagram, specify an IP multicast address using 239.255.x.y as the destination address. The receiving program should call **cscMulticast()** to set up the multicast address. **cscMulticast()** is NOT called to send packets.

EXAMPLE (C/C++)

```
    MulticastIP = cscResolve(MULTICAST_IP, 0);  
    Code = cscMulticast(vSock, MulticastIP);
```

EXAMPLE (VB)

```
    MulticastIP = cscResolve(MULTICAST_IP, 0)  
    Code = cscMulticast(vSock, MulticastIP)
```

RETURNS

< 0 : Error. See error list.

>= 0 : No error.

2.36 **cscNetToHost32** :: Converts a 32-bit integer to host byte order

SYNTAX

`cscNetToHost32(Integer)`

`Integer` : (I) 32-bit integer in network byte order.

REMARKS

The **cscNetToHost32** program converts a 32-bit integer from network byte order to host byte order. For example, the Network Time Server protocol returns an integer in network byte order that must be converted to host byte order.

EXAMPLE (C/C++)

```
// convert to host byte order
HostInteger = cscNetToHost(NetInteger);
```

EXAMPLE (VB)

```
' convert to host byte order
HostInteger = cscNetToHost(NetInteger);
```

RETURNS

32-bit integer in host byte order.

2.37 `cscPutData` :: Transmits Data.

SYNTAX

```
cscPutData(vSock, Buffer, BufLen)
```

```
vSock      : (I) Virtual (data) socket number.  
Buffer     : (P) Data to write.  
BufLen    : (I) Length of above buffer (# bytes to write).
```

REMARKS

The `cscPutData` function is used to write (transmit) a buffer to an established connection.

Because TCP is stream oriented, data sent in one network write may not be received in one network read.

EXAMPLE (C/C++)

```
char *Temp = "Hello";  
// write 5 bytes of data  
Code = cscPutData(DataSock, (char *)Temp, 5);
```

EXAMPLE (VB)

```
Dim Temp As String  
Temp = "Hello"  
' write 5 bytes of data  
Code = cscPutData(DataSock, Temp, 5)
```

RETURNS

```
< 0 : Error. See error list.  
>= 0 : Number of bytes written.
```

2.38 **cscPutFile** :: Transmits a File.

SYNTAX

```
cscPutFile(vSock, FileName)
```

```
vSock      : (I) Virtual (data) socket number.  
FileName  : (P) Filename (not path) to transmit.
```

REMARKS

The **cscPutFile** function is used to transmit a file from an established connection transmitted to the **cscGetFile** function.

Call **cscPutFile** with a filename to specify the file to be sent, then call **cscPutFile** repeatedly in a loop until 0 is returned.

The outgoing data stream will contain the filename and the length of the file, followed by the (binary) file itself.

Also see **cscSetString**(-1, CSC_SET_FILE_PATH, ...) to specify the file directory from which the file will be read.

EXAMPLE (C/C++)

```
// prepare to transmit file "MyFile.zip" to the remote  
Code = cscPutFile(DataSock, (char *)"MyFile.zip");  
// transmit file in 4K blocks  
while(Code!=0) Code = cscPutFile(DataSock, NULL);
```

EXAMPLE (VB)

```
Dim Filename As String  
Filename = "MyFile.zip"  
' prepare to transmit file "MyFile.zip" to the remote  
Code = cscPutFile(DataSock, Filename)  
' transmit file in 4K blocks      While Code <> 0  
Code = cscPutFile(DataSock, Chr(0))
```

RETURNS

```
< 0 : Error. See error list.  
>= 0 : No error.
```

2.39 **cscPutFileExt** :: Transmits a File (Extended).

SYNTAX

```
cscPutFileExt(vSock, FileName)
```

```
vSock      : (I) Virtual (data) socket number.  
FileName  : (P) Filename (not path) to transmit.
```

REMARKS

The **cscPutFileExt** function is used to transmit a file from an established connection transmitted to the **cscGetFileExt** function. If the file exists on the receiver and has the same size as on the sender, the file is not sent again.

Call **cscPutFileExt** with a filename to specify the file to be sent, then call **cscPutFileExt** repeatedly in a loop until 0 is returned.

The outgoing data stream will contain the filename and the length of the file, followed by the (binary) file itself.

The **cscPutFileExt** function transfers only that part of the specified file that has not already been transferred. If only part of a file is transferred (because of a network or computer malfunction), the function will resume the file transfer without having to send the entire file over again.

Also see **cscSetString**(-1, CSC_SET_FILE_PATH, ...) to specify the file directory from which the file will be read.

EXAMPLE (C/C++)

```
// prepare to transmit file "MyFile.zip" to the remote  
Code = cscPutFileExt(DataSock, (char *)"MyFile.zip");  
// transmit file in 4K blocks  
while(Code!=0) Code = cscPutFileExt(DataSock, NULL);
```

EXAMPLE (VB)

```
Dim Filename As String  
Filename = "MyFile.zip"  
' prepare to transmit file "MyFile.zip" to the remote  
Code = cscPutFileExt(DataSock, Filename)  
' transmit file in 4K blocks  
While Code <> 0  
    Code = cscPutFileExt(DataSock, Chr(0))
```

RETURNS

```
< 0 : Error. See error list.  
>= 0 : No error.
```

2.40 cscPutPacket :: Transmits a Packet.

SYNTAX

cscPutPacket(vSock, Buffer, BufLen)

vSock : (I) Virtual (data) socket number.
Buffer : (P) Data to write.
BufLen : (I) Length of above buffer (# bytes to write).

REMARKS

The **cscPutPacket** function is used to write (transmit) an encrypted data packet to an established connection.

Packets can vary from 1 to 10,000 bytes in length. **cscPutPacket** will not return until the entire packet has been queued for transmission.

Also read Section 2.8, “Stream Data I/O” and Section 2.9, “Packet Data I/O” in the CSC User’s Manual ([CSC_USR.PDF](#)).

EXAMPLE (C/C++)

```
char *Temp = "Hello";  
// write 5 bytes of data  
Code = cscPutPacket(DataSock, (char *)Temp, 5);
```

EXAMPLE (VB)

```
Dim Temp As String  
Temp = "Hello"  
' write 5 bytes of data  
Code = cscPutPacket(DataSock, Temp, 5)
```

RETURNS

< 0 : Error. See error list.

2.41 `cscPutUDP` :: Writes UDP Socket.

SYNTAX

```
cscPutUDP(vSock, Buffer, BufLen, RemoteIP, RemotePort)
```

```
vSock      : (I) Virtual UDP socket.  
Buffer     : (I) Buffer into which datagram is to be copied.  
BufLen     : (I) Size of buffer.  
RemoteIP   : (I) Remote IP address (32-bit address)  
RemotePort : (P) Remote port.
```

REMARKS

The `cscPutUDP` function writes a UDP datagram. `cscCreateUDP` must be called first to get a UDP socket.

Refer to the `uEcho_S` (UDP server) and `uEcho_C` (UDP client) example programs.

EXAMPLE (C/C++)

```
// Write UDP socket from 'Buffer'  
BytesWritten = cscPutUDP(vSock, (char *)Buffer, BufSize, RemoteIP);
```

EXAMPLE (VB)

```
' Read UDP socket into 'Buffer'  
BytesRead = cscPutUDP(vSock, Buffer, Host)
```

RETURNS

```
< 0 : Error. See error list.  
>= 0 : No error.
```

2.42 **cscReadSize** :: Returns the Number of Bytes Ready to be Read.

SYNTAX

```
cscReadSize(vSock)
```

vSock : (I) Virtual (data) socket number.

REMARKS

The **cscReadSize** function is used to get the number of bytes ready to be read from the socket.

EXAMPLE (C/C++)

```
int Bytes;
// get # bytes ready to be read
Bytes = cscReadSize(vSock);
```

EXAMPLE (VB)

```
Dim Bytes As Integer
' get # bytes ready to be read
Bytes = cscReadSize(vSock)
```

RETURNS

< 0 : Error. See error list.
>= 0 : Number of bytes ready to be read.

2.43 **cscRelease** :: Releases DLL.

SYNTAX

```
cscRelease()
```

REMARKS

The **cscRelease** function is used to release CSC32.DLL or CSC64.DLL and should be the last CSC function called.

EXAMPLE (C/C++)

```
int Code;  
// release CSC32.DLL  
Code = cscRelease();
```

EXAMPLE (VB)

```
Dim Code As Integer  
' release CSC32.DLL  
Code = cscRelease()
```

RETURNS

< 0 : Error. See error list.
>= 0 : No error.

2.44 **cscResolve** :: Resolves Host Name into IP Address.

SYNTAX

```
cscResolve(HostName, HostIndex)
```

```
HostName : (P) Server name or IP address (in dotted notation).  
HostIndex : (I) Server index (if multi-homed).
```

REMARKS

The **cscResolve** function is used to resolve a host name to an IP address by calling DNS (Domain Name Services).

EXAMPLE (C/C++)

```
ULONG Addr;  
// resolve host name into an IP address.  
Addr = cscResolve((char *)"www.marshallsoft.com", 0);
```

EXAMPLE (VB)

```
Dim Addr As Long  
Dim URL As String  
URL = "www.marshallsoft.com"  
' resolve host name into an IP address.  
Addr = cscResolve(URL, 0)
```

RETURNS

```
< 0 : Error. See error list.  
>= 0 : IP address.
```

2.45 `cscResponse` :: Constructs Response String.

SYNTAX

```
cscResponse(ChallStr,Multi,Mask,Rotate,Response)

ChallStr : (P) 8 character challenge string (in hex)
Mult     : (I) 32-bit multiplier
Mask     : (I) 32-bit mask value
Rotate   : (I) Left rotate count (0 to 31)
Response : (P) Buffer for response string
```

REMARKS

The `cscResponse` function constructs the correct response string for the given challenge string.

The purpose of the `cscChallenge` and `cscResponse` functions is to create a challenge / response protocol in order to defeat hackers who may try to connect to your server.

The arguments to the `cscResponse` function define the mapping from the 8-byte challenge string to the 8-byte response string. Each developer should choose unique values for his application.

Also see `cscChallenge`, which constructs the random challenge string.

EXAMPLE (C/C++)

```
char Challenge[9];           // challenge string
char Response[9];           // response string
ULONG Multiplier = 321;     // 32-bit multiplier
ULONG Mask = 0x1a2b3c4d;    // 32-bit mask value
int RotateCount = 3;        // left rotate count (0 to 31)
// compute correct response for the challenge number
Code = cscResponse((char *)Challenge, Multiplier, Mask,
                  RotateCount, (char *)Response);
```

EXAMPLE (VB)

```
Dim Challenge As String
Dim Response As String * 9
Dim Multiplier As Integer
Dim Mask As Long
Dim RotateCount As Integer
Multiplier = 321
Mask = &H1a2b3c4d
RotateCount = 3
// compute correct response for the challenge number
Code = cscResponse(Challenge, Multiplier, Mask, RotateCount, Response)
```

RETURNS

< 0 : Error. See error list.
>= 0 : No error.

2.46 `cscServer` :: Starts the Server.

SYNTAX

```
cscServer(ServerName, ServerPort, MaxConnect)
```

```
ServerName : (P) Server name or IP address, or NULL.  
ServerPort : (I) Server port to listen on.  
MaxConnect : (I) Maximum number of connections to accept.
```

REMARKS

The `cscServer` function is used to accept a connection from a client. Up to 'MaxConnect' connections can be accepted by the server concurrently.

Specify the server name or IP address (in dotted decimal notation) and the port to listen on. Specify NULL or an empty string for ServerName if you want to accept connections on any IP on the local machine.

For server applications, be sure to allocate one listen socket for each port that is to be listened on concurrently.

EXAMPLE (C/C++)

```
HostName = "\\0";  
short HostPort = 5001;  
// start server, accepting a maximum of 1 connection  
Code = cscServer((char *)HostName, (int)HostPort, 1);
```

EXAMPLE (VB)

```
Dim HostName As String  
Dim HostPort As Integer  
HostName = Chr(0)  
HostPort = 5001  
Code = cscServer(HostName, HostPort, 1)
```

RETURNS

```
>= 0 : Listen socket.  
< 0  : Error (See error list)
```

2.47 **cscSetInteger** :: Sets numeric parameter which contains client/server processing information.

SYNTAX

```
cscSetInteger(vSock, ParamName, ParamValue)
```

```
vSock      : (I) Virtual socket number or -1.  
ParamName  : (I) Parameter name.  
ParamValue : (I) Parameter value.
```

REMARKS

The **cscSetInteger** function is used to set an integer parameter in the DLL. Parameter names are:

```
CSC_SET_BLOCKING_MODE : Set blocking mode (connect only). Default = TRUE  
CSC_SET_BUFFER_SIZE   : Set write file size. Default = 10000.  
CSC_SET_SLEEP_TIME    : Set sleep time value when waiting. Default = 100.  
CSC_SET_DEBUG_LEVEL   : Set debug level (0=off, 1=low, 2-high). Default = 0.  
CSC_SET_LINGER        : Set linger time when socket is closed. Default = 200  
CSC_SET_TIMEOUT_VALUE : Set packet timeout. Default = 10000.  
CSC_SET_MAX_PACKET_SIZE : Set maximum packet size. Default = 10000.  
CSC_SET_FILE_OVERWRITE : Sets file overwrite mode. Default = 0.  
CSC_SET_CLOSE_TIMEOUT : Sets maximum time before a socket is forced closed.  
CSC_SET_CONNECT_WAIT  : Sets connection wait timeout. Default = 10.
```

BLOCKING_MODE: The blocking mode (1 = block, 0 = don't block) applies only while connecting.

BUFFER_SIZE: The default file buffer size is 10000, the maximum size is 30000.

SLEEP_TIME: The sleep value (mSec) is used in certain functions to introduce a time delay.

DEBUG_LEVEL: Values are off (0), low (1), and high (2). The default debug level is 0.

LINGER: The linger time (mSec) is the delay after closing a socket to allow any ongoing communications to complete on the socket.

TIMEOUT_VALUE: The timeout-value is used by **cscGetFile** and specified how long to wait for individual fields before giving up.

MAX_PACKET_SIZE: The default packet buffer size is 10000, the maximum size is 30000.

FILE_OVERWRITE: When receiving file, will overwrite existing file if TRUE (not 0).

CSC_SET_CLOSE_TIMEOUT : Sets the maximum time (in milliseconds) before a socket is forced closed (when calling **cscClose**). This function should not be used as a routine matter.

CSC_SET_CONNECT_WAIT: Sets the maximum time (in milliseconds) to wait for a connection to be accepted.

EXAMPLE (C/C++)

```
int Code;  
// set 100 ms sleep time  
Code = cscSetInteger(vSock, CSC_SET_SLEEP_TIME, 100);
```

EXAMPLE (VB)

```
Dim Code As Integer  
' set 100 ms sleep time  
Code = cscSetInteger(vSock, CSC_SET_SLEEP_TIME, 100)
```

2.48 **cscSetString** :: Sets parameter string for file processing.

SYNTAX

```
cscSetString(vSock, ParmName, ParmPtr)

vSock      : (I) Virtual socket number or -1.
ParmName   : (I) Parameter value.
ParmPtr    : (P) Parameter string to set.
```

REMARKS

The **cscSetString** function is used to pass string (text) parameters in the DLL.

Parameter names are as follows (pass vSock = -1).

```
CSC_SET_LOG_FILE   : name of the log file.
CSC_WRITE_TO_LOG   : write string to log file.
CSC_SET_FILE_PATH  : sets path location for cscPutFile and cscGetFile.
```

EXAMPLE (C/C++)

```
int Code;
// set LOG filename
Code = cscSetString (-1, CSC_SET_LOG_FILE, (char *) "MY-PROGRAM.LOG");
```

EXAMPLE (VB)

```
Dim Code As Integer
Dim LogName As String
' set LOG filename
LogName = "MY-PROGRAM.LOG"
Code = cscSetString (-1, CSC_SET_LOG_FILE, LogName)
```

RETURNS

```
< 0 : Error. See error list.
>= 0 : No error.
```

2.49 **cscShortToByte** :: Converts 16-bit ASCII character buffer to 8-bit

SYNTAX

```
cscShortToByte(Buffer)
```

```
    Buffer : (P) character buffer
```

REMARKS

The **cscShortToByte** function converts the (null terminated) character buffer 'Buffer' from 16-bit Unicode ASCII characters to 8-bit ASCII characters.

The buffer must be null terminated (last character is a hex 00).

This function is only necessary when working with 16-bit Unicode ASCII characters in C# and Delphi 2005.

RETURNS

None.

EXAMPLE (C#)

See C# example ClientCS.csproj

```
NameString = "MyFile.zip\0"  
char[] NameBuffer = NameString.ToCharArray();  
// convert (null terminated) 16-unicode buffer to 8-bit  
fixed (char* pNameBuffer = NameBuffer)  
cscShortToByte(pNameBuffer);
```

ALSO SEE

[cscByteToShort](#)

2.50 **cscSleep** :: Sleeps Specified Time.

SYNTAX

```
cscSleep(Milliseconds)
```

Milliseconds : (I) Number of milliseconds to sleep.

REMARKS

The **cscSleep** function sleeps for the indicated number of milliseconds. 'Milliseconds' must be positive.

This function is included in CSC because it is not available in all computer languages.

EXAMPLE (C/C++)

```
// sleep 1 second  
Tics = cscSleep(1000);
```

EXAMPLE (VB)

```
' sleep 1 second  
Tics = cscSleep(1000)
```

RETURNS

1 is always returned.

2.51 `cscSystemTics` :: Returns System Tics Count.

SYNTAX

```
cscSystemTics()
```

REMARKS

The `cscSystemTics` function returns the system tic count, which is the number of milliseconds since the system was booted.

The primary purpose of this function is to time various events.

This function is included in `CSC` because it is not available in all computer languages.

EXAMPLE (C/C++)

```
unsigned long Tics;
// return current system tics
Tics = cscSystemTics();
```

EXAMPLE (VB)

```
Dim Tics As Long
' return current system tics
Tics = cscSystemTics()
```

RETURNS

The number of milliseconds since system bootup.

3 CSC Error Return Code List

The complete list of CSC error codes follows.

3.1 WINSOCK Error Codes

- 10004: Interrupted system call.
- 10009: Bad file number.
- 10013: Access denied.
- 10014: Bad address.
- 10022: Invalid argument.
- 10024: Too many open files.
- 10035: Would block socket in non-blocking mode.
- 10036: Blocking call already in progress.
- 10037: Operation already completed.
- 10038: Not a valid socket
- 10039: Destination address required.
- 10040: Message too big for buffer.
- 10041: Prot mismatch.
- 10042: Prot option invalid.
- 10043: Prot not supported.
- 10044: Socket type not supported.
- 10045: Socket operation not supported.
- 10047: Socket address family not supported.
- 10048: Socket address already in use.
- 10049: Socket address not available.
- 10050: Network error.
- 10051: Cannot reach network.
- 10052: Connection dropped.
- 10053: Connection timed-out or aborted.
- 10054: Connection reset by remote host.
- 10055: Out of buffer space.
- 10056: Socket already connected.
- 10057: Socket not connected.
- 10058: Socket functionality shut down.
- 10060: Timed-out attempting to connect.
- 10061: Connection refused by remote host.
- 10064: Host is down
- 10065: No route to host
- 10091: Network not yet ready.
- 10092: WINSOCK doesn't support requested version.
- 10093: Sockets not initialized. Call WSStartup.
- 11001: Host does not exist.
- 11002: Host not found. Try again.
- 11003: Non-recoverable error has occurred.
- 11004: No data is available.

3.2 CSC Error Codes

- 1: EOF.
- 2: CSC aborted.
- 3: CSC accept error.
- 4: CSC already attached
- 5: Cannot comply.
- 6: No such socket.
- 7: Connect error.
- 8: Listen error.
- 9: No such host.
- 10: CSC not attached.
- 11: NULL argument.
- 12: NULL pointer.
- 13: Cannot allocate memory
- 14: Buffer size error
- 15: Packet CRC error
- 16: Too many sockets.
- 17: No free sockets.
- 18: No such file.
- 19: File format protocol error.
- 20: File name only.
- 21: Packet timeout.
- 22: Packet error.
- 23: Transfer cancelled.
- 24: File too large
- 25: No listen socket
- 26: Argument out of range
- 27: Buffer size too large.
- 28: Connect timeout.
- 29: Packet size error.
- 30: Cannot resolve host.
- 74: Bad key code.

4.3 VSOCK Error Codes

- 1001: No socket address.
- 1002: No free sockets.
- 1003: No such vsock.
- 1004: Bad status flag.
- 1005: Invalid socket.
- 1006: No such parameter.
- 1007: Cannot comply.
- 1008: String size error.
- 1009: No such server.
- 1010: Buffer length error.
- 1011: Connect error.