FTPS provider

FTPS client

Version 1.1.0

User's guide

October 24, 2022

【 remarks 】

This document uses machine translation.

【 revision history 】

Version	Date	Content
1.0.0	2019-02-20	First edition.
1.0.1	2020-01-20	Fixed a bug when handling 1GB files and improved file processing speed. Modify wording.
1.0.2	2020-12-24	Fixed a bug that prevented AddFile from working with FTP servers on UNIX operating systems. Raw command added to Execute method. Added Log option. Modify wording. Changed FTP communication library.
1.0.3	2021-03-12	Fixed a bug that it crashes when the Controller :: Execute method is executed with an empty command name.
	2021-12-31	Added the specification of Path option of Controller :: AddFile method.
1.1.0	2022-10-24	Supports TLS 1.1 and TLS 1.2. Added SecurityProtocol option.

【 hardware 】

Model	Version	Notes

【 Operation check device 】

Model	Version	Notes
IIS FTP	IIS10.0	
Vsftpd	3.0.3	
KEYENCE XG-8000		Since LIST,MDTM,SIZE command is not supported, the date and time of last modification and the file size are obtained from the result of MLSD command.

Contents

1. Introduction

This book is an user's guide of the FTPS provider that is the provider to access the file by using FTP over SSL.

This provider assigns an CaoFile object to an actual file so that CaoFile objects can demonstrate the actual file's tree structure.

This book explains the function of this FTPS provider and the mounting method.

This provider uses an open source library for FTP communication.

[FluentFTP]

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URL: https://github.com/robinrodricks/FluentFTP/blob/master/LICENSE.TXT

.NET Framework 4.7.2 is required to use this provider.

2. Outline of provider

2.1. Outline

The FTPS provider is wrapping the file and the accessed part with the interface of CAO by using FTP over SSL. As a result, it is possible to process it as well as the file that exists in the local without considering that it is on the FTP server.

It is necessary to register by the method of Table 2-1 to use the FTPS provider. RegistAsm.bat and UnregistAsm.bat are in the DotNet¥BAT folder under the folder that installs ORiN2SDK.

Table 2-1 FTPS provider

File name	CaoProvFTPS.dll
ProgID	CaoProv.FTPS
[1]Registry registration	RegistAsm.bat CaoProvFTPS.dll
Blotting out of registry registration	UnregistAsm.bat CaoProvFTPS.dll

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[1] It is not necessary registration/to blot out by hand power when installing it with ORiN SDK.

2.2. Method property

2.2.1. CaoWorkspace::AddController method

   Connect this method with the FTP server with the start of the FTPS provider by specifying connected parameter of the controller name and the FTP server for the argument. The argument specification of this method is shown as follows.

```
AddController
(
"< controller name >"                    // Controller name
 "CaoProv.FTPS ",                         // Provider name. Fixation.
"< option >"                  // Optional character string
)
```

The list specified for an optional character string is shown as follows.

Table 2-2 Optional character string of CaoWorkspace::AddController

Option	Meaning
Server name of =[< Server >]	FTP server name. (default: "localhost")
User=[< user-name >]	User-name to log in FTP server. (default: Null character string)
Password=[< password >]	Password corresponding to user-name. (default: Null character string)
Port=[< port number >]	Port number of FTP. (default: 21) When "0" is specified, automatic judgment mode is set, and it is judged that "21" is specified.

Passive=[<True/False>]	Setting of passive mode.
	    True: Passive mode
	    False: Active mode (default)

SSL=[<True/False>]	Encrypted connection settings.
	    True: SSL/TLS connection (default)
	    False: Connection in clear

SecurityProtocol = [<SSL/TLS used>]	The protocol used to make encrypted connections. Specify the total value of the protocol to be used. If omitted, 15 is assumed. <table><tr><td>Protocol</td><td>Value</td></tr><tr><td>SSL 3.0</td><td>1</td></tr><tr><td>TLS 1.0</td><td>2</td></tr><tr><td>TLS 1.1</td><td>4</td></tr><tr><td>TLS 1.2</td><td>8</td></tr></table>

ReferencePath =[<Standard passing of relative path>]	A standard passing of local PC when the "Download" and "Upload" command is executed is specified. Please refer to each command for details. (P13, P14) (default: Directory where dll of FTPS provider is arranged)

Log=[<True/False>]	Log output settings during FTP communication.
	    True: Log output
	    False: No log output (default)

2.2.2. CaoController::AddFile method

Make the file object in this method. Specify the file that makes them correspond to the object for a file name. The file specified here becomes the root directory of the tree structure formed with the file object. Therefore, it is necessary to specify passing that shows the position of this file in the option. The argument specification of AddFile is shown as follows.

```
AddFile
(
"< file name >"            // File name
"< option >"              // Optional character string
)
```

The list specified for an optional character string is shown as follows.

Table 2-3 Optional character string of CaoController::AddFile

Option	Meaning
Path=< path name >	Passing the directory with the file specified for a file name is described (default: FTP root directory). At this time, the delimiter of passing can use both "¥" and "/". The path should be specified as an absolute path. If a relative path is specified, the AddFile method will fail. Example) When specifying the "Sample" folder directly under the root "Path = /Sample": Success. "Path = Sample": Failed.

@Create[=<0〜3>]	Make the file according to this optional value when there is no specified file.
	  0:Do not make the file. (default)
	  1:Make the file.
	  2:Make the directory.
	  3:Make the file and make the directory if there is no extension if there is an extension.

	When the specified file exists, this option is disregarded. Moreover, when only @Create is specified, it is judged that three was specified.
Mode[=<0〜2>]	Specify the forwarding mode of get_Value and the put_Value property. 0:..automatic setting (details, (default) 1:ASCII mode 2:BINARY mode

Sample

```
Dim engine As caoEngine
Dim workspace As caoWorkspace
Dim ctrl As CaoController
Set engine = New caoEngine
Set workspace = engine.AddWorkspace("NewWrks", "")
Set ctrl = workspace.AddController("sample", _
                        "CaoProv.FTPS", _
                        "", _
                        "Server=FTPServer,User=User,Password=Passwd")

' The route element is added.
Dim root As CaoFile
Set root = ctrl.AddFile("/")

' The child directory is added to CaoController.
Dim childDir As CaoFile
Set childDir = ctrl.AddFile("childDir")

' The grandchild directory is added to CaoController.
Dim grandsonDir As CaoFile
Set grandsonDir = ctrl.AddFile("grandsonDir", "Path=/childDir/grandsonDir")

' The file that doesn't exist is added to the route and it adds it to CaoController.
Dim nonFile As CaoFile
Set nonFile = ctrl.AddFile("nonFile.txt", "@Create")
```

2.2.3. CaoController::Execute method

Execute CaoController extension. Execute is specifi ed as follows.

```
Execute
(
    "<command name>",            // Command name
    "<argument>"                 // Argument
)
```

The following is a list of extended commands that can be specified in Execute. The usage examples are described in detail in the extended commands.

Command	Explanation	Reference
Raw	Sends the string passed in the argument as an FTP command to the server.	P.9

2.2.3.1. Raw command

Send the string passed in the argument as an FTP command. The current directory is the FTP root directory. As a return value, the success/failure of FTP command and the response message at execution time can be retrieved, but the response data such as the file list cannot be retrieved.

Table 2-4 Raw Command Arguments

Item	Type explanation	
Argument	VT_BSTR	Specifies an FTP command string.
Return Value	VT_BOOL	Returns the execution result of the FTP command. TRUE: FTP command executed successfully FALSE: FTP command execution failed
	VT_BSTR	Returns a response message from the FTP server.

2.2.4. CaoFile::AddFile method

The above-mentioned 2.2.2. The file object is similarly made. Only the file in the directory that corresponds to the CaoFile object that executes this method can be specified for a file name. Therefore, the Path option, which is the option in 2.2.2 above, is ignored. It drinks and optional optional Path is disregarded. This method fails in no correspondence of the executed CaoFile object to the directory.

2.2.5. CaoFile::Copy method

Copy it onto the place on the FTP server that specifies the file when you execute this method. Operation changes as shown in Table 2-4 according to the file type that corresponds to the object.

Table 2-4 Operation of Copy method at each correspondence file

Corresponding file	Operation of Copy method
File	It copies a file.
Directory	Copy the directory and the file and the subdirectory in that.
FTP root directory	Return the error without copying it.

The argument specification of Copy is shown as follows.

```
Copy
(
    "< copy destination >",    // At the destination of the copy of the file
    "< option >"               // Optional character string
)
```

Table2-5Optional character string of CaoFile::Copy

Option	Meaning

Overwrite[=<True/False>]	Superscription setting when there is file at copy destination. True: Overwrite. False: A unique name is set by the automatic operation.

2.2.6. Specification method at copy destination

It thinks/TestDir/Test.txt is copied by using the Copy method of the CaoFile object corresponding to the file when the composition of the FTP server connected in the provider is Figure 2-1. When the one of the following conditions is input at the copy destination, the error is returned.

・ When the copy destination and copy source are the same.
・ When the copy destination is a subdirectory of the copy origin.
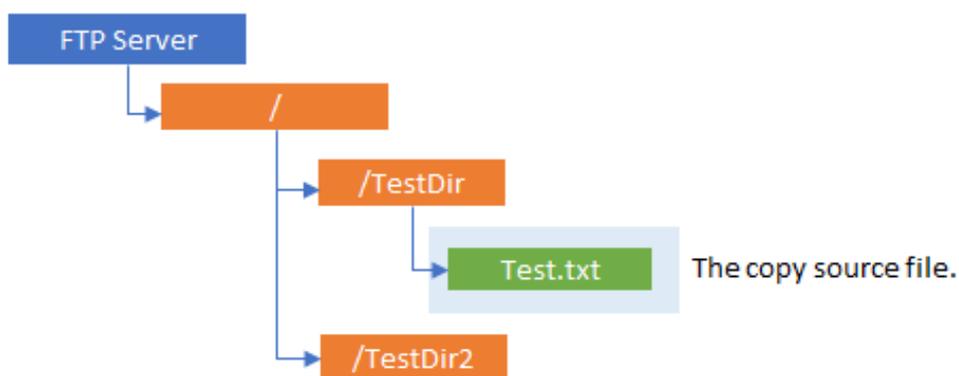
Figure 2-1 Composition of FTP server

2.2.6.1. The copy destination is specified by the absolute path.

It copies it when specifying it by the absolute path by the name specified for the place specified at the copy destination. Figure 2-2 shows the copy result when/TestDir2/Test2.txt is specified at the copy destination.
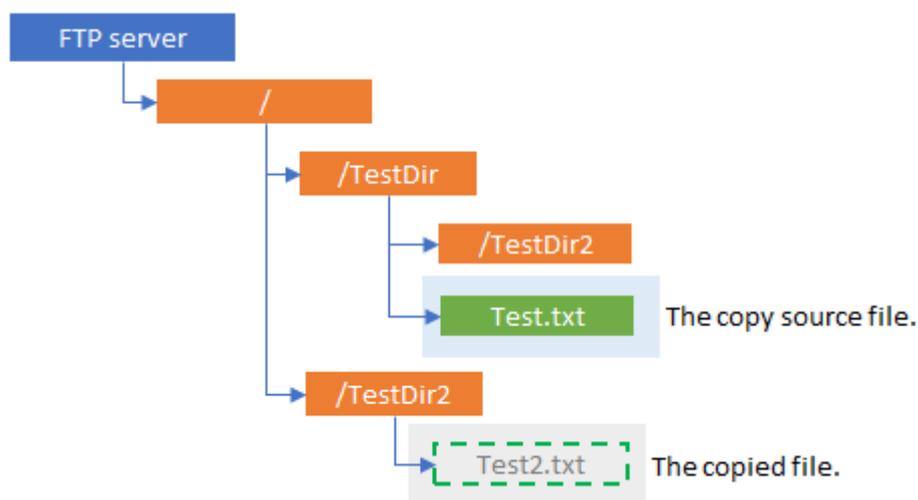
Figure 2-2 Copy result of having specified "/TestDir2/Test2.txt" at copy destination

2.2.6.2. The copy destination is specified by the relative path.

It copies it onto the place based on the directory that includes the file directory of the copy origin. Figure 2-3 : at the copy destination. The copy result when/TestDir2/Test.txt is specified is shown. The file is copied onto TestDir/TestDir2/directory/that is the child directory of/TestDir.
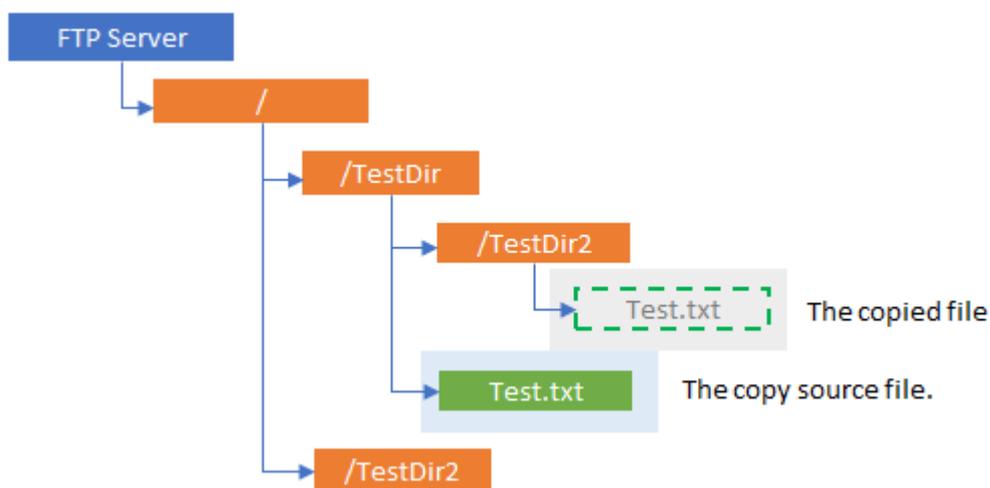

Figure 2-3 Copy result of having specified "./TestDir2/Test.txt" at copy destination

2.2.6.3. Only the file name is specified.

When only the file name is specified, it copies it onto the same directory as the copy origin. Figure 2-4 shows the copy result when Test2.txt is specified at the copy destination. The Test2.txt file is made in the same directory, and it is copied there.
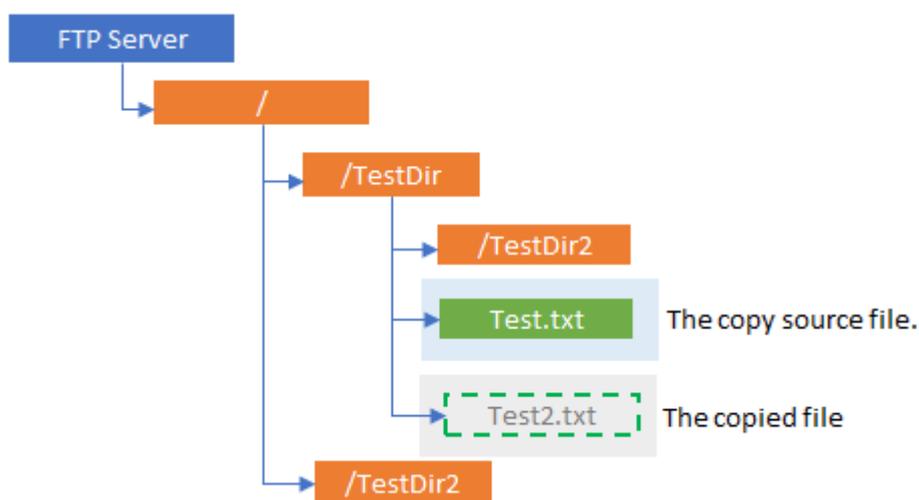
Figure 2-4 Copy result of having specified "Test2.txt" at copy destination

2.2.6.4. The delimiter in the end of passing.

Directory/file is copied by the same to copy origin name following passing specified that the delimiter is specified at the end of passing. Figure 2-5 shows the copy result when/TestDir2/is specified at the copy destination.

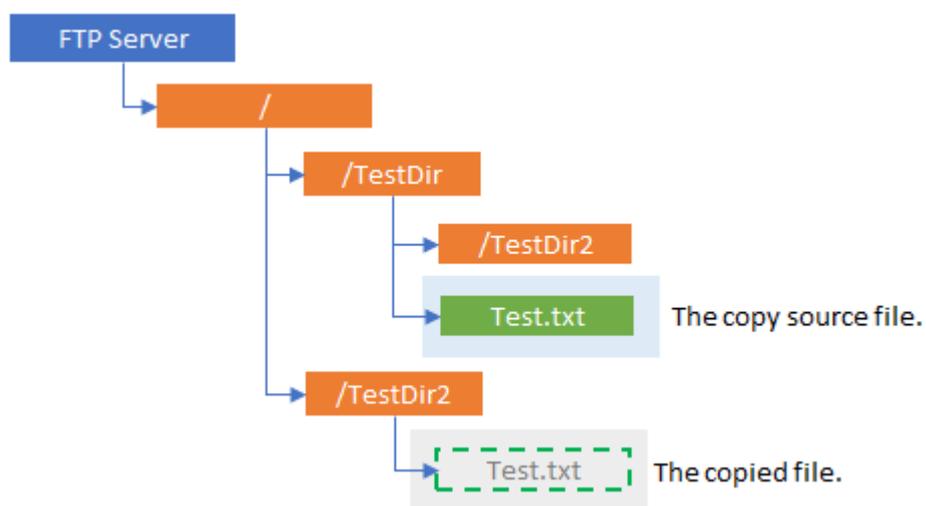**Figure 2-5 Result of having specified "/TestDir2/" at copy destination**

2.2.7. CaoFile::Delete method

Delete the file that corresponds to the object. It is necessary to erase the object with the client when it is needless because the object is not deleted after it deletes a file.

Moreover, delete only the file and the subdirectory in that when the file that corresponds to the object is a FTP root directory.

Since the file deletion spec differs depending on the FTP server, it may fail during Delete process[2]. At this time, the file that has already been deleted is not returned.

2.2.8. CaoFile::Move method

Executing this method moves the file to the specified location on the FTP server.

At this time, a method of specifying passing and an optional character string in the moving destination are the same as the Copy method.

2.2.9. CaoFile::Execute method

Execute the enhancing command of CaoFile. The specification of Execute is shown as follows.

```
Execute
(
 "Refresh",              // Command name
 ""                      // Parameter (unused)
)
```

The enhancing command list that can be specified with Execute is shown as follows. The enhancing command is detailed and the usage example is described.

Command	Explanation	Reference
Refresh	The attribute, the size of the file, and information on updated day and hour are updated. The error is returned when an actual file is lost when updating it. The argument is not necessary for this command.	--
Download	Download it to passing that specifies directory/file corresponding to CaoFile.	P.13
Upload	Up-load directory/file specified for the directory corresponding to CaoFile.	P.14
Raw	Sends the string passed in the argument as an FTP command to the server. Returns an error if CaoFile corresponds to a file.	P.17

2.2.9.1. Download command

Download it to the directory of a local passing that specifies directory/file that corresponds to the CaoFile object. All subdirectories and files in not the directory but the directory are downloaded for the CaoFile object that corresponds to the directory.

Item	Type explanation

---

[2] It may not be possible to delete a file if it is read-only and the folder is set to the working directory.
The latter can be avoided by executing the parameter as "CWD parent directory path" in the RAW command of Execute method.

Item	Type explanation	
Argument	VT_BSTR	Passing local PC of the directory of the download destination is specified. The specification of passing is the same as the Copy method. A standard passing of the relative path follows the value of optional ReferencePath specified with CaoWorkspace::AddController.
	VT_BOOL	Specify whether to preserve the superscription when the same file exists. It operates in overwrite mode when omitting it. It fails in download when False is specified and the file of the same name has already existed at the download destination.
Return value	None	

Sample

When the composition of the FTP server of the connection destination is Figure 2-6, the example of downloading/TestDir/directory to local folder C:¥Download¥ by the same name is described.
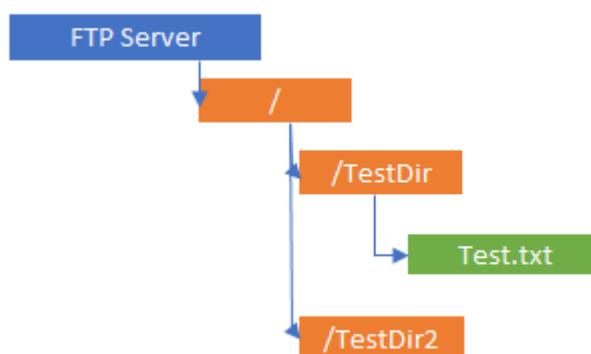
Figure 2-6 Composition of FTP server

```
Set ctrl = workspace.AddController("sample", _
            "CaoProv.FTPS", _
            "", _
            "Server=FTPServer,User=User,Password=Passwd,ReferencePath=C:¥Download¥")


' The child directory is added to CaoController.
Dim childDir As CaoFile
Set childDir = ctrl.AddFile("childDir")

' It downloads it to "C:¥Download¥" by the same name.
Call childDir.Execute("Download", "./")
```

2.2.9.2. Upload command

Up-load directory/file of local passing of the specification to the directory that corresponds to the CaoFile object. It is not possible to execute it with the CaoFile object that corresponds to the file.

Item	Type explanation	
Argument	VT_BSTR	Passing local PC of directory/file to be up-loaded is specified. Both the absolute path and the relative path can be specified for the specification of passing. A standard passing of the relative path follows the value of optional ReferencePath specified with CaoWorkspace::AddController.
	VT_BOOL	Specify whether to preserve the superscription when the same file exists. It operates in overwrite mode when omitting it. When False is specified, it operates like setting a unique name by the automatic operation.
Return value	None	

The place up-loaded by the method of specifying the up-loading origin is as follows.

<p align="center">Table 2-6 Method of specifying up-loading origin</p>

Method of specifying up-loading origin	Result	Example:Specification method	Up-loading result
Absolute path	Add directory/file specified by the absolute path to the directory corresponding to CaoFile.	C:/SourceDir	/TestDir/SourceDir
Relative path	Add directory/file specified by the relative path from a present directory to the directory corresponding to CaoFile.	./SourceFile,txt	/TestDir/SourceFile.txt

At this time, ..TestDir ".. assume passing the directory that corresponds to CaoFile.

Sample

The composition of the FTP server of the connection destination describes the example of up-loading the C:¥Download¥TestDir¥Test.txt file to/UploadedDir/directory at the left side of Figure 2-7. If the sample code is executed, the composition of the FTP server becomes like the right side of Figure 2-7.
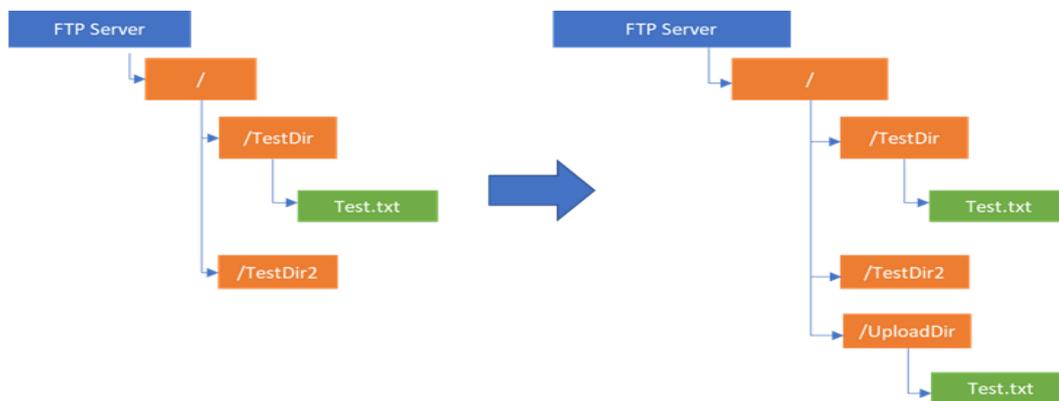
<p align="center">**Figure 2-7 Composition of FTP server before Upload is executed (left) and after Upload is executed (right)**</p>

```
Set ctrl = workspace.AddController("sample", _
            "CaoProv.FTPS", _
            "", _
            "Server=FTPServer,User=User,Password=Passwd,ReferencePath=C:¥Download¥")


' UploadDir is made and it adds it to CaoController.
Dim uploadDir As CaoFile
```

```
        Set uploadDir = ctrl.AddFile("UploadDir", "@Create")

        ' Test.txt is up-loaded to UploadDir.
        Call uploadDir.Execute("Upload", ".\TestDir\Test.txt")
```

2.2.9.3. Raw command

Send the string passed in the argument as an FTP command. Returns an error if CaoFile corresponds to a file. The current directory when FTP command is sent is the directory corresponding to CaoFile. The parameters and return values are the same as the raw commands for CaoController::Execute method (2.2.3.1).

2.2.10. CaoFile::get_FileNames property

Acquire subdirectory/file name list that exists in the directory that corresponds to the CaoFile object. This property fails in the file of correspondence to the CaoFile object.

2.2.11. CaoFile::get_Attribute property

In the GetAttribute method, whether corresponding to the object is a file or a directory is distinguished.

Tablez 2-7 Attribute that can be acquired with GetAttribute and the value

Attribute name	Value
File	0x080
Directory	0x010

2.2.12. CaoFile::get_Path property

Acquire passing the file that corresponds to the object. The file name is not included in the acquired value.

2.2.13. CaoFile::get_Size property

Acquire the size of the file that corresponds to the object. It fails in the directory.

2.2.14. CaoFile::get_Type property

Acquire the extension of the file that corresponds to the object. It fails in the directory.

2.2.15. CaoFile::get_DateLastModified property

Acquire the last updated date and time of the file that corresponds to the object. It fails in the directory the correspondence file.

2.2.16. CaoFile::get_Value property

Acquire the content of the file that corresponds to the object. The character string besides, acquire the content in the binary array when the extension of the file is "txt". It fails in the directory. Also, in this property,

when acquiring a character string, the file size should be 100 MB or less, and when acquiring in a binary array, the file size should be 200 MB or less. Please note that if the file size is large, the memory will be over.

For the transfer mode with the FTP server, specify the Mode option in the option string of the AddFile method. The relationship between the value of the Mode option and the transfer mode is shown in Table 2-8.

<p align="center">Table 2-8 "Mode" Property and operation of forwarding mode of GetValue</p>

"Mode" Property value	Forwarding mode
0	Set the forwarding mode according to the file type of the object file. Text file: ASCII mode Excluding the text file: The BINARY mode.
1	ASCII mode
2	BINARY mode

2.2.17. CaoFile::put_Value property

Set the content of the file that corresponds to the object. Even if data is sent to the provider by either the character string or the binary array, the client can be set. It fails in the directory.

The forwarding mode with the FTP server specifies optional Mode by an optional character string of the AddFile method. The relation between the value and the forwarding mode of optional Mode is as follows.

<p align="center">Table2-9 "Mode" Property and operation of forwarding mode of PutValue</p>

"Mode" Property value	Forwarding mode
0	Set the forwarding mode according to the data type from the client. Character string type: ASCII mode Binary array: BINARY mode
1	ASCII mode
2	BINARY mode

2.3. Variable list

There is no variable peculiar to the FTPS provider.

2.4. Error code

In the FTPS provider, the following and peculiar the error code is defined. Please refer to the chapter of the error code of "The ORiN2 programming guide" for the ORiN2 commonness error.

Table 2-10 Original error code list

Error name	Error number	Explanation
E_CAOP_FILENOTFOUND	0x80110002	The file is not found.
E_CAOP_SOURCEDIRECTORY	0x80110003	Nipponia nippon as which copy destination and copy origin are the same. Nipponia nippon as which moving destination and movement origin are the same. When the copy destination is a subdirectory of the copy origin. When the moving destination is a subdirectory of the movement origin.

3. Sample program

The content of the file is acquired from the FTP server, and the set sample is shown as follows.

Server name	:	"FTPServer"
File passing	:	"/SampleDir/Sample.txt"
User-name	:	"User"
Password	:	"Password"

List 3-1	Sample.frm

```
Private eng As CaoEngine
Private ctrl As CaoController
Private file As CaoFile

Private Sub Form_Load()

    Dim ws As CaoWorkspace

    Set eng = New CaoEngine
    Set ws = eng.Workspaces(0)

    ' connection with FTP server
    Set ctrl = ws.AddController("sample", _
                                "CaoProv.FTPS", _
                                "", _
                                "Server=FTPServer,User=User,Password=Password")
    '  acquisition of file
    Set file = ctrl.AddFile("Sample.txt", "Path=/SampleDir")
End Sub

'setting of content of file
Private Sub Command1_Click()
    file = Text1.Text
End Sub

' acquisition of content of file
Private Sub Command2_Click()
    Text2.Text = file
End Sub
```