



SIM7080 Series FTP Application Note

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[1] SIM7080 Series_AT Command Manual_V1.02

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1 Purpose of this document

Based on module AT command manual, this document will introduce FTP application process.

Developers could understand and develop application quickly and efficiently based on this document.

2 FTP Introduction

File Transfer Protocol (FTP) is a TCP-based protocol that uses a client/server model. Through the FTP protocol, users can upload or download files in the FTP server. Although there are many sites downloaded through the HTTP protocol, the FTP protocol can control the number of users and the distribution of broadband, and upload and download files quickly and easily. Therefore, FTP has become the preferred server for file uploading and downloading on the network. At the same time, it is also an application that allows users to connect their computers to all servers running FTP protocols around the world, accessing a large number of programs and information on the server. The function of the FTP service is to realize the off-site transmission of complete files.

2.1 Features

- (1) FTP uses two parallel connections: control connections and data connections. The control connection transfers control commands between the two hosts, such as user identity, password, directory change command, and so on. Data connections are only used to transfer data.
- (2) During a session, the FTP server must maintain the user state, that is, the control connection with a certain user cannot be disconnected. In addition, when the user is active in the directory tree, the server must track the user's current directory, so that FTP limits the number of concurrent users.
- (3) FTP support files are transmitted in any direction. When a user establishes a connection with a remote computer, the user can obtain a remote file or transfer a local file to a remote machine.

2.2 Working Mode

FTP is a TCP-only service and does not support UDP. The difference is that FTP uses 2 ports, a data port and a command port (also called a control port). Usually these two ports are 21 (command port) and 20 (data port). But the way FTP works, the data port is not always 20. This is the biggest difference between active and passive FTP. There are two main modes of operation:

2.2.1 Active FTP Mode

Active FTP is the port mode. The client connects to the command port of the FTP server from an arbitrary non-privileged port N ($N > 1024$), which is also the 21 port. The client then listens on port N+1 and sends the FTP command "port N+1" to the FTP server. The server then connects to its own data port (N+1) from its own data port (20).

For the firewall in front of the FTP server, the following communication must be allowed to support active mode FTP:

1. Any port larger than 1024 to port 21 of the FTP server. (client-initiated connection)
2. Port 21 of the FTP server to a port larger than 1024. (The server responds to the client's control port)
3. The port of the FTP server is 20 ports to more than 1024 ports. (The server side initializes the data connection to the client's data port)
4. More than 1024 ports to port 20 of the FTP server (the client sends an ACK response to the server's data port)

2.2.2 Passive FTP Mode

In order to solve the problem of the server initiating the connection to the client, a different FTP connection method was developed. This is called passive mode, or PASV, which is enabled when the client notifies the server that it is in passive mode.

In passive mode FTP, both the command connection and the data connection are initiated by the client, so that the problem that the incoming connection from the server to the client's data port is filtered by the firewall can be solved.

When an FTP connection is opened, the client opens two arbitrary non-privileged local ports ($N > 1024$ and $N+1$). The first port connects to port 21 of the server, but unlike active mode FTP, the client does not submit a PORT command and allows the server to connect back and forth to its data port, instead submitting a PASV command. The result of this is that the server will open an arbitrary non-privileged port ($P > 1024$) and send a PORT P command to the client. The client then initiates a connection from the local port N+1 to the port P of the server for transmitting data.

For server-side firewalls, the following communication must be allowed to support passive FTP:

1. From any port larger than 1024 to port 21 of the server (client-initiated connection)
2. The server's 21 port to any port greater than 1024 (the server responds to the client's control port connection)
3. From any port greater than 1024 to the server greater than 1024 ports (client initialization data connection to any port specified by the server)
4. The server is larger than 1024 ports to remote ports greater than 1024 (the server sends ACK response and data to the client's data port)

3 AT Commands for FTP

Command	Description
AT+FTPPORT	Set FTP control port
AT+FTPMODE	Set active or passive FTP mode
AT+FTPTYPE	Set the type of data to be transferred
AT+FTPPUTOPT	Set FTP put type
AT+FTPCID	Set FTP bearer profile identifier
AT+FTPREST	Set resume broken download
AT+FTPSERV	Set FTP server address
AT+FTPUN	Set FTP user name
AT+FTPPW	Set FTP password
AT+FTPGETNAME	Set download file name
AT+FTPGETPATH	Set download file path
AT+FTPPUTNAME	Set upload file name
AT+FTPPUTPATH	Set upload file path
AT+FTPGET	Download file
AT+FTPPUT	Set upload file
AT+FTPDELE	Delete specified file in FTP server
AT+FTPSIZE	Get the size of specified file in FTP server
AT+FTPSTATE	Get the FTP state
AT+FTPEXTPUT	Extend upload file
AT+FTPMKD	Make directory on the remote machine
AT+FTPRMD	Remove directory on the remote machine
AT+FTPLIST	List contents of directory on the remote machine
AT+FTPEXTGET	Extend download file
AT+FTPETPUT	Upload File
AT+FTPETGET	Download File
AT+FTPQUIT	Quit current FTP session
AT+FTPRENAME	Rename the Specified File on the Remote Machine
AT+FTPMDTM	Get the Last Modification Timestamp of Specified File on the Remote Machine

For detail information, please refer to “SIM7080 Series_AT Command Manual”.

4 Bearer Configuration

Usually module will register PS service automatically.

4.1 PDN Auto-activation

AT Command	Response	Description
AT+CPIN?	+CPIN: READY OK	Check SIM card status
AT+CSQ	+CSQ: 27,99 OK	Check RF signal
AT+CGATT?	+CGATT: 1 OK	Check PS service. 1 indicates PS has attached.
AT+COPS?	+COPS: 0,0,"CHN-CT",9 OK	Query Network information, operator and network mode 9, NB-IOT network
AT+CGNAPN	+CGNAPN: 1,"ctnb" OK	Query CAT-M or NB-IOT network after the successful registration of APN
AT+CNACT=0,1	OK +APP PDP: 0,ACTIVE	Activating network bearing
AT+CNACT?	+CNACT: 0,1,"10.94.36.44" +CNACT: 1,0,"0.0.0.0" +CNACT: 2,0,"0.0.0.0" +CNACT: 3,0,"0.0.0.0" OK	Get local IP

5 FTP Samples

5.1 FTP GET Method

Download data from FTP server.

AT Command	Response	Description
AT+FTPCID=0	OK	Set parameters for FTP session.

AT+FTPSERV="112.74.93.163"	OK	
AT+FTPUN="simcomtest"	OK	
AT+FTPPW="simcomtest"	OK	
AT+FTPGETNAME="simftp.txt"	OK	
AT+FTPGETPATH="/"	OK	
AT+FTPGET=1	OK +FTPGET: 1,1	Open the FTP get session. Data are available.
AT+FTPGET=2,1024	+FTPGET: 2,50 012345678901234567890123456 78901234567890123456789 OK	Request to read 1024 bytes, but Only 50 bytes are now available.
AT+FTPGET=2,1024	+FTPGET: 2,0 OK +FTPGET: 1,1	Request to read 1024 bytes again. No byte is now available, but it is not the end of session If the module receives data but user do not input "AT+FTPGET:2, <reqlength>" to read data, "+FTPGET: 1,1" will be shown again in a certain time.
AT+FTPGET=2,1024	+FTPGET: 2,1024 012345678901234567890123456 789012345678901234567890..... 1234 OK +FTPGET:1,0	Request to read 1024 bytes. 1024 bytes are now available.
		Data transfer finished. The connection to the FTP server is closed.

5.2 FTP PUT Method

Upload data to FTP server.

AT Command	Response	Description
AT+FTPCID=0	OK	Set parameters for FTP session.
AT+FTPSERV="112.74.93.163"	OK	
AT+FTPUN="simcomtest"	OK	
AT+FTPPW="simcomtest"	OK	
AT+FTPPUTNAME="simftp.txt"	OK	
AT+FTPPUTPATH="/"	OK	
AT+FTPPUT=1	OK +FTPPUT: 1,1,1360	Open the FTP put session. FTP session is ready for uploading. 1360 is the max length of data which can be sent at a time. It depends on the network status.
AT+FTPPUT=2,100	+FTPPUT: 2,100	Client requests to send 100 bytes.

		Response indicates that user must input 100 bytes for transferring now.
	<i>It is ready to receive data from UART, and DCD has been set to low.</i>
	OK	<i>All data has been received over, and DCD is set to high.</i>
	+FTPPUT: 1,1,1360	URC indicates that the FTP session is ready to transfer more data.
AT+FTPPUT=2,0	OK	No more data will be uploaded, the FTP session will be closed.
	+FTPPUT: 1,0	Data transfer is finished. The connection to the FTP server is closed.

During FTP session, different failure may occur because of bad network environment or other reasons. Some common failure includes timeout failure and wrong password failure.

5.3 FTP Time out

Time out occurs during FTP session because of different reasons.

AT Command	Response	Description
AT+FTPGET=1	OK	Open the FTP Get session.
	+FTPGET: 1,64	If the status of the network is poor, it may be time out. The connection to the FTP server is closed.
AT+FTPGET=1	OK	Open the FTP Get session.
	+FTPGET: 1,1	Data are available.
	+FTPGET: 1,1	If customer does not use "AT+FTPGET:2, <reqlength>" to read data, "+FTPGET:1,1" will be shown again in a certain time.
	
	+FTPGET: 1,1	
	+FTPGET: 1,64	If the user does not read data for a long time, the session will time out. The connection to the FTP server is closed.

5.4 FTP Error

Error occurs during FTP applications because of wrong parameter setting.

AT Command	Response	Description
AT+FTPPW="3214567"	OK	Set wrong password
AT+FTPGET=1	OK	Open the FTP Get session
	+FTPGET: 1,72	FTP session password error. The

connection to the FTP server is closed.

Note: Other errors, you can refer to "AT+FTPGET" command in 《SIM7080 Series AT Command Manual》

5.5 FTP Operation Error

Error occurs during FTP applications because of wrong operating.

AT Command	Response	Description
AT+FTPGET=1	OK	Open the FTP Get session.
	+FTPGET: 1,66	The parameter of "get file name" is empty. It shows ftp operation error.
AT+FTPPUT=1	OK	Open the FTP PUT session.
AT+FTPPUT=1	OK	Open the FTP PUT session again. Show ftp operation error.
	+FTPPUT: 1,66	

5.6 FTP READ and WRITE Error

Error occurs before FTP applications because of operating in wrong state.

AT Command	Response	Description
AT+FTPGET=1	OK	Open the FTP Get session.
AT+FTPGET=2,1000	ERROR	Read data before "+FTPGET: 1,1" is shown.
	+FTPGET: 1,1	Data are available
AT+FTPGET=2,1000	+FTPGET: 2,50 012345678901234567890123456 78901234567890123456789 OK	Read data after "+FTPGET: 1,1" is shown.
	+FTPGET: 1,0	Data transfer finished. The connection to the FTP server is closed.
AT+FTPGET=2,1000	ERROR	Read data after FTP session is stopped.
AT+FTPPUT=1	OK	Open the FTP PUT session.
AT+FTPPUT=2,1000	ERROR	Write data before "+FTPPUT: 1,1,1360" is shown.
	+FTPPUT: 1,1,1360	FTP session is ready for uploading.
AT+FTPPUT=2,100	+FTPPUT: 2,100 OK	Write data after "+FTPPUT: 1,1,1360" is shown.
AT+FTPPUT=2,0	OK	No more data will be uploaded, the FTP session will be closed.
AT+FTPPUT=2,100	ERROR	Write data after FTP session is stopped.

5.7 Set FTP Download Break Point Parameter

It provides the method to use FTP broken download resuming function.

AT Command	Response	Description
AT+FTPGET=1	OK	Open the FTP Get session.
	+FTPGET: 1,1	Data are available.
AT+FTPGET=2,1024	+FTPGET: 2,29 wodeceshijieguo,zhgeshigeshia	Get data of FTP server.
	OK	
	+FTPGET: 1,0	Data transfer finished. The connection to the FTP server is closed.
AT+FTPREST=20	OK	Set the broken point.
AT+FTPGET=1	OK	Open the FTP Get session.
	+FTPGET: 1,1	Data are available.
AT+FTPGET=2,1024	+FTPGET: 2,9 shigeshia	Get the data begin from the broken point.
	OK	
	+FTPGET: 1,0	Data transfer is finished. The connection to the FTP server is closed.

5.8 FTP DELE Method

Delete the specified file in FTP server.

AT Command	Response	Description
AT+FTPCID=0	OK	Set parameters for FTP session.
AT+FTPSERV="112.74.93.163"	OK	
AT+FTPUN="simcomtest"	OK	
AT+FTPPW="simcomtest"	OK	
AT+FTPGETNAME="simftp.txt"	OK	
AT+FTPGETPATH="/"	OK	
AT+FTPDELE=1	OK	Open the FTP DELE session.
	+FTPDELE: 1,0	Delete file finished. The connection to the FTP server is closed.

5.9 FTP SIZE Method

Get the size of specified file in FTP server.

AT Command	Response	Description
AT+FTPCID=0	OK	Set parameters for FTP session.
AT+FTPSERV="112.74.93.163"	OK	
AT+FTPUN="simcomtest"	OK	

AT+FTPPW="simcomtest"	OK	
AT+FTPGETNAME="simftp.txt"	OK	
AT+FTPGETPATH="/"	OK	
AT+FTPSIZE	OK	Open the FTP SIZE session.
	+FTPSIZE: 1,0,1024	Get the size of file finished. The connection to the FTP server is closed.

5.10 FTP MKD and RMD Method

Make and remove directory on the remote machine.

AT Command	Response	Description
AT+FTPCID=0	OK	Set parameters for FTP session.
AT+FTPSERV="112.74.93.163"	OK	
AT+FTPUN="simcomtest"	OK	
AT+FTPPW="simcomtest"	OK	
AT+FTPGETPATH="/"	OK	
AT+FTPMKD	OK	Open the FTP session.
	+FTPMKD: 1,0	The directory "test" is made on the remote machine
AT+FTPRMD	OK	Open the FTP session
	+FTPRMD: 1,0	The directory "test" is removed from the remote machine

5.11 FTP LIST Session

List contents of remote directory.

AT Command	Response	Description
AT+FTPCID=0	OK	Set parameters for FTP session.
AT+FTPSERV="112.74.93.163"	OK	
AT+FTPUN="simcomtest"	OK	
AT+FTPPW="simcomtest"	OK	
AT+FTPGETNAME="simftp.txt"	OK	
AT+FTPGETPATH="/"	OK	
AT+FTPLIST=1	OK	Open the FTP session.
	+FTPLIST: 1,1	Data are available
AT+FTPLIST=2,1024	+FTPLIST: 2,126 total 0 drw-rw-rw- 1 user group 0 Oct 12 14:58. drw-rw-rw- 1 user group 0 Oct 12 14:58...	Request to read 1024 bytes, but only 126 bytes are now available

	OK	
	+FTPLIST: 1,0	Data transfer finished. The connection to the remote machine is closed
AT+FTPGETPATH="/simftp.txt "	OK	Get the information of a certain file "simftp.txt"
AT+FTPLIST=1	OK +FTPLIST: 1,1	Open the FTP session.
		Data are available.
AT+FTPLIST=2,1024	+FTPLIST:2,78 -rw-rw---- 1 zhangkun simcom 8807854 Mar 19 13:31 /simftp.txt	Request to read 1024 bytes, in fact only 78 bytes are now available.
	OK //Returns information of the file	
	+FTPLIST: 1,0	Data transfer finished. The connection to the remote machine is closed.

5.12 FTP Extend PUT Method

Extend Upload data to the remote machine.

AT Command	Response	Description
AT+FTPCID=0	OK	Set parameters for FTP session.
AT+FTPSERV="112.74.93.163"	OK	
AT+FTPUN="simcomtest"	OK	
AT+FTPPW="simcomtest"	OK	
AT+FTPPUTNAME="simftp.txt"	OK	
AT+FTPPUTPATH="/"	OK	
AT+FTPEXTPUT=1	OK	Set FTP to extend put method.
AT+FTPEXTPUT=2,0,1024,10000	+FTPEXTPUT: 0,1024	Client requests to send 1024 bytes. Response indicates that user must input 1024 bytes for transferring. It is saved in the module.
	<i>It is ready to receive data from UART, and DCD has been set to low.</i>
	OK	<i>All data has been received over, and DCD is set to high.</i>
AT+FTPPUT=1	OK	Open the FTP PUT session. Waiting for the module to upload the data to the remote machine.
	+FTPPUT: 1,0	Data transfer finished. The connection

		to the remote machine is closed
AT+FTPEXTPUT=0	OK	Set FTP to normal put method

5.13 FTP Extend GET Method

Extend Download File

AT Command	Response	Description
AT+FTPCID=0	OK	Set parameters for FTP session.
AT+FTPSERV="112.74.93.163"	OK	
AT+FTPUN="simcomtest"	OK	
AT+FTPPW="simcomtest"	OK	
AT+FTPGETNAME="simftp.txt"	OK	
AT+FTPGETPATH="/"	OK	
AT+FTPEXTGET=1	OK	Open the FTP session.
AT+FTPEXTGET?	+FTPEXTGET: 1,64136	Query progress of FTP session
	OK	FTP session running, 64136 bytes data has been download.
	+FTPEXTGET: 1,0	File download succeed.
AT+FTPEXTGET=3,0,174125	+FTPEXTGET: 3,174125	Output receive data from position 0, length 174125
	Output data
	OK	Finish output
AT+FTPEXTGET=0	OK	End FTPEXTGET.

5.14 FTP ETPUT Method

Load file in RAM from file system then upload with FTPETPUT.

AT Command	Response	Description
AT+FTPCID=0	OK	Set parameters for FTP session.
AT+FTPSERV="112.74.93.163"	OK	
AT+FTPUN="simcomtest"	OK	
AT+FTPPW="simcomtest"	OK	
AT+FTPPUTNAME="simftp.txt"	OK	
AT+FTPPUTPATH="/"	OK	
AT+FTPETPUT=1	OK	Start FTP etput session
	+FTPETPUT: 1,1	FTP session is ready for uploading.
AT+FTPETPUT=2	OK	Client requests to send data.
		Response indicates that user must input data for transferring now.
	+FTPETPUT:2,1	<i>It is ready to receive data from UART, and DCD has been set to low.</i>
	<i>To notify the module that all data has</i>

<ETX>	been sent, switch from data mode to command mode
OK	All data has been received over, and DCD is set to high.
+FTPETPUT:1,0	Data transfer finished. The connection to the remote machine is closed.

5.15 FTP ETGET Method

Download data from the remote machine.

AT Command	Response	Description
AT+FTPCID=0	OK	Set parameters for FTP session.
AT+FTPSERV="112.74.93.163"	OK	
AT+FTPUN="simcomtest"	OK	
AT+FTPPW="simcomtest"	OK	
AT+FTPGETNAME="simftp.txt"	OK	
AT+FTPGETPATH="/"	OK	
AT+FTPETGET=1	OK	Start FTP etget session
	+FTPETGET: 1,1	Enter data transfer mode.
	012345678901234567890123456 789012345678901234567890..... 1234	Data transfer finished. The connection to the remote machine is closed. To notify the user that all data transfer has been finished, switch from data mode to command mode.
	<ETX>	
	+FTPETGET:1,0	

5.16 FTP QUIT Method

Quit current FTP session

AT Command	Response	Description
AT+FTPCID=0	OK	Set parameters for FTP session.
AT+FTPSERV="112.74.93.163"	OK	
AT+FTPUN="simcomtest"	OK	
AT+FTPPW="simcomtest"	OK	
AT+FTPGETNAME="simftp.txt"	OK	
AT+FTPGETPATH="/"	OK	
AT+FTPGET=1	OK	Open the FTP session.
AT+FTPQUIT	OK	Quit FTP session
	+FTPGET: 1,80	Manual quit FTP session

5.17 FTP Rename Method

Rename the specified file of remote machine.

AT Command	Response	Description
AT+FTPCID=0	OK	Set parameters for FTP session.
AT+FTPSERV="112.74.93.163"	OK	
AT+FTPUN="simcomtest"	OK	
AT+FTPPW="simcomtest"	OK	
AT+FTPGETPATH="/"	OK	
AT+FTPGETNAME="simftp.txt"	OK	The old file name is "1K.txt"
AT+FTPPUTNAME="simftp2.txt"	OK	The new file name is "1.txt"
AT+FTPRENAME	OK	Execute rename function. Rename the file "1K.txt" to "1.txt".
	+FTPRENAME:1,0	Rename action succeed. The file was renamed successfully

5.18 FTP MDTM Method

Get the last modification timestamp of specified file on the remote machine.

AT Command	Response	Description
AT+FTPCID=0	OK	Set parameters for FTP session.
AT+FTPSERV="112.74.93.163"	OK	
AT+FTPUN="simcomtest"	OK	
AT+FTPPW="simcomtest"	OK	
AT+FTPGETNAME="simftp.txt"	OK	
AT+FTPGETPATH="/"	OK	
AT+FTPMDTM	OK	Get the last modification timestamp.
	+FTPMDTM:1,0,20140409060951	Return the timestamp successfully.

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