SIM8200 Series_ HTTP(S)_Application Note

5G Module

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About Document

Version History

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1.00	2020.8.17	Xianxiang Ma	First Release

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1 Introduction

1.1 Purpose of the document

Based on module AT command manual, this document will introduce HTTP(S) application process. Developers could understand and develop application quickly and efficiently based on this document.

1.2 Related documents

[1] SIM8200 Series_AT Command Manual

1.3 Conventions and abbreviations

2 HTTP Introduction

HTTP (HyperText Transfer Protocol) is an application layer protocol. When you browse a web page, the browser and the web server will send and receive data on the Internet through the HTTP protocol. HTTP is a stateless protocol based on request and response patterns. That is what we usually call Request/Response.

2.1 Characteristic

➢ **Support client/server mode;**

✧ **Simple and fast**

When a client requests a service from a server, it only needs to pass the request method and path. Because the HTTP protocol is simple, the program size of the HTTP server is small, and the communication speed is fast.

✧ **Flexible**

HTTP allows the transfer of any type of data object. The type being transferred is marked by Content-Type;

✧ **No connection**

No connection means limiting the processing of only one request per link. After the server processes the client's request and receives the customer's response, the server disconnects the link. This way, the transmission time can be saved.

✧ **Stateless**

The HTTP protocol is a stateless protocol. Stateless means that the protocol has no memory for transaction processing. A lack of state means that if subsequent processing requires the previous information, it must be retransmitted, which may result in an increase in the amount of data transferred per connection. On the other hand, it responds faster when the server does not need previous information.

2.2 Request Method

According to the HTTP standard, HTTP requests can use a variety of request methods.
HTTP 1.0 defines three request methods: the GET, POST, and HEAD methods.
HTTP1.1 adds six new request methods: OPTIONS, PUT, PATCH, DELETE, TRACE, and CONNECT methods.

No	Method	Description
1	GET	Make a request to a specific resource.
2	HEAD	Ask the server for a response that is consistent with the GET request, except that the response body will not be returned. This method can obtain the meta information contained in the response message header without having to transmit the entire response content.
3	POST	Submit data to a specified resource for processing requests (such as submitting a form or uploading a file). The data is included in the request body. POST requests may result in the creation of new resources and/or modifications to existing resources.
4	PUT	Uploads its latest content to a specified resource location.
5	DELETE	Requests the server to delete the resource identified by the Request-URI.
6	CONNECT	H The HTTP/1.1 protocol is reserved for proxy servers that can connect connections to pipes.
7	OPTIONS	Returns the HTTP request method supported by the server for a particular resource. You can also test the functionality of the server by sending a '*' request to the web server.
8	TRACE	Echoes requests received by the server, primarily for testing or diagnostics.
9	PATCH	It is a supplement to the PUT method for local updating of known resources.

3 AT Commands for HTTP(S)

Command	Description
AT+CSSLCFG	Analysis SSL Configure
AT+HTTPPARA	Set HTTP(S) Parameter
AT+HTTPINIT	start HTTP(S) service
AT+HTTPACTION	HTTP Method Action
AT+HTTPHEAD	Read the HTTP Header Information of Server Response
AT+HTTPREAD	Read the response Information of Server Response
AT+HTTPDATA	You can use AT+HTTPDATA to input data to post when you send a HTTP/HTTPS POST request
AT+HTTPPOSTFILE	send HTTP request in a file via AT+HTTPPOSTFILE command
AT+HTTPREADFILE	Receive HTTP Response Content to a file
AT+HTTPTERM	stop HTTP service.

4 Bearer Configuration

Usually module will register PS service automatically.

4.1 PDN Auto-activation

```
// Example of PDP Auto-activation.
AT+CPIN?                                    // Check SIM card status
+CPIN: READY

OK
AT+CSQ                                      // Check RF signal
+CSQ: 27,99

OK
AT+CGREG?                                   // Check PS service
+CGREG: 0,1

OK
AT+COPS?                                    //Query Network information, operator and network
+COPS: 0,0,"CHN-CT",7                       mode 7, LTE network

OK
AT+CGACT=0,1                                // Activating network bearing
OK

AT+CGACT?
+CGACT: 0,1
+CGACT: 1,0
+CGACT: 2,0
+CGACT: 3,0
OK
```

5 HTTP(S) Samples

5.1 HTTP Function

5.1.1 HTTP GET

// Following commands shows how to send a HTTP GET request to server, and how to read HTTP response.

AT+HTTPINIT **OK**	// start HTTP service, activate PDP context
AT+HTTPPARA="URL","http://opinion.people.com.cn/GB/n1/2018/0815/c1003-30228758.html" **OK**	// set the URL which will be accessed, for HTTP, the request URL begins with "HTTP://"
AT+HTTPACTION=0 **OK**	// send HTTP GET request
+HTTPACTION: 0,200,22505	// 22505 is the length of HTTP response information
AT+HTTPHEAD **+HTTPHEAD: DATA,387**	// read the HTTP response header

HTTP/1.1 200 OK
Server: nginx
Content-Type: text/html
Connection: close
Date: Thu, 16 Aug 2018 05:13:36 GMT
Powered-By-ChinaCache: MISS   from 06053423gG.15
ETag: W/"5b7379f5-57e9"
Last-Modified: Wed, 15 Aug 2018 00:55:17 GMT
Expires: Thu, 16 Aug 2018 05:18:36 GMT
Vary: Accept-Encoding
X-Cache-Hits: 14

Content-Length: 22505
CC_CACHE: TCP_REFRESH_HIT
Accept-Ranges: bytes

OK
AT+HTTPREAD=0,16   // read 16 bytes form response data
OK   //data content：<!DOCTYPE html P

+HTTPREAD: DATA,16
<!DOCTYPE html P
+HTTPREAD: 0
AT+HTTPTERM
                                                 // stop HTTP Service
OK

5.1.2 Send HTTP POST Request

// HTTP POST and PUT

AT+HTTPINIT   // start HTTP service, activate PDP context
OK
AT+HTTPPARA="URL","http://api.efxnow.com/   //set the URL which will be accessed, for HTTP,
DEMOWebServices2.8/Service.asmx/Echo?"   the request URL begins with "HTTP://"
OK
AT+HTTPDATA=18,1000   // send data to post, the length is 18 bytes
DOWNLOAD
Message=helloworld
OK
AT+HTTPACTION=1   // send HTTP POST request
OK   // 30 is the length of HTTP response information

+HTTPACTION: 1,500,30

+HTTP_PEER_CLOSED
AT+HTTPHEAD   // read the HTTP response header
OK
+HTTPHEAD: DATA,258
HTTP/1.1 500 Internal Server Error
Cache-Control: private
Content-Type: text/plain; charset=utf-8
Server: Microsoft-IIS/7.0

X-AspNet-Version: 2.0.50727
X-Powered-By: ASP.NET
Date: Mon, 20 Aug 2018 04:18:58 GMT
Connection: close
Content-Length: 30

OK
AT+HTTPREAD=0,30   // read the response information of HTTP server,
OK   the length to read is 30 bytes

+HTTPREAD: DATA,30
Request format is invalid:

+HTTPREAD: 0
AT+HTTPTERM   // stop HTTP Service
OK

5.1.3 Send HTTP HEAD Request

// HTTP HEAD 示例

AT+HTTPINIT   // start HTTP service, activate PDP context
OK

AT+HTTPPARA="URL","http://opinion.people.   // set the URL which will be accessed, for HTTP,
com.cn/GB/n1/2018/0815/c1003-30228758.html   the request URL begins with "HTTP://"
"
OK
AT+HTTPACTION=2   //send a HEAD request to server to only get
OK   header of HTTP response

+HTTPACTION: 2,200,387

+HTTP_PEER_CLOSED

AT+HTTPHEAD   // send HTTP POST request
OK   // 30 is the length of HTTP response information

+HTTPACTION: 1,500,30

+HTTP_PEER_CLOSED

AT+HTTPHEAD   // read the HTTP response header

OK

+HTTPHEAD: DATA,387

HTTP/1.1 200 OK

Server: nginx

Content-Type: text/html

Connection: close

Vary: Accept-Encoding

Powered-By-ChinaCache: MISS   from 06053423gG.15

ETag: W/"5b7379f5-57e9"

Last-Modified: Wed, 15 Aug 2018 00:55:17 GMT

Content-Length: 22505

X-Cache-Hits: 14

Date: Thu, 16 Aug 2018 10:58:00 GMT

Expires: Thu, 16 Aug 2018 11:03:00 GMT

CC_CACHE: TCP_REFRESH_HIT

Accept-Ranges: bytes

OK

AT+HTTPREAD=0,30

OK

+HTTPREAD: DATA,30

Request format is invalid:

+HTTPREAD: 0

AT+HTTPTERM

OK   // stop HTTP Service

5.2 Access to HTTPS server

5.2.1   Send HTTPS GET Request

//HTTPS GET

AT+HTTPINIT   //start HTTP service, activate PDP context

OK

AT+HTTPPARA="URL",”https://ss0.bdstatic.com/5aV1bjqh_Q23odCf/static/mancard/css/card_min_dee38e45.css”	// set the URL which will be accessed, for HTTPS, the request URL begins with "HTTPS://"
OK	
AT+HTTPACTION=0	// send HTTPS GET request
OK	
+HTTPACTION: 0,200,52060	
AT+HTTPHEAD	// read HTTPS response header
+HTTPHEAD: DATA,390	//390 is the length of HTTPS response header
HTTP/1.1 200 OK	
Server: bfe/1.0.8.13-sslpool-patch	
Date: Thu, 16 Aug 2018 11:38:08 GMT	
Content-Type: text/css	
Content-Length: 52060	
Connection: close	
ETag: "5a323f72-cb5c"	
Last-Modified: Thu, 14 Dec 2017 09:08:02 GMT	
Expires: Sat, 18 Aug 2018 09:50:53 GMT	
Age: 2425635	
Accept-Ranges: bytes	
Cache-Control: max-age=2592000	
Vary: Accept-Encoding	
Ohc-Response-Time: 1 0 0 0 0 0	
OK	
AT+HTTPREAD=0,24	
OK	
+HTTPREAD: DATA,24	
.s-cardsetting{position:	
+HTTPREAD: 0	
AT+HTTPTERM	// stop HTTP Service
OK	

5.2.2 Send HTTPS POST Request

//HTTPS POST

AT+HTTPPARA="URL","https://pv.csdn.net/csdnbi"	// set the URL which will be accessed, for HTTPS, the request URL begins with "HTTPS://"
OK	
AT+HTTPINIT **OK**	///start HTTP service, activate PDP context
AT+HTTPDATA=465,1000	// send data to post, the length is 465 bytes
DOWNLOAD	

[{"headers":{"component":"enterprise","datatype":"track","version":"v1"},"body":"{\"re\":\"uid=merry1996&ref=https%3A%2F%2Fpassport.csdn.net%2Faccount%2Fverify%3Bjsessionid%3D7895A57BC64CE8616517F558940FD913.tomcat2&pid=www&mod=&con=&ck=-&curl=https%3A%2F%2Fwww.csdn.net%2F&session_id=10_1534696351647.160829&tos=12&referrer=https%3A%2F%2Fpassport.csdn.net%2Faccount%2Fverify%3Bjsessionid%3D7895A57BC64CE8616517F558940FD913.tomcat2&user_name=merry1996&type=pv\"}"}]

OK

AT+HTTPACTION=1 **OK**	//send HTTPS post request
	//2 is the length of HTTPS response information

+HTTPACTION: 1,200,2
+HTTP_PEER_CLOSED

AT+HTTPHEAD **OK**	//read the HTTPS response header

+HTTPHEAD: DATA,377
HTTP/1.1 200 OK
Server: openresty
Date: Mon, 20 Aug 2018 03:20:30 GMT
Content-Type: application/octet-stream
Connection: close
Set-Cookie: uuid_tt_dd=10_37481894210-1534735230305-445993; Expires=Thu, 01 Jan 2025 00:00:00 GMT; Path=/; Domain=.csdn.net;
Set-Cookie: dc_session_id=10_1534735230305.501284; Expires=Thu, 01 Jan 2025 00:00:00 GMT; Path=/; Domain=.csdn.net;

OK

AT+HTTPTERM   // stop HTTP Service
OK

5.2.3 Send HTTPS HEAD Request

// HTTPS HEAD

AT+HTTPINIT   //start HTTP service, activate PDP context
OK

AT+HTTPPARA="URL",”https://ss0.bdstatic.co   //set the URL which will be accessed, for HTTPS,
m/5aV1bjqh_Q23odCf/static/mancard/css/card   the request URL begins with "HTTPS://"
_min_dee38e45.css”
OK
AT+HTTPACTION=2
OK   // send HTTPS HEAD request

+HTTPACTION: 2,200,390

+HTTP_PEER_CLOSED
AT+HTTPHEAD
+HTTPHEAD: DATA,390   // read HTTPS response header

HTTP/1.1 200 OK
Server: bfe/1.0.8.13-sslpool-patch
Date: Thu, 16 Aug 2018 11:46:22 GMT
Content-Type: text/css
Content-Length: 52060
Connection: close
ETag: "5a323f72-cb5c"
Last-Modified: Thu, 14 Dec 2017 09:08:02 GMT
Expires: Sat, 18 Aug 2018 09:50:53 GMT
Age: 2426129
Accept-Ranges: bytes
Cache-Control: max-age=2592000
Vary: Accept-Encoding
Ohc-Response-Time: 1 0 0 0 0 0

OK
AT+HTTPTERM
OK   //stop HTTP Service

5.2.4 POSTFILE to HTTPS server and read HTTPS response content to a file

// HTTPS POST/PUT	
AT+HTTPINIT **OK**	/// start HTTP service, activate PDP context
AT+HTTPPARA="URL","https://www.baidu.com" **OK**	//access server and send file getbaidu.txt to server
AT+HTTPPOSTFILE="getbaidu.txt",1,0 **OK**	// access server and send file getbaidu.txt to server
+HTTPPOSTFILE: 0,200,14615	
+HTTP_PEER_CLOSED **AT+HTTPHEAD** **+HTTPHEAD: DATA,773** **HTTP/1.1 200 OK** **Accept-Ranges: bytes** **Cache-Control: no-cache** **Connection: Keep-Alive** **Content-Length: 14615** **Content-Type: text/html** **Date: Thu, 13 Sep 2018 05:14:30 GMT** **Etag: "5b8641dc-3917"** **Last-Modified: Wed, 29 Aug 2018 06:49:00 GMT** **P3p: CP=" OTI DSP COR IVA OUR IND COM "** **Pragma: no-cache** **Server: BWS/1.1** **Set-Cookie:** **BAIDUID=A374BCFD28DFEEAF0BA0C4EEAC** **77B0B0:FG=1; expires=Thu, 31-Dec-37** **23:55:55 GMT; max-age=2147483647; path=/;** **domain=.baidu.com** **Set-Cookie:** **BIDUPSID=A374BCFD28DFEEAF0BA0C4EEA** **C77B0B0; expires=Thu, 31-Dec-37 23:55:55** **GMT; max-age=2147483647; path=/;** **domain=.baidu.com** **Set-Cookie: PSTM=1536815670; expires=Thu,** **31-Dec-37 23:55:55 GMT;** **max-age=2147483647; path=/;** **domain=.baidu.com**	// read the HTTP server response header information.

Vary: Accept-Encoding
X-Ua-Compatible: IE=Edge,chrome=1

OK
AT+HTTPTERM   // stop HTTPS Service
OK