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About Document

Version History

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<td>1.00</td>
<td>2018.04.10</td>
<td>Linshu Guan</td>
<td>First Release</td>
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<tr>
<td>1.01</td>
<td>2018.06.07</td>
<td>Albert Meng</td>
<td>Revised</td>
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<tr>
<td>1.02</td>
<td>2019.05.10</td>
<td>Wenjie.lai</td>
<td>Change CoAP Connection and Service</td>
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<td>2020.06.10</td>
<td>Xiaohui.xu</td>
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Scope

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1 Introduction

1.1 Purpose of the document

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

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

1.2 Related documents


1.3 Conventions and abbreviations

In this document, the GSM engines are referred to as following term:
ME (Mobile Equipment);
MS (Mobile Station);
TA (Terminal Adapter);
DCE (Data Communication Equipment) or facsimile DCE (FAX modem, FAX board);

In application, controlling device controls the GSM engine by sending AT Command via its serial interface. The controlling device at the other end of the serial line is referred to as following term:
TE (Terminal Equipment);
DTE (Data Terminal Equipment) or plainly "the application" which is running on an embedded system;
2 CoAP Introduction

In the IoT application, there is a network between the device and the device, and they need to communicate with each other. However, because IoT devices are usually resource-constrained, limited CPU capacity, limited RAM, limited flash, and limited network bandwidth, the CoAP (Constrained Application Protocol) protocol borrows the HTTP protocol mechanism and simplifies for such special scenarios. The protocol Packet format. The communication between IoT devices is succinctly realized.

CoAP protocol features:
1) Based on message model, four message types are defined, and the message is the data communication carrier, and the data communication between devices is realized by exchanging network messages.
2) The operation of the CoAP Server cloud device resource is completed by the request and response mechanism. Similar to HTTP, the device can operate the server resource through four request methods (GET, PUT, POST, DELETE). The request and response packets are placed in the CoAP message for transmission.
3) Message-based two-way communication (M2M), both the CoAP Client and the CoAP server can send requests to each other independently. Both parties can be in the client or server role;
4) The protocol packet is lightweight and has a minimum length of only 4B.
5) Support reliable transmission, data retransmission, block transmission. Ensure that data arrives reliably.
6) Support IP multicast, which can send requests to multiple devices at the same time (such as CoAP client search for CoAP Server).
7) Non-long connection communication for low power IoT scenarios.
3 AT Commands for CoAP

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
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<tr>
<td>AT+CCOAPNEW</td>
<td>Create a CoAP client instance</td>
</tr>
<tr>
<td>AT+CCOAPSEND</td>
<td>Send CoAP data</td>
</tr>
<tr>
<td>AT+CCOAPCSEND</td>
<td>Send CoAP data</td>
</tr>
<tr>
<td>AT+CCOAPDEL</td>
<td>Destroy the CoAP client instance</td>
</tr>
<tr>
<td>+CCOAPNMI</td>
<td>Content from CoAP server</td>
</tr>
</tbody>
</table>

For detail information, please refer to “SIM7020 Series_AT Command Manual”.
4 Bearer Configuration

Usually module will register PS service automatically.

4.1 PDN Auto-activation

//Example of PDN Auto-activation.

AT+CPIN?  //Check SIM card status
+CPIN: READY
OK

AT+CSQ  //Check RF signal
+CSQ: 20,0
OK

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

AT+CGACT?  //Activated automatically.
+CGACT: 1,1
OK

AT+COPS?  //Query Network information, operator and network mode 9, NB-IOT network
+COPS: 0,2,"46000",9
OK

AT+CGCONTRDP  //Attached PS domain and got IP address automatically.
+CGCONTRDP:
1,5,"cmnbiot","100.80.73.123.255.255.255.0"
OK
4.2 APN Manual configuration

If not attached automatically, could configure correct APN setting.

//Example of APN Manual configuration.

```
AT+CFUN=0
+CPIN: NOT READY
OK
AT*MCGDEFCONT="IP","cmnbio"
OK
AT+CFUN=1
OK
+CPIN: READY
AT+CGREG?
+CGREG: 0,1
OK
AT+CGCONTRDP
+CGCONTRDP: 1,5,"cmnbio","100.80.73.255.255.255.0"
OK
```

Attached PS domain and got IP address automatically
5 CoAP Examples

//Example of CoAP Connection and Service.

AT+COPNE="10.161.11.104",5683,1  //Create client instance
+COPNE: 1  //If succeed, client instance id will return.
OK
AT+COPSEND=1,12,"400141C7B7636F756E746572"  //Send hex data to server.
OK
+COPNMI: 1,11,"60457233c02105ff303234"  //Got data from server
AT+COPCSEND=1,1,0,0,1,,"B7636F756E746572",,  //Send hex data to server.
OK
+COPNMI: 1,11,"60457233c02105ff303234"  //Got data from server
AT+COPDEL=1  //Release Client instance
OK