SIM7020 Series_SNTP_Application Note

LPWA Module
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Version History

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<td>2018.12.25</td>
<td>Chengliang.Wang</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 SNTP 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 SNTP Introduction

The Network Time Protocol (NTP) is a protocol used to synchronize computer time. It allows the computer to synchronize its server or clock source (such as quartz clock, GPS, etc.), which provides high accuracy. Degree of time correction (on the LAN with standard time difference of less than 1 millisecond, tens of milliseconds on the WAN), and can be used to prevent malicious protocol attacks by means of cryptographic confirmation.

Simple Network Time Protocol (SNTP) is defined in RFC2030 and adapted from NTP, is mainly used to synchronize computer clocks on the Internet.

The SNTP protocol works in a client/server manner and can operate in unicast (peer-to-peer) or broadcast (point-to-multipoint) mode. The SNTP server uses the GPS signal or its own atomic clock as the time base for the system. In unicast mode, the SNTP client can obtain accurate time information by periodically accessing the SNTP server, which is used to adjust the time of the client's own system to achieve synchronization time. In broadcast mode, the SNTP server periodically sends a message to a specified IP broadcast address or IP multicast address. The SNTP client obtains time information by listening to these addresses.

Currently SIM7020 Series only supports SNTP function.
3 Bearer Configuration

Usually module will register PS service automatically.

3.1 PDN Auto-activation

//Example of PDN Auto-activation.

```
AT+CPIN?          // Check SIM card status
+CPIN: READY
OK
AT+CSQ           // Check RF signal
+CSQ: 27,99
OK
AT+CGATT?        // Check PS service. 1 indicates PS has attached.
+CGATT: 1
OK
AT+CGACT?        // PDN active success
+CGACT:1,1
OK
AT+COPS?         // Query Network information, operator and network mode 9, NB-IOT network
+COPS:0,0,"CHN-UNICOM",9
OK
AT+CGCONTRDP     // Attached PS domain and got IP address automatically
+CGCONTRDP: 1,5,"shnbioi","10.250.0.213.255.255.255.0"
OK
```

3.2 APN Manual configuration
//Example of APN Manual configuration.

AT+CFUN=0                       // Disable RF
+CPIN: NOT READY
OK

AT*MCGDEFCONT="IP","3GNET"     // Set the APN manually
OK

AT+CFUN=1                       // Enable RF
OK
+CPIN:READY

AT+CGATT?                       // Inquiry PS service
+CGATT: 1
OK

AT+CGCONTRDP                   // Attached PS domain and got IP address
+CGCONTRDP: 1,
1,5,"3GNET","10.250.0.253.255.255.255.0"
OK
4 SNTP Service

4.1 Synchronous UTC Time

```
//Example of Synchronous UTC Time
AT+CSNTPSTART="202.112.29.82"
OK
+CSNTP: 18/05/16,08:54:20:135
AT+CCLK?
+CCLK: 18/05/16,08:54:31+32
OK
AT+CSNTPSTOP
OK
```

//Configure the SNTP server instance and connect to start querying the network time. The parameters include the server: jp.ntp.org.cn. The server can be an IP address or a domain name. It can also be 202.112.29.82; 223.113.97.99; 182.92.12.11.

4.2 Synchronous URC time and time zone

```
//Example of Synchronous UTC Time and time zone
AT+CSNTPSTART="202.112.29.82","+32"
OK
+CSNTP: 18/05/16,08:54:20:135+32
AT+CCLK?
+CCLK: 18/05/16,08:54:31+32
OK
AT+CSNTPSTOP
OK
```

//Configure the SNTP server instance and connect to start querying the network time. The parameters include the server: jp.ntp.org.cn. The server can be an IP address or a domain name. It can also be 202.112.29.82; 223.113.97.99; 182.92.12.11.
### 4.3 Synchronous RTC time

//Example of Synchronous RTC Time

AT+CURTC=1
OK

AT+CURTC?
+CURTC: 1
OK

AT+CSNTPSTART="jp.ntp.org.cn"
OK

+CSNTP: 18/09/06,05:17:04:18+08

AT+CCLK?
+CCLK: 18/09/06,13:17:51+08
OK

AT+CSNTPSTOP
OK

//After setting the synchronization, CCLK shows the RTC time (this command will take effect after next power up)

//Query CURTC setting

//Configure the SNTP server instance and connect to start querying the network time. The parameters include the server: jp.ntp.org.cn. The server can be an IP address or a domain name. It can also be 202.112.29.82; 223.113.97.99; 182.92.12.11.

//The query is local time at this time.

//Stop querying network time

### 4.4 Synchronous RTC time and time zone

//Example of Synchronous RTC Time and time zone

AT+CURTC=1
OK

AT+CURTC?
+CURTC: 1
OK

AT+CSNTPSTART="jp.ntp.org.cn", "+08"
OK

+CSNTP: 18/09/06,05:17:04:18

//After setting the synchronization, CCLK shows the RTC time (this command needs to be set before the restart takes effect)

//Query CURTC settings

//Configure the SNTP server instance and connect to start querying the network time. The parameters include the server: jp.ntp.org.cn; the server can be an IP address or a domain name, or 202.112.29.82; 223.113.97.99; 182.92.12.11.
AT+CCLK?
+CCLK: 18/09/06,13:17:51+32
OK
AT+CSNTPSTOP
OK

+08" represents the time zone for the East Second District

//At this time, the query is local time, that is, the local time of the East Second District.

//Stop querying network time