BC26 Network Registration Process

NB-IoT Module Series

Rev. BC26_Network_Registration_Process_V1.0

Date: 2018-03-19

Status: Preliminary

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About the Document

History

Revision	Date	Author	Description
1.0	2018-03-19	Lebron LIU	Initial

Contents

1 Introduction

This document describes the network registration process of BC26 module under different states, which can help customers quickly use it.

2 Network Registration Process

The following illustrate the network registration process of BC26 under different states through some AT command communication examples.

2.1. Automatic Network Registration Process (Actively Query)

+CPIN : READY	//USIM card is detected
AT+CFUN?	//Read the function level of module.
+CFUN:1	
OK	
AT+CIMI	//Query the IMSI number.
460012345678969	
OK	
AT+CESQ	//Query the signal strength.
+CESQ: 36,99,255,255,12,53	
OK	
AT+QENGINFO=0	//Query the current network status of the module.
+QENGINFOSC: 2506,2,62,"6923252",-84,-10,-74,2,5,"69C9",0,90	
OK	
AT+CGATT?	//Query whether the network is activated. 1 means attached to network successfully, and 0 means has not been attached to network.
+CGATT:1	
OK	
AT+CEREG?	//Query the network registration status. 1 means registered on network, and 2 means searching the network.
+CEREG:0,1	
OK	
AT+CSCON?	//Query the signal connection status. 1 means “Connected”, and 0 means “Idle”.

```
+CSCON:0,1

OK
```

2.2. Automatic Network Registration Process (URC Report)

```
+CPIN : READY                    //USIM card is detected.
AT+CFUN?                         //Read the function level of module.
+CFUN:1

OK
AT+CIMI                          //Query the IMSI number.
460012345678969

OK
AT+CEREG=1                       //Enable network registration URC.
OK
AT+CSCON=1                       //Enable signaling connection status URC.
OK
+CEREG:2                         //Report the URC that the MT is currently trying to attach or searching an
                                 operator to register to.

+CSCON:1                         //Report the URC that the MT is connected.

+CEREG:1                         //Report the URC that the MT is registered.

AT+CESQ                          //Query the signal strength.
+CESQ: 36,99,255,255,12,53

OK
AT+QENGINFO=0                    //Query the module status.
+QENGINFOSC: 2506,2,62,"6923252",-84,-10,-74,2,5,"69C9",0,90

OK
AT+CGATT?                        //Query whether the network is activated. 1 means attached to network
                                 successfully, and 0 means has not been attached to network.

+CGATT:1

OK
AT+CEREG?                        //Query the network registration status. 1 means registered on network, and 2
                                 means searching the network.
```

```
+CEREG:0,1

OK
AT+CSCON?          //Query the signal connection status. 1 means “Connected”, and 0 means “Idle”.
+CSCON:0,1

OK
```

2.3. Automatic Network Registration and PLMN Selecting Process

```
+CPIN : READY      //USIM card is detected
AT+CFUN?           //Read the function level of the module.
+CFUN:1

OK
AT+CIMI            //Query the IMSI number.
460012345678969

OK
AT+COPS=1,2,"46011"   //Specify PLMN
OK
AT+CESQ            //Query the signal strength.
+CESQ: 36,99,255,255,12,53

OK
AT+QENGINFO=0      //Query the module status.
+QENGINFOSC: 2506,2,62,"6923252",-84,-10,-74,2,5,"69C9",0,90

OK
AT+CGATT?          //Query whether the network is activated. 1 means attached to network successfully, and 0 means has not been attached to network.

+CGATT:1

OK
AT+CEREG?          //Query the network registration status. 1 means registered on network, and 2 means searching the network.
+CEREG:0,1

OK
AT+CSCON?          //Query the signal connection status. 1 means “Connected”, and 0 means
```

“Idle”.

```
+CSCON:0,1

OK
```

2.4. Automatic Network Registration and Frequency & Cell Locking Process

```
+CPIN : READY                    //USIM card is detected
AT+CFUN?                         //Read the function level of the module.
+CFUN:1

OK
AT+CIMI                          //Query the IMSI number.
460012345678969

OK
AT+QFRCLLCK=1,2506,2,62          //Specify the requested EARFCN to be locked, requested EARFCN offset and Physical cell ID.
OK
AT+CESQ                          //Query the signal strength.
+CESQ: 36,99,255,255,12,53

OK
AT+QENGINFO=0                    //Query the module status
+QENGINFOSC: 2506,2,62,"6923252",-84,-10,-74,2,5,"69C9",0,90

OK
AT+CGATT?                        //Query whether network is activated. 1 means attached to network successfully, and 0 means has not been attached to network.

+CGATT:1

OK
AT+CEREG?                        //Query the network registration status. 1 means registered on network, and 2 means searching the network.
+CEREG:0,1

OK
AT+CSCON?                        //Query the signal connection status. 1 means “Connected”, and 0 means “Idle”.
```

```
+CSCON:0,1

OK
```

2.5. TCP Socket AT Communication Process

```
AT+QGACT=1,1,“ctnb”,””,””          //Activate a PDN context
                                   //This command needs not to be executed for modules with firmware version of R01A04 or later, as the module will be allocated an IP automatically.
+QGACT=1

OK                                 //Return OK immediately if no error.
+IP:10.53.205.59

+QGACT=1,1,1,1                     //Notify activation result via URC.
AT+CGPADDR=1                       //Query current IP address allocated by network.

+CGPADDR:1,101.43.5.1

OK
AT+QSOC=1,1,1                      //Create a socket.
+QSOC=0
OK
AT+QSOCON=0,8434,"220.180.239.212" //Connect the socket.
OK
AT+QSOSEND=0,5,1234562112          //Send data.
OK
+QSONMI=0,5,1234562112             //Receive data.
AT+QSODIS=0                        //Disconnect the socket.
OK
AT+QSOCL=0                         //Close the socket.
OK
```

2.6. UDP Socket AT Communication Process

```
AT+QGACT=1,1,“ctnb”,””,””          //Activate a PDN context
                                   //This command needs not to be executed for modules with firmware version of R01A04 or later, as the module will be allocated an IP automatically.
```

```
+QGACT=1

OK                                  //Return OK immediately if no error.
+IP:10.53.205.59

+QGACT=1,1,1,1                      //Notify activation result via URC.
AT+CGPADDR=1                        //Query current IP address allocated by network.

+CGPADDR:1,101.43.5.1

OK
AT+QSOC=1,2,1                                   //Create a socket.
+QSOC=0

OK
AT+QSOCON=0,1026, "220.180.239.212"             //Connect the socket.
OK
AT+QSOSEND=0,5,1234562112                       //Send data
OK
+QSONMI=0,5,1234562112                          //Receive data
AT+QSODIS=0                                     //Disconnect the socket.
OK
AT+QSOCL=0                                      //Close the socket.
OK
```

2.7. China Telecom IoT Platform AT Communication Process

```
AT+QGACT=1,1,“ctnb”,””,””       //Activate a PDN context
                                //This command needs not to be executed for modules with firmware version of R01A04 or later, as the module will be allocated an IP automatically.
+QGACT=1

OK                              //Return OK immediately if no error.
+IP:10.53.205.59

+QGACT=1,1,1,1                  //Notify activation result via URC.
AT+CGPADDR=1                    //Query current IP address allocated by network.

+CGPADDR:1,101.43.5.1

OK
```

```
AT+ELMCONF=server,14,117.60.157.137,server_port,4,5683,local_port,4,1222,name,15,866971030002559,domain,4,IPv4,lifetime,5,86400   //Configure & registration to IoT platform.
+ELMCONF=0                                                                                                                          //LWM2M ID
OK
+ELMOBSERVE:0,0,19,0,0                                                                                                              //The IoT platform has observed object 19 which is specified for data communication.
+ELMOBSERVE:0,0,3,0,-1                                                                                                              //Doesn't need to care
+ELMOBSERVE:0,0,1,0,-1                                                                                                              //Doesn't need to care

AT+ELMNOTIFY=0,19,0,0,5,12345                                                                                                       //Notify the data to the IoT platform. The data can be notified in multiple times in string type.
OK

+ELMWRITE: 0,19,0,1,0,D,7,"12345"                                                                                                   //Received write operation

AT+ELMDEL=0                                                                                                                         //Delete the LWM2M to free memory space. If the context is going to be used continuously, then ignore the step.
OK
```

2.8. OneNET Platform AT Communication Process

```
AT+QGACT=1,1,"ctnb","",""                                                                                                           //Activate a PDN context
                                                                                                                                    //This command needs not to be executed for modules with firmware version of R01A04 or later, as the module will be allocated an IP automatically.
+QGACT=1

OK                                                                                                                                  //Return OK immediately if no error.
+IP:10.53.205.59

+QGACT=1,1,1,1                                                                                                                      //Notify activation result via URC.
AT+CGPADDR=1                                                                                                                        //Query current IP address allocated by network.

+CGPADDR:1,101.43.5.1

OK
AT+MIPLCREATE=102,130033f10003f2002105001100000000000000d3138332e3233302e34302e3400044e554c4cf3000cea040000044e554c4c,0,102,0   //Italicized and red colored part represents OneNET server IP in hex.
0                                                                                                                                   //Configured the OneNET context successfully.
OK
/*3403: object id
```

3: instance count
111: instbitmap , 1 represents valid instance , 0 represents invalid instance
4: attribute count, represents how many attributes the instance cover
2: action count , represents how many actions the instance cover */

AT+MIPLADDOBJ=0,3403,3,111,4,2
OK //Added the object successfully. And the instance ID 0/1/2 will be registered.

AT+MIPLOPEN=0 //Send a register request to the OneNET platform.
OK
+MIPLOBSERVER: 0, 18952,3403,0 //The object that has been added and observed by the platform.
+MIPLOBSERVER: 0, 18953,3403,1
+MIPLOBSERVER: 0, 18954,3403,2
//mig_id must match the observe msg_id in observe URC
AT+MIPLNOTIFY=0,18953,3403,1,1,1,2,12,0,0 //Notify the data to the IoT platform. The data can be notified in multiple times.
OK
+MIPLWRITE: 0,28586,3403,1,1,1,2,3039,0 //Write operation.
AT+MIPLWRITERSP=0 ,28586 ,1,0 //Write result.
OK
+MIPLREAD: 0,28587,3403,0,1 //The Application Server has sent a read request to the module, and wants to read the object ID (3403), instance ID (0) and resource ID (1) values.
AT+MIPLREADRSP=0,28587,3403,0,1,2,6,303132333435,0,0
OK
AT+MIPLCLOSE=0 //Send a deregister request to the OneNET platform.
OK
AT+MIPLDELOBJ=0,3403 //Delete a LWM2M object.
OK
AT+MIPLDELETE=0 //Delete a communication suite instance.
OK