BC35-G&BC28&BC95 R2.0 OneNET Application Note

NB-IoT Module Series

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History

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1 Introduction

LwM2M (Lightweight Machine to Machine) is a secure, efficient and deployable client-server protocol for managing resource constrained devices on a variety of networks. LwM2M uses a modern architectural design based on REST, defines an extensible resource and data model and reuses and builds on an efficient secure data transfer standard called the Constrained Application Protocol (CoAP). LwM2M is a profile for device services based on CoAP (RFC 7252). LwM2M defines a simple object model and a number of interfaces and operations for device management.

This document mainly introduces how to use the LwM2M function of Quectel BC35-G, BC28 and BC95 R2.0 modules through AT commands to connect to the OneNET platform.

NOTES

1. Only BC35-G, BC28 and BC95 R2.0 modules with firmware version ended with "*_ONT*" support communication with OneNET platform.
2. When the Huawei IoT platform is not used, please disable the platform registration function with **AT+QREGSWT=2**.

2 OneNET Data Interaction Mechanism

This chapter gives the data interaction mechanism of OneNET platform.

Figure 1: OneNET Data Interaction Diagram

3 OneNET Related AT Commands

This chapter presents the AT commands for operating OneNET function.

3.1. AT Command Syntax

Table 1: Types of AT Commands and Responses

Test Command	**AT+<*x*>=?**	This command returns the list of parameters and value ranges set by the corresponding Write Command or internal processes.
Read Command	**AT+<*x*>?**	This command returns the currently set value of the parameter or parameters.
Write Command	**AT+<x>=<…>**	This command sets the user-definable parameter values.
Execution Command	**AT+<x>**	This command reads non-variable parameters affected by internal processes in the UE.

3.2. Description of OneNET Related AT Commands

3.2.1. AT+MIPLCONFIG OneNET Access Configuration Command

The command is used to configure bootstrap mode and bootstrap server address or LwM2M server address. It can also be used to set the parameter ACK_TIMEOUT of CoAP protocol. MAX_TRANSMIT_WAIT of CoAP protocol implemented by the UE = ACK_TIMEOUT * ((2$^{(4+1)}$) - 1).

If ACK_TIMEOUT is not configured, the default set will be used. Please refer to ***Chapter 7*** for possible **<err>** codes.

AT+MIPLCONFIG	**OneNET Access Configuration Command**
Test Command **AT+MIPLCONFIG=?**	Response **+MIPLCONFIG: <mode>,<parameter1>[,<parameter2>]** **OK**

Read Command **AT+MIPLCONFIG?**	Response **+MIPLCONFIG:<mode>,<ip>,<port>** **+MIPLCONFIG:<mode>,<rsp_timeout>** **+MIPLCONFIG:<mode>,<obs_autoack>** **OK** If there is any error, response: **ERROR** Or **+CME ERROR: <err>**
Write Command **AT+MIPLCONFIG=<mode>,<parameter1>[,<parameter2>]**	Response **OK** If there is any error, response: **ERROR** Or **+CME ERROR: <err>**
Maximum Response Time	300ms

Parameter

<mode>	Option mode 0 Disable bootstrap, and configure LwM2M server IP and port. 1 Enable bootstrap, and configure bootstrap server IP and port. The default bootstrap server address is 183.230.40.39:5683. 2 Set the parameter ACK_TIMEOUT of CoAP protocol. The default value of ACK_TIMEOUT is 2 seconds. 3 Set whether to enable the module to automatically respond to observe requests.

<mode>	**<parameter1>**	**<parameter2>**
0	**<ip>**	**<port>**
1	**<ip>**	**<port>**
2	1	**<rsp_timeout>**
3	**<obs_autoack>**	

<ip>	When <mode>=0, <ip> is LwM2M server IP address. When <mode>=1, <port> is bootstrap server IP address.
<port>	When <mode>=0, <port> is LwM2M server port. When <mode>=1, <port> is bootstrap server port.
<rsp_timeout>	Value of ACK_TIMEOUT. Range: 2-20. Unit: second. Default value: 2.
<obs_autoack>	Set whether to enable the module to automatically respond to observe requests. 0 Disable automatic observe request responding . 1 Enable automatic observe request responding and TE should not respond to

the request through **AT+MIPLOBSERVERSP** command.

NOTES

1. The command should be used before creating communication instance through **AT+MIPLCREATE** command.
2. Parameters of the command will not be saved.

3.2.2. AT+MIPLCREATE Create a OneNET Communication Suite Instance

The command is used to create an instance of OneNET communication suite. Please refer to ***Chapter 7*** for possible **<err>** codes.

AT+MIPLCREATE Create a OneNET Communication Suite Instance	
Execution Command **AT+MIPLCREATE**	Response **+MIPLCREATE:<ref>** **OK** If there is any error, response: **ERROR** Or **+CME ERROR: <err>**
Maximum Response Time	300ms

Parameter

<ref>	Instance ID of OneNET communication suite.

3.2.3. AT+MIPLDELETE Delete a OneNET Communication Suite Instance

The command is used to delete a OneNET communication suite instance. Please refer to ***Chapter 7*** for possible **<err>** codes.

AT+MIPLDELETE Delete a OneNET Communication Suite Instance	
Test Command **AT+MIPLDELETE=?**	Response **+MIPLDELETE: <ref>** **OK**
Write Command **AT+MIPLDELETE=<ref>**	Response **OK**

	If there is any error, response: **ERROR** Or **+CME ERROR: <err>**
Maximum Response Time	3s

Parameter

<ref>	Instance ID of OneNET communication suite.

3.2.4. AT+MIPLVER Query the Current OneNET Communication Suite Version

The command is used to query the current OneNET communication suite version.

AT+MIPLVER Query the Current OneNET Communication Suite Version	
Read Command **AT+MIPLVER?**	Response **+MIPLVER:<version>** **OK**
Maximum Response Time	300ms

Parameter

<version>	The current OneNET communication suite version.

3.2.5. AT+MIPLADDOBJ Add a LwM2M Object

The command is used to add a LwM2M object. Please refer to ***Chapter 7*** for possible **<err>** codes.

AT+MIPLADDOBJ Add a LwM2M Object	
Test Command **AT+MIPLADDOBJ=?**	Response **+MIPLADDOBJ:<ref>,<objId>,<insCount>,<insBitmap>,<attrCount>,<actCount>** **OK**
Write Command **AT+MIPLADDOBJ=<ref>,<objId>,<insCount>,<insBitmap>,<attrCount>,<ac**	Response **OK**

tCount>	If there is any error, response: **ERROR** Or **+CME ERROR: <err>**
Maximum Response Time	300ms

Parameter

<ref>	Instance ID of OneNET communication suite.
<objId>	Object identifier. If the object ID does not exist, the module will return an error.
<insCount>	Instance count.
<insBitmap>	Instance bitmap. A string marked with double quotation marks. For example, if **<insCount>**=4, and the **<insBitmap>**="1101", it means that the instance ID 0, 1, 3 will be registered, while the instance ID 2 will not be registered.
<attrCount>	Attribute count, which indicates the count of readable and/or writeable resources.
<actCount>	Action count, which indicates the count of executable resources.

3.2.6. AT+MIPLDELOBJ Delete a LwM2M Object

The command is used to delete a LwM2M object. Please refer to ***Chapter 7*** for possible **<err>** codes.

AT+MIPLDELOBJ Delete a LwM2M Object	
Test Command **AT+MIPLDELOBJ=?**	Response **+MIPLDELOBJ: <ref>,<objId>** **OK**
Write Command **AT+MIPLDELOBJ=<ref>,<objId>**	Response **OK** If there is any error, response: **ERROR** Or **+CME ERROR: <err>**
Maximum Response Time	300ms

Parameter

<ref>	Instance ID of OneNET communication suite.
<objId>	Object identifier. If the object ID is not existed, the module will return an error.

3.2.7. AT+MIPLOPEN Send Register Request

The command is used to send register request to OneNET platform. Please refer to ***Chapter 7*** for possible **<err>** codes.

AT+MIPLOPEN Send Register Request	
Test Command **AT+MIPLOPEN=?**	Response **+MIPLOPEN: <ref>,<lifetime>[,<timeout>]** **OK**
Write Command **AT+MIPLOPEN=<ref>,<lifetime>[,<timeout>]**	Response **OK** If there is any error, response: **ERROR** Or **+CME ERROR: <err>**
Maximum Response Time	300ms

Parameter

<ref>	Instance ID of OneNET communication suite.
<lifetime>	Device lifetime. Range: 16-268435454. Unit: second.
<timeout>	Timeout of registration. Range: 30-65535. Unit: second.

3.2.8. AT+MIPLCLOSE Send Deregister Request

The command is used to send deregister request to OneNET platform. Please refer to ***Chapter 7*** for possible **<err>** codes.

AT+MIPLCLOSE Send Deregister Request	
Test Command **AT+MIPLCLOSE=?**	Response **+MIPLCLOSE: <ref>** **OK**
Write Command **AT+MIPLCLOSE=<ref>**	Response **OK** If there is any error, response: **ERROR** Or **+CME ERROR: <err>**

Maximum Response Time	3s

Parameter

<ref>	Instance ID of OneNET communication suite.

3.2.9. AT+MIPLDISCOVERRSP Respond to the Discover Request

The command is used to respond to the discover request from OneNET platform. Please refer to ***Chapter 7*** for possible **<err>** codes.

AT+MIPLDISCOVERRSP Respond to the Discover Request	
Test Command **AT+MIPLDISCOVERRSP=?**	Response **+MIPLDISCOVERRSP: <ref>,<msgId>,<result>[,<length>,<valuestring>[,<raiMode>]]** **OK**
Write Command **AT+MIPLDISCOVERRSP=<ref>,<msgId>,<result>[,<length>,<valuestring>[,<raiMode>]]**	Response **OK** If there is any error, response: **ERROR** Or **+CME ERROR: <err>**
Maximum Response Time	300ms

Parameter

<ref>	Instance ID of OneNET communication suite.		
<msgId>	The message identifier, which comes from the URC "+ MIPLDISCOVER:".		
<result>	The result of the discover request. The result codes are as follows:		
	Result code	CoAP response code	Description
	1	2.05	Content, indicating the correct result
	11	4.00	Bad request
	12	4.01	Unauthorized
	13	4.04	Not found
	14	4.05	Method not allowed
	15	4.06	Not acceptable
<length>	The length of **<valuestring>**.		
<valuestring>	A string which includes the attributes of the object and should be marked with double		

	quotation marks. Each attribute should be split with semicolon, such as "1101;1102; 1103". The count of attributes should not be more than the sum of **<attrCount>** and **<actCount>** in command **AT+MIPLADDOBJ**.
<raiMode>	Integer type. Specifies the flag of RAI (Release Assistant Indication) of message transmission. Values of this argument are in hex format: 0x200 Release Indicator: indicates release after the message 0x400 Release Indicator: indicates release after the message has been replied. If no flag is set, a value of 0 may be provided if necessary.

3.2.10. AT+MIPLOBSERVERSP Respond to the Observe Request

The command is used to respond to the observe request from OneNET platform or Application Server, when automatic observe request responding is disabled. Please refer to ***Chapter 7*** for possible **<err>** codes.

AT+MIPLOBSERVERSP Respond to the Observe Request	
Test Command **AT+MIPLOBSERVERSP=?**	Response **+MIPLOBSERVERSP: <ref>,<msgId>,<result>[,<raiMode>]** **OK**
Write Command **AT+MIPLOBSERVERSP=<ref>,<msgId>,<result>[,<raiMode>]**	Response **OK** If there is any error, response: **ERROR** Or **+CME ERROR: <err>**
Maximum Response Time	300ms

Parameter

<ref>	Instance ID of OneNET communication suite.		
<msgId>	The message identifier, which comes from the URC “+ MIPLOBSERVE:”.		
<result>	The result of observe. The result codes are as follows:		
	Result code	CoAP response code	Description
	1	2.05	Content, indicating the correct result
	11	4.00	Bad request
	12	4.01	Unauthorized
	13	4.04	Not found
	14	4.05	Method not allowed
	15	4.06	Not acceptable
<raiMode>	Integer type. Specifies the flag of RAI (Release Assistant Indication) of message		

	transmission. Values of this argument are in hex format: 0x200 Release Indicator: indicates release after the message 0x400 Release Indicator: indicates release after the message has been replied. If no flag is set, a value of 0 may be provided if necessary.

3.2.11. AT+MIPLREADRSP Respond to the Read Request

The command is used to respond to the read request from OneNET platform or Application Server. Please refer to ***Chapter 7*** for possible **<err>** codes.

AT+MIPLREADRSP Respond to the Read Request	
Test Command **AT+MIPLREADRSP=?**	Response **+MIPLREADRSP: <ref>,<msgId>,<result>[,<objId>,<insId>,<resId>,<valueType>,<len>,<value>,<index>,<flag>[,<raiMode>]]** **OK**
Write Command **AT+MIPLREADRSP=<ref>,<msgId>,<result>[,<objId>,<insId>,<resId>,<valueType>,<len>,<value>,<index>,<flag>[,<raiMode>]]**	Response **OK** If there is any error, response: **ERROR** Or **+CME ERROR: <err>**
Maximum Response Time	300ms

Parameter

<ref>	Instance ID of OneNET communication suite.		
<msgId>	The message identifier, which comes from the URC “+MIPLREAD:”.		
<result>	The result of read request. The result codes are as follows:		
	Result code	CoAP response code	Description
	1	2.05	Content, indicating the correct result
	11	4.00	Bad request
	12	4.01	Unauthorized
	13	4.04	Not found
	14	4.05	Method not allowed
	15	4.06	Not acceptable
<objId>	Object identifier.		
<insId>	The instance identifier, which comes from the URC “+MIPLREAD:”.		
<resId>	The resource identifier, which comes from the URC “+MIPLREAD:”.		
<valueType>	Value types.		

	1 String 2 Opaque 3 Integer 4 Float 5 Boolean
<len>	Value length. Unit: byte. When **<valueType>** is String, it is the string length of **<value>**. When **<valueType>** is Opaque, it is the hex string length of **<value>**. When **<valueType>** is Integer, it is 2, 4, or 8. When **<valueType>** is Float, it is 4. When **<valueType>** is Boolean, it is 1.
<value>	The value. When **<valueType>** is String, it is in string format, and the string should be marked with double quotation marks. When **<valueType>** is Opaque, it is in hex string format. When **<valueType>** is Integer/Float/Boolean, it is an Integer/Float/Boolean type text.
<index>	The index number of the data. If the data comprises several messages, it should be split into several parts. If it is split into N parts, the order number of **<index>** is N-1 to 0 in descending order, and the AT command is called in the order from the largest to the smallest number. If **<index>** is 0, it means this is the last message of the data.
<flag>	The message indication. The range is 0-2. **<flag>**=0 Means the last message of the **<value>**. **<flag>**=1 Means the first message of the **<value>**. **<flag>**=2 Means the middle message of the **<value>**. Only **<flag>**=0 is supported in this version.
<raiMode>	Integer type. Specifies the flag of RAI (Release Assistant Indication) of message transmission. Values of this argument are in hex format: 0x200 Release Indicator: indicates release after the message 0x400 Release Indicator: indicates release after the message has been replied. If no flag is set, a value of 0 may be provided if necessary.

NOTE

The command is used to make the module respond to the read request, and the total response data length should be less than 1024 bytes. If the value type is Opaque (**<valueType>**=2), the data length is counted as 2***<len>**.

3.2.12. AT+MIPLWRITERSP Respond to the Write Request

The command is used to respond to the write request from the OneNET platform or Application Server. Please refer to ***Chapter 7*** for possible **<err>** codes.

AT+MIPLWRITERSP Respond to the Write Request	
Test Command **AT+MIPLWRITERSP=?**	Response **+MIPLWRITERSP: <ref>,<msgId>,<result>[,<raiMode>]** **OK**
Write Command **AT+MIPLWRITERSP=<ref>,<msgId>,<result>[,<raiMode>]**	Response **OK** If there is any error, response: **ERROR** Or **+CME ERROR: <err>**
Maximum Response Time	300ms

Parameter

<ref>	Instance ID of OneNET communication suite.
<msgId>	The message identifier, which comes from the URC "+MIPLWRITE:".
<result>	The result of write request. The result codes are as follows:

Result code	CoAP response code	Description
2	2.04	Changed, indicating the correct result
11	4.00	Bad request
12	4.01	Unauthorized
13	4.04	Not found
14	4.05	Method not allowed

<raiMode>	Integer type. Specifies the flag of RAI (Release Assistant Indication) of message transmission. Values of this argument are in hex format: 0x200 Release Indicator: indicates release after the message 0x400 Release Indicator: indicates release after the message has been replied. If no flag is set, a value of 0 may be provided if necessary.

3.2.13. AT+MIPLEXECUTERSP Respond to the Execute Request

The command is used to respond to the execute request from OneNET platform or Application Server. Please refer to ***Chapter 7*** for possible **<err>** codes.

AT+MIPLEXECUTERSP Respond to the Execute Request	
Test Command **AT+MIPLEXECUTERSP=?**	Response **+MIPLEXECUTERSP: <ref>,<msgId>,<result>[,<raiMode>]** **OK**

Write Command **AT+MIPLEXECUTERSP=<ref>,<msgId>,<result>[,<raiMode>]**	Response **OK** If there is any error, response: **ERROR** Or **+CME ERROR: <err>**
Maximum Response Time	300ms

Parameter

<ref>	Instance ID of OneNET communication suite.
<msgId>	The message identifier, which comes from the URC "+MIPLEXECUTE:".
<result>	The result of execute request. The result codes are as follows:

Result code	CoAP response code	Description
2	2.04	Changed, indicating the correct result
11	4.00	Bad request
12	4.01	Unauthorized
13	4.04	Not found
14	4.05	Method not allowed

<raiMode>	Integer type. Specifies the flag of RAI (Release Assistant Indication) of message transmission. Values of this argument are in hex format: 0x200 Release Indicator: indicates release after the message 0x400 Release Indicator: indicates release after the message has been replied. If no flag is set, a value of 0 may be provided if necessary.

3.2.14. AT+MIPLPARAMETERRSP Respond to the Write-Attributes Request

The command is used to respond to the write-attributes request from OneNET platform or Application Server. Please refer to ***Chapter 7*** for possible **<err>** codes.

AT+MIPLPARAMETERRSP Respond to the Write-Attributes Request	
Test Command **AT+MIPLPARAMETERRSP=?**	Response **+MIPLPARAMETERRSP: <ref>,<msgId>,<result>[,<raiMode>]** **OK**
Write Command **AT+MIPLPARAMETERRSP=<ref>,<msgId>,<result>[,<raiMode>]**	Response **OK** If there is any error, response: **ERROR**

	Or **+CME ERROR: <err>**
Maximum Response Time	300ms

Parameter

<ref>	Instance ID of OneNET communication suite.
<msgId>	The message identifier, which comes from the URC "+MIPLPARAMETER:".
<result>	The result of write-attributes operation. The result codes are as follows: Result code / CoAP response code / Description 2 / 2.04 / Changed, indicating the correct result 11 / 4.00 / Bad request 12 / 4.01 / Unauthorized 13 / 4.04 / Not found 14 / 4.05 / Method not allowed
<raiMode>	Integer type. Specifies the flag of RAI (Release Assistant Indication) of message transmission. Values of this argument are in hex format: 0x200 Release Indicator: indicates release after the message 0x400 Release Indicator: indicates release after the message has been replied. If no flag is set, a value of 0 may be provided if necessary.

3.2.15. AT+MIPLNOTIFY Notify the Data to OneNET Platform or Application Server

The command is used to notify the data to OneNET platform or Application Server. Please refer to ***Chapter 7*** for possible **<err>** codes.

AT+MIPLNOTIFY Notify the Data to OneNET Platform or Application Server	
Test Command **AT+MIPLNOTIFY=?**	Response **+MIPLNOTIFY: <ref>,<msgId>,<objId>,<insId>,<resId><valueType>,<len>,<value>,<index>,<flag>[,<ackid>[,<raiMode>]]** **OK**
Write Command **AT+MIPLNOTIFY=<ref>,<msgId>,<objId>,<insId>,<resId>,<valueType>,<len>,<value>,<index>,<flag>[,<ackid>[,<raiMode>]]**	Response **OK** If there is any error, response: **ERROR** Or **+CME ERROR: <err>**
Maximum Response Time	300ms

Parameter

<ref>	Instance ID of OneNET communication suite.
<msgId>	The message identifier, which comes from the URC “+MIPLOBSERVE:”.
<objId>	Object identifier.
<insId>	The instance identifier, which comes from the URC “+MIPLOBSERVE:”.
<resId>	The resource identifier, which comes from the URC “+MIPLOBSERVE:”.
<valueType>	Value types. 1 String 2 Opaque 3 Integer 4 Float 5 Boolean
<len>	Value length. Unit: byte. When **<valueType>** is String, it is the string length of **<value>**. When **<valueType>** is Opaque, it is the hex string length of **<value>**. When **<valueType>** is Integer, it is 2, 4, or 8. When **<valueType>** is Float, it is 4. When **<valueType>** is Boolean, it is 1.
<value>	The value. When **<valueType>** is String, it is in string format, and the string should be marked with double quotation marks. When **<valueType>** is Opaque, it is in hex string format. When **<valueType>** is Integer/Float/Boolean, it is an Integer/Float/Boolean type text.
<index>	The index number of the data. If the data comprises several messages, it should be split into several parts. If it is split into N parts, the order number of **<index>** is N-1 to 0 in descending order, and the AT command is called in the order from the largest to the smallest number. If **<index>** is 0, it means this is the last message of the data.
<flag>	The message indication. The range is 0-2. **<flag>**=0 Means the last message of the **<value>**. **<flag>**=1 Means the first message of the **<value>**. **<flag>**=2 Means the middle message of the **<value>**. Only **<flag>**=0 is supported in this version.
<ackid>	Integer type, range: 0-65535. 0 The data will be sent in Non-confirmable (NON) message. 1-65535 The data will be sent in Confirmable (CON) message and the result of message sent will be indicated by "+MIPLEVENT" URC.
<raiMode>	Integer type. Specifies the flag of RAI (Release Assistant Indication) of message transmission. Values of this argument are in hex format: 0x200 Release Indicator: indicates release after the message. 0x400 Release Indicator: indicates release after the message has been replied.

	When **<ackid>** is nonzero, only **<raiMode>**=0x400 is supported. If no flag is set, a value of 0 may be provided if necessary.

NOTES

1. This command is used to notify data. The total data length should be less than 1024 bytes. If the value type is opaque, the data length is counted as 2***<len>**.
2. If the data comprises several messages, the messages which have already been sent in the first place will be sent out as usual until a message error is reported.

3.2.16. AT+MIPLUPDATE Send Update Request

The command is used to send an update request to update lifetime and objects. Please refer to ***Chapter 7*** for possible **<err>** codes.

AT+MIPLUPDATE Send Update Request	
Test Command **AT+MIPLUPDATE=?**	Response **+MIPLUPDATE: <ref>,<lifetime>,<withObjectFlag>[,<raiMode>]** **OK**
Write Command **AT+MIPLUPDATE=<ref>,<lifetime>,<withObjectFlag>[,<raiMode>]**	Response **OK** If there is any error, response: **ERROR** Or **+CME ERROR: <err>**
Maximum Response Time	300ms

Parameter

<ref>	Instance ID of OneNET communication suite.
<lifetime>	Updated lifetime value. The range is 0 or 16-268435454. Unit: second. “0” means that lifetime is 86400 seconds.
<withObjectFlag>	Whether to update with objects list. 0 Update without objects list. 1 Update with objects list.
<raiMode>	Integer type. Specifies the flag of RAI (Release Assistant Indication) of message transmission. Values of this argument are in hex format: 0x400 Release Indicator: indicates release after the message has been replied. If no flag is set, a value of 0 may be provided if necessary.

4 OneNET Related URCs

This chapter shows OneNET related URCs and their descriptions.

Table 2: OneNET Related URCs

Index	URC	Description
[1]	**+MIPLDISCOVER: <ref>,<msgId>,<objId>**	When the OneNET platform sends a discover request, the module will report the URC when it receives the request.
[2]	**+MIPLOBSERVE: <ref>,<msgId>,<flag>,<objId>,<insId>,<resId>**	When the OneNET platform or Application Server sends an observe request, the module will report the URC once it receives such a request.
[3]	**+MIPLREAD: <ref>,<msgId>,<objId>,<insId>,<resId>**	When the OneNET platform or Application Server sends a read request, the module will report the URC when it receives the request.
[4]	**+MIPLWRITE: <ref>,<msgId>,<objId>,<insId>,<resId>,<valueType>,<len>,<value>,<flag>,<index>**	When the OneNET platform or Application Server sends a write request, the module will report the URC once it receives such a request.
[5]	**+MIPLEXECUTE: <ref>,<msgId>,<objId>,<insId>,<resId>[,<len>,<arguments>]**	When the OneNET platform or Application Server sends an execute request, the module will report the URC once it receives such a request.
[6]	**+MIPLPARAMETER: <ref>,<msgId>,<objId>,<insId>,<resId>,<len>,<parameter>**	When the OneNET platform or Application Server sends a write-attributes request, the module will report the URC once it receives such a request.
[7]	**+MIPLEVENT: <ref>,<evtid>[,<extend>][,<ackid>]**	Report the URC when there is an event to be notified to TE.

4.1. "+MIPLDISCOVER" URC to Notify the TE to Respond to the Discover Request

The URC is mainly used to notify the TE to respond to the discover request from OneNET platform. The TE should respond to the request with **AT+MIPLDISCOVERRSP** in 10 seconds (starting from the output of URC), and the response should begin once the URC is completely exported.

"+MIPLDISCOVER" URC to Notify the TE to Respond to the Discover Request	
URC Format: **+MIPLDISCOVER: <ref>,<msgId>,<objId>**	Notify the TE to respond to the discover request from OneNET platform.

Parameter

<ref>	Instance ID of OneNET communication suite.
<msgId>	The message identifier of packet.
<objId>	The object identifier that is received from OneNET platform.

4.2. "+MIPLOBSERVE" URC to Notify the TE to Respond to the Observe Request

The URC is mainly used to notify the TE to respond to the observe request from OneNET platform or Application Server. If automatic observe request responding is disabled, the TE should respond to the request with **AT+MIPLOBSERVERSP** in 10 seconds (starting from the output of URC), and the response should begin once the URC is completely exported.

"+MIPLOBSERVE" URC to Notify the TE to Respond to the Observe Request	
URC Format: **+MIPLOBSERVE: <ref>,<msgId>,<flag>,<objId>,<insId>,<resId>**	Notify the TE that there is an observe request from OneNET platform or Application Server.

Parameter

<ref>	Instance ID of OneNET communication suite.
<msgId>	The message identifier of packet.
<flag>	Indicates whether or not to observe. 0 Cancel observe 1 Observe

<objId>	The object identifier that is received from OneNET platform or Application Server.
<insId>	The instance identifier that is received from OneNET platform or Application Server. "-1" indicates observe or cancel observe all resources under all instances.
<resId>	The resource identifier that is received from OneNET platform or Application Server. "-1" indicates observe or cancel observe all resources under the instance.

4.3. "+MIPLREAD" URC to Notify the TE to Respond to the Read Request

The URC is mainly used to notify the TE to respond to the read request from OneNET platform or Application server. The TE should respond to the request with **AT+MIPLREADRSP** in 10 seconds (starting from the output of URC), and the response should begin once the URC is completely exported.

"+MIPLREAD" URC to Notify the TE to Respond to the Read Request	
URC Format: **+MIPLREAD: <ref>,<msgId>,<objId>,<insId>,<resId>**	Notify the TE to respond to the read request from OneNET platform or Application Server.

Parameter

<ref>	Instance ID of OneNET communication suite.
<msgId>	The message identifier of packet.
<objId>	The object identifier that is received from OneNET platform or Application Server.
<insId>	The instance identifier that is received from OneNET platform or Application Server. "-1" indicates read all resources under the object.
<resId>	The resource identifier that is received from OneNET platform or Application Server. "-1" indicates read all resources under the instance.

4.4. "+MIPLWRITE" URC to Notify the TE to Respond to the Write Request

The URC is mainly used to notify the TE to respond to the write request from OneNET platform or Application Server. The TE should respond to the request with **AT+MIPLWRITERSP** in 10 seconds (starting from the output of URC), and the response should begin once the URC is completely exported.

"+MIPLWRITE" URC to Notify the TE to Respond to the Write Request	
URC Format: **+MIPLWRITE: <ref>,<msgId>,<objId>,<insId>,<resId>,<valueType>,<len>,<value>,<flag>,<index>**	Notify the TE to respond to the write request from OneNET platform or Application Server.

Parameter

<ref>	Instance ID of OneNET communication suite.
<msgId>	The message identifier of packet.
<objId>	The object identifier received from OneNET platform or Application Server.
<insId>	The instance identifier received from OneNET platform or Application Server.
<resId>	The resource identifier received from OneNET platform or Application Server.
<valueType>	Value types (only shows in opaque currently). 1 String 2 Opaque 3 Integer 4 Float 5 Boolean
<len>	Value length. Unit: byte.
<value>	The value received from OneNET platform or Application Server, in hex string format.
<flag>	The message indication. The range is 0-2. **<flag>**=0 Means the last message of the **<value>**. **<flag>**=1 Means the first message of the **<value>**. **<flag>**=2 Means the middle message of the **<value>**. Only **<flag>**=0 is supported in this version.
<index>	The index number of the write request. If the write request comprises several messages, it should be split into several parts. If it is split into N parts, the order number of **<index>** is N-1 to 0 in descending order, and the URC is sorted from the largest to the smallest number. If **<index>** is 0, it means that this is the last message of the write request.

NOTE

The data length of write operation from Application Server should be less than 1000 bytes, otherwise there may be an operation failure.

4.5. "+MIPLEXECUTE" URC to Notify the TE to Respond to the Execute Request

The URC is mainly used to notify the TE to respond to the execute request from OneNET platform or Application Server. The TE should respond to the request with **AT+MIPLEXECUTERSP** in 10 seconds (starting from the output of URC), and the response should begin once the URC is completely exported.

"+MIPLEXECUTE" URC to Notify the TE to Respond to the Execute Request	
URC Format: **+MIPLEXECUTE: <ref>,<msgId>,<objId>,<insId>,<resId>[,<len>,<arguments>]**	Notify the TE to respond the execute request from OneNET platform or Application Server.

Parameter

<ref>	Instance ID of OneNET communication suite.
<msgId>	The message identifier of packet.
<objId>	The object identifier that is received from OneNET platform or Application Server.
<insId>	The instance identifier that is received from OneNET platform or Application Server.
<resId>	The resource identifier that is received from OneNET platform or Application Server.
<len>	The length of **<arguments>**.
<arguments>	The arguments of execute operation in string type.

NOTE

The **<arguments>** length of execute operation from Application Server should be less than 1000 bytes, otherwise there may be an operation failure.

4.6. "+MIPLPARAMETER" URC to Notify the TE to Respond to the Write-Attributes Request

The URC is mainly used to notify the TE to respond to the write-attributes request from OneNET platform or Application Server. The TE should respond to the request with **AT+MIPLPARAMETERRSP** in 10 seconds (starting from the output of URC), and the response should begin once the URC is completely exported.

"+MIPLPARAMETER" URC to Notify the TE to Respond to the Write-Attributes Request	
URC Format: **+MIPLPARAMETER: <ref>,<msgid>,<objId>,<insId>,<resId>,<len>,<parameter>**	Notify the TE to respond to the Write-Attributes request from OneNET platform or Application Server.

Parameter

<ref>	Instance ID of OneNET communication suite.

<msgId>	The message identifier of packet.
<objId>	The object identifier that is received from OneNET platform or Application Server.
<insId>	The instance identifier that is received from OneNET platform or Application Server. "-1" indicates the **<parameter>** apply to all resources under the object.
<resId>	The resource identifier that is received from OneNET platform or Application Server. "-1" indicates the **<parameter>** apply to all resources under the instance.
<len>	The length of **<parameter>**.
<parameter>	The parameter of write-attributes operation in string type.

4.7. "+MIPLEVENT" URC to Notify the TE of Events

The URC is mainly used to notify the TE of events.

"+MIPLEVENT" URC to Notify the TE of Events	
URC Format: **+MIPLEVENT: <ref>,<evtid>[,<extend>][,<ackid>]**	Notify the TE of events.

Parameter

<ref>	Instance ID of OneNET communication suite.
<evtid>	Event identifier. 1 EVENT_BOOTSTRAP_START 2 EVENT_BOOTSTRAP_SUCCESS 3 EVENT_BOOTSTRAP_FAILED 4 EVENT_CONNECT_SUCCESS 5 EVENT_CONNECT_FAILED 6 EVENT_REG_SUCCESS 7 EVENT_REG_FAILED 8 EVENT_REG_TIMEOUT 9 EVENT_LIFETIME_TIMEOUT 10 EVENT_STATUS_HALT 11 EVENT_UPDATE_SUCCESS 12 EVENT_UPDATE_FAILED 13 EVENT_UPDATE_TIMEOUT 14 EVENT_UPDATE_NEED 15 EVENT_DEREG_DONE 20 EVENT_RESPONSE_FAILED 21 EVENT_RESPONSE_SUCCESS 25 EVENT_NOTIFY_FAILED 26 EVENT_NOTIFY_SUCCESS

	40 EVENT_FIRMWARE_DOWNLOADING 41 EVENT_FIRMWARE_DOWNLOAD_FAILED 42 EVENT_FIRMWARE_DOWNLOADED 43 EVENT_FIRMWARE_UPDATING 44 EVENT_FIRMWARE_UPDATE_SUCCESS 45 EVENT_FIRMWARE_UPDATE_FAILED 46 EVENT_FIRMWARE_UPDATE_OVER 47 EVENT_FIRMWARE_DOWNLOAD_DISCONNECT 48 EVENT_FIRMWARE_ERASE_SUCCESS 49 EVENT_FIRMWARE_ERASE_FAIL
<extend>	Extended parameter. When **<evtid>** is 20, it shows the message ID of the response command. When **<evtid>** is 14, it shows the remaining time of lifetime in seconds.
<ackid>	Integer type. Range: 1-65535. Acknowledgement identifier of the CON message notified through **AT+MIPLNOTIFY**.

5 Examples

This chapter exhibits examples about how to use OneNET related AT commands.

5.1. Access Configuration

This example shows how to configure bootstrap mode and bootstrap server address, how to configure access server and how to set the parameter ACK_TIMEOUT of CoAP protocol.

```
AT+MIPLCONFIG=?
+MIPLCONFIG: <mode>,<parameter1>[,<parameter2>]

OK

//Enable bootstrap and configure bootstrap server IP and port.
AT+MIPLCONFIG=1,183.230.40.39,5683
OK

AT+MIPLCONFIG?
+MIPLCONFIG:1,183.230.40.39,5683
+MIPLCONFIG:2,2
+MIPLCONFIG:3,1

OK

//Disable bootstrap and configure access server IP and port.
AT+MIPLCONFIG=0,183.230.40.40,5683
OK

AT+MIPLCONFIG?
+MIPLCONFIG:0,183.230.40.40,5683
+MIPLCONFIG:2,2
+MIPLCONFIG:3,1

OK

//Set ACK_TIMEOUT value to nine seconds.
```

```
AT+MIPLCONFIG=2,1,9
OK

AT+MIPLCONFIG?
+MIPLCONFIG:0,183.230.40.40,5683
+MIPLCONFIG:2,9
+MIPLCONFIG:3,1

OK
```

5.2. Register and Discover Operations

5.2.1. Register and Discover Operations (Without Auto Subscription)

The following example illustrates register and discover operations under the scenario that the auto subscription function of the OneNET platform has been disabled.

```
//Create a communication suite instance with a single command, with bootstrap mode enabled.
AT+MIPLCREATE
+MIPLCREATE:0                    //Created the communication suite instance successfully.

OK

//Add a LwM2M object.
AT+MIPLADDOBJ=0,3311,2,"11",4,2
OK                               //Added the object successfully. And the instance ID 0 and 1
                                  will be registered.

//Send register request to the OneNET platform.
AT+MIPLOPEN=0,600,60
OK

+MIPLEVENT: 0,1
+MIPLEVENT: 0,2
+MIPLEVENT: 0,4
+MIPLEVENT: 0,6                  //Registered successfully.
+MIPLDISCOVER: 0,26384,3311       //Received resource discover request.

//Respond to the resource discover request with resource ID list.
AT+MIPLDISCOVERRSP=0,26384,1,19,"5850;5851;5706;5805"
OK

AT+MIPLDELOBJ=0,3311             //Delete a LwM2M object.
```

```
OK

//Send deregister request to OneNET platform.
AT+MIPLCLOSE=0
OK

+MIPLEVENT: 0,15                    //Deregistered successfully.

//Delete the communication suite instance.
AT+MIPLDELETE=0
OK                                  //Deleted the communication suite instance successfully.
```

5.2.2. Register and Discover Operations (With Auto Subscription)

The following example illustrates register and discover operations under the scenario that the auto subscription function of the OneNET platform has been enabled.

```
//Create a communication suite instance with a single command, with default setting.
AT+MIPLCONFIG?
+MIPLCONFIG:1,183.230.40.39,5683
+MIPLCONFIG:2,2
+MIPLCONFIG:3,1                     //Enable the module to automatically respond to the observe
                                      request.

OK

AT+MIPLCREATE
+MIPLCREATE:0                       //Created the communication suite instance successfully.

OK

//Add a LwM2M object.
AT+MIPLADDOBJ=0,3311,2,"11",4,2
OK                                  //Added the object successfully. And the instance ID 0 and 1
                                      will be registered.

//Send register request to the OneNET platform.
AT+MIPLOPEN=0,600,60
OK

+MIPLEVENT: 0,1
+MIPLEVENT: 0,2
+MIPLEVENT: 0,4
+MIPLEVENT: 0,6                     //Registered successfully.
```

```
+MIPLOBSERVE: 0,78025,1,3311,0,-1          //Received observe(3311/0) request.

+MIPLOBSERVE: 0,143562,1,3311,1,-1         //Received observe(3311/1) request.

+MIPLDISCOVER: 0,12491,3311                //Received resource discover request.

//Respond to the resource discover request with resource ID list.
AT+MIPLDISCOVERRSP=0,12491,1,19,"5850;5851;5706;5805"
OK

AT+MIPLDELOBJ=0,3311                       //Delete a LwM2M object.
OK

//Send deregister request to OneNET platform.
AT+MIPLCLOSE=0
OK

+MIPLEVENT: 0,15                           //Deregistered successfully.

//Delete the communication suite instance.
AT+MIPLDELETE=0
OK                                         //Deleted the communication suite instance successfully.
```

5.3. Read Operation

5.3.1. Read Resource

Prerequisites:

1. The UE has registered to the OneNET platform successfully.
2. The Application Server has sent a read request to UE to read the resource (3311/0/5805).

```
//Received read resource request
+MIPLREAD: 0,3123,3311,0,5805

//Respond to the read request.
AT+MIPLREADRSP=0,3123,1,3311,0,5805,4,4,1.88,0,0
OK                                         //Sent data 1.88 to Application Server successfully.
```

5.3.2. Read Instance

Prerequisites:

1. The UE has registered to OneNET platform successfully.
2. The Application Server has sent a read request to UE to read the instance (3311/0).

```
//Received read instance request
+MIPLREAD: 0,25466,3311,0,-1

//Respond to the read request with four messages.
AT+MIPLREADRSP=0,25466,1,3311,0,5851,5,1,1,3,0
OK
AT+MIPLREADRSP=0,25466,1,3311,0,5852,3,2,123,2,0
OK
AT+MIPLREADRSP=0,25466,1,3311,0,5706,1,10,"1234567890",1,0
OK
AT+MIPLREADRSP=0,25466,1,3311,0,5805,4,4,1.88,0,0
OK
```

5.3.3. Read Object

Prerequisites:

1. The UE has registered to OneNET platform successfully.
2. The Application Server has sent a read request to UE to read the object (3311).

```
//Received read object request
+MIPLREAD: 0,39299,3311,-1,-1

//Respond to the read request with six messages.
AT+MIPLREADRSP=0,39299,1,3311,0,5851,5,1,1,5,0
OK
AT+MIPLREADRSP=0,39299,1,3311,0,5852,3,2,123,4,0
OK
AT+MIPLREADRSP=0,39299,1,3311,1,5851,5,1,1,3,0
OK
AT+MIPLREADRSP=0,39299,1,3311,1,5852,3,2,123,2,0
OK
AT+MIPLREADRSP=0,39299,1,3311,1,5706,1,10,"1234567890",1,0
OK
AT+MIPLREADRSP=0,39299,1,3311,1,5805,4,4,1.88,0,0
OK
```

5.4. Write Operation

5.4.1. Write Resource

Prerequisites:

1. The UE has registered to OneNET platform successfully.
2. The Application Server has sent a write request to UE to write the resource (3311/0/5706) with value in string (hello).

```
//Received write resource request.
+MIPLWRITE: 0,38017,3311,0,5706,2,5,68656C6C6F,0,0

//Respond to the write request with result code (2).
AT+MIPLWRITERSP=0,38017,2
OK
```

5.4.2. Write Instance

Prerequisites:

1. The UE has registered to OneNET platform successfully.
2. The Application Server has sent a write request to UE to write the instance (3311/0).

```
//Received write instance request.
+MIPLWRITE: 0,46584,3311,0,5706,2,5,68656C6C6F,0,2

+MIPLWRITE: 0,46584,3311,0,5850,2,1,01,0,1

+MIPLWRITE: 0,46584,3311,0,5851,2,8,00000002DFDC1C3E,0,0

//Respond to the write request with result code (2).
AT+MIPLWRITERSP=0,46584,2
OK
```

5.5. Execute Operation

Prerequisites:

1. The UE has registered to OneNET platform successfully.
2. The Application Server has sent an execute request to UE with argument “reset”.

```
//Received execute request.
+MIPLEXECUTE: 0,36476,3303,0,5605,5,"reset"
```

```
//Respond to the execute request with result code (2).
AT+MIPLEXECUTERSP=0,36476,2
OK
```

5.6. Write-Attributes Operation

Prerequisites:

1. The UE has registered to OneNET platform successfully.
2. The Application Server has sent a Write-Attributes request to UE.

```
//Received Write-Attributes request.
+MIPLPARAMETER: 0,56642,3303,0,5700,38,"pmin=2;pmax=190;gt=100.0;lt=1.0;st=0.2"

//Respond to the execute request with result code (2).
AT+MIPLPARAMETERRSP=0,56642,2
OK
```

5.7. Observe Operation

Prerequisites:

1. The UE has registered to OneNET platform successfully.
2. The Application Server has sent an observe request to UE.
3. Disable the module from automatically respond to observe requests.

```
//Received observe request.
+MIPLOBSERVE: 0,29620,1,3311,0,-1

//Confirm observe request.
AT+MIPLOBSERVERSP=0,29620,1
OK
```

5.8. Notify Operation

5.8.1. Notify Resource Data

Prerequisites:

1. The UE has registered to OneNET platform successfully.

2. The Application Server has observed the resource (3303/0/5700) successfully and **<msgId>** of the observe request is 122179.

```
//Notify resource data.
AT+MIPLNOTIFY=0,122179,3303,0,5700,4,4,25.6,0,0
OK
```

5.8.2. Notify Instance Data

Prerequisites:

1. The UE has registered to OneNET platform successfully.
2. The Application Server has observed the instance (3303/0) successfully and **<msgId>** of the observe request is 653687.

```
//Notify instance data.
AT+MIPLNOTIFY=0,653687,3303,0,5700,4,4,10.24,3,0
OK
AT+MIPLNOTIFY=0,653687,3303,0,5701,1,3,"Cel",2,0
OK
AT+MIPLNOTIFY=0,653687,3303,0,5601,4,4,0.16,1,0
OK
AT+MIPLNOTIFY=0,653687,3303,0,5602,4,4,100.86,0,0
OK
```

5.8.3. Notify Object Data

Prerequisites:

1. The UE has registered to OneNET platform successfully.
2. The Application Server has observed the object (3303) successfully and **<msgId>** of the observe request is 196301.

```
//Notify instance (0) data.
AT+MIPLNOTIFY=0,196301,3303,0,5700,4,4,9.8,3,0
OK
AT+MIPLNOTIFY=0,196301,3303,0,5701,1,3,"Cel",2,0
OK
AT+MIPLNOTIFY=0,196301,3303,0,5601,4,4,0.16,1,0
OK
AT+MIPLNOTIFY=0,196301,3303,0,5602,4,4,99.8,0,0
OK

//Notify instance (1) data.
AT+MIPLNOTIFY=0,196301,3303,1,5700,4,4,0.2,3,0
```

```
OK
AT+MIPLNOTIFY=0,196301,3303,1,5701,1,3,"Cel",2,0
OK
AT+MIPLNOTIFY=0,196301,3303,1,5601,4,4,3.2,1,0
OK
AT+MIPLNOTIFY=0,196301,3303,1,5602,4,4,100.1,0,0
OK
```

5.8.4. Notify Resource Data with <ackid>

Prerequisites:

1. The UE has registered to OneNET platform successfully.
2. The Application Server has observed the resource (3303/0/5701) successfully and **<msgId>** of the observe request is 307353.

```
//Notify resource data with <ackid> (255).
AT+MIPLNOTIFY=0,307353,3303,0,5701,1,3,"Cel",0,0,255
OK

+MIPLEVENT: 0,26,255                    //Return notification results.
```

5.8.5. Notify Resource Data with <ackid> and RAI Flag

Prerequisites:

1. The UE has registered to OneNET platform successfully.
2. The Application Server has observed the resource (3303/0/5701) successfully and **<msgId>** of the observe request is 307353.
3. Execute the **AT+CSCON=1** command to enable "+CSCON" URC reporting function, which can be used to indicate whether the RAI identifier takes effect.

```
//Notify resource data with <ackid> (256) and RAI flag (0x400).
[15:04:15:919]AT+MIPLNOTIFY=0,307353,3303,0,5701,1,3,"Cel",0,0,256,0x400
[15:04:15:983]OK
[15:04:16:736]
[15:04:16:736]+CSCON:1                  //Set up a RRC connection and start sending the
                                          message.
[15:04:17:118]
[15:04:17:118]+MIPLEVENT: 0,26,256      //Return notification results.
[15:04:17:437]
[15:04:17:437]+CSCON:0                  //After ACK is received, the RRC connection will
                                          be immediately released.
```

NOTE

"+MIPLEVENT:" URC and "+CSCON:" URC may be outputted in any order.

5.8.6. Notify Instance Data with <ackid>

Prerequisites:

1. The UE has registered to OneNET platform successfully.
2. The Application Server has observed the resource (3303/0) successfully and **<msgId>** of the observe request is 487674.

```
//Notify resource data with <ackid> (258).
AT+MIPLNOTIFY=0,487674,3303,0,5700,4,4,170.1,3,0,258
OK
AT+MIPLNOTIFY=0,487674,3303,0,5701,1,3,"Cel",2,0,258
OK
AT+MIPLNOTIFY=0,487674,3303,0,5601,4,4,106.1,1,0,258
OK
AT+MIPLNOTIFY=0,487674,3303,0,5602,4,4,660.9,0,0,258
OK

+MIPLEVENT: 0,26,258                    //Return notification results
```

5.8.7. Notify Instance Data with <ackid> and RAI Flag

Prerequisites:

1. The UE has registered to OneNET platform successfully.
2. The Application Server has observed the resource (3303/0) successfully and **<msgId>** of the observe request is 450380.
3. Execute the **AT+CSCON=1** command to enable "+CSCON" URC reporting function, which can be used to indicate whether the RAI identifier takes effect.

```
//Notify resource data with <ackid> (257). and RAI flag(0x400).
[15:37:14:339]AT+MIPLNOTIFY=0,450380,3303,0,5700,4,4,170.1,3,0,257,0x400
[15:37:14:403]OK
[15:37:14:643]AT+MIPLNOTIFY=0,450380,3303,0,5701,1,3,"Cel",2,0,257,0x400
[15:37:14:692]OK
[15:37:14:931]AT+MIPLNOTIFY=0,450380,3303,0,5601,4,4,106.1,1,0,257,0x400
[15:37:14:995]OK
[15:37:15:235]AT+MIPLNOTIFY=0,450380,3303,0,5602,4,4,660.9,0,0,257,0x400
[15:37:15:299]OK
[15:37:16:281]
```

```
[15:37:16:281]+CSCON:1                          //Set up a RRC connection and start sending
                                                  the message.
[15:37:16:828]
[15:37:16:828]+MIPLEVENT: 0,26,257              //Return notification results.
[15:37:17:477]
[15:37:17:477]+CSCON:0                          //After ACK is received, the RRC connection will
                                                  be immediately released.
```

NOTE

"+MIPLEVENT" URC and "+CSCON" URC may be outputted in any order.

5.9. Update Operation

5.9.1. Update Operation without RAI Flag

Prerequisite:

The UE has registered to OneNET platform successfully.

```
//Update lifetime to 86400 seconds.
AT+MIPLUPDATE=0,86400,0
OK

+MIPLEVENT: 0,11                                //Return update result.
```

5.9.2. Update Operation with RAI Flag

Prerequisites:

1. The UE has registered to OneNET platform successfully.
2. Execute the **AT+CSCON=1** command to enable "+CSCON" URC reporting function, which can be used to indicate whether the RAI identifier takes effect.

```
[14:43:14:359]AT+MIPLUPDATE=0,86400,0,0x400     //Update lifetime to 86400 seconds.
[14:43:14:391]OK
[14:43:14:832]
[14:43:14:832]+CSCON:1                          //Set up a RRC connection and start sending
                                                  update request.
[14:43:15:182]
[14:43:15:182]+MIPLEVENT: 0,11                  //Return update result.

[14:43:15:389]
```

[14:43:15:389]**+CSCON:0**	//After ACK is received, the RRC connection will be immediately released.

6 Summary of Error Codes

This chapter introduces the error codes related to BC35-G, BC28 and BC95 R2.0 modules.

The error codes listed in the following two tables are compliant with 3GPP specifications. Please refer to *3GPP TS 27.007 V13.5.0, sub-clause 9.2* for all possible **<err>** codes.

Table 3: General Errors (27.007)

Code of <err>	Description
3	Operation not allowed
4	Operation not supported
23	Memory failure
30	No network service
50	Incorrect parameters
51	Command implemented but currently disabled
52	Command aborted by user
159	Uplink busy/flow control

Table 4: General Errors (27.005)

Code of <err>	Description
300	ME failure
301	SMS service of ME reserved
302	Operation not allowed
303	Operation not supported
304	Invalid PDU mode parameter

305	Invalid text mode parameter
310	USIM not inserted
311	USIM PIN required
312	PH-USIM PIN required
313	USIM failure
314	USIM busy
315	USIM wrong
316	USIM PUK required
317	USIM PIN2 required
318	USIM PUK2 required
320	Memory failure
321	Invalid memory index
322	Memory full
330	SMSC address unknown
331	No network service
332	Network timeout
340	No +CNMA acknowledgement expected
500	Unknown error

NOTE

AT+CMEE=<n> command disables (**<n>**=0) or enables (**<n>**=1) the use of final result code "**+CME ERROR:<err>**". When **<n>**=1, a limited set of error codes will be returned.

7 Appendix A References

Table 5: Related Documents

SN	Document Name	Remark
[1]	IPSO-Smart-Objects-Starter-Pack	Internet Protocol for Smart Objects (IPSO) Alliance
[2]	OMA-TS-LightweightM2M-V1_0	Open Mobile Alliance LwM2M Specification

Table 6: Terms and Abbreviations

Abbreviation	Description
CoAP	Constrained Application Protocol
LwM2M	Lightweight Machine to Machine
ME	Mobile Equipment
NB-IoT	Narrow Band Internet of Things
REST	Representational state transfer
TE	Terminal Equipment (Typically the MCU)
UE	User Equipment (Typically the Module)
URC	Unsolicited Result Code