A76XX Series_ APN_Application Note

LTE Module

SIMCom Wireless Solutions Limited
SIMCom Headquarters Building, Building 3, No. 289 Linhong Road, Changning District, Shanghai P.R. China
Tel: 86-21-31575100
support@simcom.com
www.simcom.com

Document Title:	A76XX Series_APN_Application Note
Version:	1.02
Date:	2022.12.20
Status:	Released

GENERAL NOTES

SIMCOM OFFERS THIS INFORMATION AS A SERVICE TO ITS CUSTOMERS, TO SUPPORT APPLICATION AND ENGINEERING EFFORTS THAT USE THE PRODUCTS DESIGNED BY SIMCOM. THE INFORMATION PROVIDED IS BASED UPON REQUIREMENTS SPECIFICALLY PROVIDED TO SIMCOM BY THE CUSTOMERS. SIMCOM HAS NOT UNDERTAKEN ANY INDEPENDENT SEARCH FOR ADDITIONAL RELEVANT INFORMATION, INCLUDING ANY INFORMATION THAT MAY BE IN THE CUSTOMER'S POSSESSION. FURTHERMORE, SYSTEM VALIDATION OF THIS PRODUCT DESIGNED BY SIMCOM WITHIN A LARGER ELECTRONIC SYSTEM REMAINS THE RESPONSIBILITY OF THE CUSTOMER OR THE CUSTOMER'S SYSTEM INTEGRATOR. ALL SPECIFICATIONS SUPPLIED HEREIN ARE SUBJECT TO CHANGE.

COPYRIGHT

SIMCom Wireless Solutions Limited
SIMCom Headquarters Building, Building 3, No. 289 Linhong Road, Changning District, Shanghai P.R. China
Tel: +86 21 31575100
Email: simcom@simcom.com

For more information, please visit:
https://www.simcom.com/download/list-863-en.html

For technical support, or to report documentation errors, please visit:
https://www.simcom.com/ask/ or email to: support@simcom.com

About Document

Version History

Version	Date	Owner	What is new
V1.00	2022.2.28	Liyue.liu	New version
V1.01	2022.8.4	Liyue.liu	Added Chapter 4.3
V1.02	2022.8.30	Liyue.liu	Added Chapter 4.3

Scope

Based on module AT command manual, this document will introduce APN application process. Developers could understand and develop application quickly and efficiently based on this document. This document applies to A1603 Series.

Contents

1 Introduction

1.1 Purpose of the document

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

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

1.2 Related documents

[1] A76XXSeries_AT Command Manual

1.3 Conventions and abbreviations

APN	Access Point Name
API	Application Programming Interface
PDP	Packet Data Protocol
PDP-IP	Packet Data Protocol – internet protocol

2 AT Commands for APN

2.1 AT+CGDCONT Define PDP context

The set command specifies PDP context parameter values for a PDP context identified by the (local)context identification parameter <cid>. The number of PDP contexts that may be in a defined state at the same time is given by the range returned by the test command. A special form of the write command (AT+CGDCONT=<cid>)causes the values for context <cid> to become undefined.

AT+CGDCONT Define PDP context	
Test Command **AT+CGDCONT=?**	Response 1) **+CGDCONT: (**range of supported**<cid>s),<PDP_type>,,,(**list of supported **<d_comp>s),(**list of supported **<h_comp>**s**),(**list of **<ipv4_ctrl>s),(**list of **<request_type>s)** **OK** 2) **ERROR**
Read Command **AT+CGDCONT?**	Response 1) **+CGDCONT: <cid>,<PDP_type>,<APN>[[,<PDP_addr>],<d_comp>,<h_comp>, <ipv4_ctrl>,<request_type>,<P-CSCF_discovery>,<IM_CN_Signalling_Flag_Ind>]<CR><LF>** **+CGDCONT: <cid>,<PDP_type>,<APN>[[,<PDP_addr>],<d_comp>,<h_comp>, <ipv4_ctrl>,<request_type>,<P-CSCF_discovery>,<IM_CN_Signalling_Flag_Ind>]** **OK** 2) **ERROR**
Write Command **AT+CGDCONT=<cid>[,<PDP_type>[,<APN>[,<PDP_addr>[,<d_comp>[,<h_comp>][,<ipv4_ctrl>[,<request_type>]]]]]]**	Response 1) **OK** 2) **ERROR**

Execution Command AT+CGDCONT	Response 1) **OK** 2) **ERROR**
Parameter Saving Mode	AUTO_SAVE
Max Response Time	9000ms
Reference	3GPP TS 27.007

Defined Values

<cid>	(PDP Context Identifier)a numeric parameter which specifies a particular PDP context definition. The parameter is local to the TE-MT interface and is used in other PDP context-related commands. The range of permitted values (minimum value=1)is returned by the test form of the command. 1…15
<PDP_type>	(Packet Data Protocol type)a string parameter which specifies the type of packet data protocol. IP Internet Protocol IPV6 Internet Protocol Version 6 IPV4V6 Dual PDN Stack
<APN>	(Access Point Name)a string parameter which is a logical name that is used to select the GGSN or the external packet data network.
<PDP_addr>	A string parameter that identifies the MT in the address space applicable to the PDP. This parameter will be omitted when PDP_type is PPP type. Read command will continue to return the null string even if an address has been allocated during the PDP startup procedure. The allocated address may be read using command AT+CGPADDR.
<d_comp>	A numeric parameter that controls PDP data compression, this value may depend on platform: 0 off (default if value is omitted) 1 on 2 V.42bis
<h_comp>	A numeric parameter that controls PDP header compression, this value may depend on platform: 0 off (default if value is omitted) 1 RFC1144
<ipv4_ctrl>	Parameter that controls how the MT/TA requests to get the IPv4 address information: 0 Address Allocation through NAS Signaling 1 on
<request_type>	integer type; indicates the type of PDP context activation request for

	the PDP context, see 3GPP TS 24.301 [83] (subclause 6.5.1.2)and 3GPP TS 24.008 [8] (subclause 10.5.6.17). If the initial PDP context is supported (see subclause 10.1.0)it is not allowed to assign <cid>=0 for emergency bearer services. According to 3GPP TS 24.008 [8] (subclause 4.2.4.2.2 and subclause 4.2.5.1.4)and 3GPP TS 24.301 [83] (subclause 5.2.2.3.3 and subclause 5.2.3.2.2), a separate PDP context must be established for emergency bearer services. NOTE 4: If the PDP context for emergency bearer services is the only activated context, only emergency calls are allowed, see 3GPP TS 23.401 [82] subclause 4.3.12.9. 0 PDP context is for new PDP context establishment or for handover from a non-3GPP access network (how the MT decides whether the PDP context is for new PDP context establishment or for handover is implementation specific) 1 PDP context is for emergency bearer services 2 PDP context is for new PDP context establishment
<P-CSCF_discovery>	integer type; influences how the MT/TA requests to get the P-CSCF address, see 3GPP TS 24.229 [89] annex B and annex L. 0 Preference of P-CSCF address discovery not influenced by +CGDCONT 1 Preference of P-CSCF address discovery through NAS signalling 2 Preference of P-CSCF address discovery through DHCP
<IM_CN_Signalling_Flag_Ind>	integer type; indicates to the network whether the PDP context is for IM CN subsystem-related signalling only or not. 0 UE indicates that the PDP context is not for IM CN subsystem-related signalling only 1 UE indicates that the PDP context is for IM CN subsystem-related signalling only

Examples

```
AT+CGDCONT=?
+CGDCONT: (1-15),"IP",,,(0-2),(0-1),(0-1),(0-2)
+CGDCONT: (1-15),"IPV6",,,(0-2),(0-1),(0-1),(0-2)
+CGDCONT: (1-15),"IPV4V6",,,(0-2),(0-1),(0-1),(0-2)

OK
AT+CGDCONT?
+CGDCONT: 1,"IP",""

OK
AT+CGDCONT=1,"IP","cnnet"
OK
```

AT+CGDCONT
OK

2.2 AT+CGAUTH Set type of authentication for PDP-IP connections of GPRS

This command is used to set type of authentication for PDP-IP connections of GPRS.

AT+CGAUTH Set type of authentication for PDP-IP connections of GPRS	
Test Command AT+CGAUTH=?	Response 1) **+CGAUTH: (**range of supported **<cid>s),(**list of supported **<auth_type> s),50,50** **OK** 2) **ERROR** 3) **+CME ERROR: <err>**
Read Command AT+CGAUTH?	Response 1) **+CGAUTH: [<cid>,<auth_type>[,<user>,<passwd>]]** **…** **OK** 2) **ERROR** 3) **+CME ERROR: <err>**
Write Command AT+CGAUTH=<cid>[,<auth_type>[,<passwd>[,<user>]]]	Response 1) **OK** 2) **ERROR** 3) **+CME ERROR: <err>**
Execution Command AT+CGAUTH	Response 1) **OK** 2)

	ERROR 3) **+CME ERROR: <err>**
Parameter Saving Mode	AUTO_SAVE
Max Response Time	9000ms
Reference	3GPP TS 27.007

Defined Values

<cid>	Parameter specifies a particular PDP context definition. This is also used in other PDP context-related commands. 1…15
<auth_type>	Indicate the type of authentication to be used for the specified context. If CHAP is selected another parameter <passwd> needs to be specified. If PAP is selected two additional parameters <passwd> and <user> need to specified. 0 none 1 PAP 2 CHAP
<passwd>	Parameter specifies the password used for authentication.
<user>	Parameter specifies the user name used for authentication.

Examples

```
AT+CGAUTH=?
+CGAUTH: (1-15),(0-2),50,50

OK
AT+CGAUTH?
+CGAUTH: 1,0

OK
AT+CGAUTH=1,0
OK
AT+CGAUTH
OK
```

2.3 AT+CNETCON The AT command used to set the APN when multiple dialing is required

AT+CNETCON The AT command used to set the APN when multiple dialing is required	
Read Command **AT+CNETCON?**	Response 1) **+Cnetcon: [<cid>,<ip_type>,<APN>]** **+Cnetcon: [<cid>,<auth_type>,<user,password>]** **…** **OK** 2) **ERROR** 3) **+CME ERROR: <err>**
Write Command **AT+CNETCON =<cid>,<ip_type>,<APN>**	Response 1) **OK** 2) **ERROR** 3) **+CME ERROR: <err>**
Parameter Saving Mode	AUTO_SAVE
Max Response Time	9000ms
Reference	3GPP TS 27.007

Defined Values

<cid>	(PDP Context Identifier)a numeric parameter which specifies a particular PDP context definition. The parameter is local to the TE-MT interface and is used in other PDP context-related commands. The range of permitted values (minimum value=1)is returned by the test form of the command. 0-5
<PDP_type>	(Packet Data Protocol type)a string parameter which specifies the type of packet data protocol. IP Internet Protocol IPV6 Internet Protocol Version 6 IPV4V6 Dual PDN Stack
<APN>	(Access Point Name)a string parameter which is a logical name that is

	used to select the GGSN or the external packet data network.

Examples

```
at+cnetcon?
+CNETCON: 0,"IP","3gnet"
+CNETCON: 0,AUTH: 0,USERPWD: ","
+CNETCON: 1,"IP","3gnet2"
+CNETCON: 1,AUTH: 0,USERPWD: ","
+CNETCON: 2,"","" 
+CNETCON: 2,AUTH: 1,USERPWD: ","
+CNETCON: 3,"","" 
+CNETCON: 3,AUTH: 1,USERPWD: ","
+CNETCON: 4,"","" 
+CNETCON: 4,AUTH: 1,USERPWD: ","
+CNETCON: 5,"","" 
+CNETCON: 5,AUTH: 1,USERPWD: ","

OK
at+cnetcon=0,"IP","3gnet"
OK
```

3 API for APN

3.1 sAPI_NetworkSetCgdcont

This application interface is used to set PDP context parameter values for a PDP context.

sAPI_NetworkSetCgdcont	
Prototype	unsigned int **sAPI_NetworkSetCgdcont**(int primCid, char *type, char *APNstr);
Parameters	[int] **primCid**: 1-15 a numeric parameter which specifies a particular PDP context definition. The parameter is local to the TE-MT interface and is used in other PDP context-related

	commands. The range of permitted values(minimum value = 1); is returned by the test form of the command. [int] **type:** a string parameter which specifies the type of packet data protocol. IP Internet Protocol PPP Point to Point Protocol IPV6 Internet Protocol Version 6 [int] **APNstr:** a string parameter which is a logical name that is used to select the GGSN or the external packet data network
Return value	SC_NET_SUCCESS:set PDP context parameter values for a PDP context success. SC_NET_FAIL:set PDP context parameter values for a PDP context fail.
Header	#include "simcom_network.h"

Examples

```
#include "simcom_network.h"

unsigned int NetWork_Test(void);
{
    int ret = CIRC_FAIL;

    ret = sAPI_NetworkSetCgdcont(2, "IP", "cmnet");
    return ret;
}
```

3.2 sAPI_NetworkSetCGAUTH

Set type of authentication for PDP-IP connections of GPRS.

sAPI_NetworkSetCGAUTH	
Prototype	unsigned int sAPI_NetworkSetCGAUTH(SCCGAUTHParm *pCgauth,BOOL delflag)
Parameters	[out] **pStr**: pCgauth: Cgauth parm delflag: 1:delete 0:set
Return value	SC_NET_SUCCESS: get adjacent base station information success. SC_NET_FAIL: get adjacent base station information fail.
Header	#include "simcom_network.h"

Examples

```
#include "simcom_network.h"

unsigned int NetWork_Test(void);
{
    auth.cid = 1;
    auth.authtype = 2;
    sprintf(auth.user, "simcom");
    sprintf(auth.passwd, "simcom");
    ret = sAPI_NetworkSetCGAUTH(&auth,0);
}
```

4 APN Examples

4.1 Set APN with the AT Commands

4.1.1 Don't use a username or password

Simcard do not require a user name or password

```
AT+CGDCONT=1,"IP","cnnet"
OK
```

4.1.2 Use a username or password

You need to ask the operator to confirm the user name ， password and APN of the card.
If you use the AT Commands way:

```
AT+CGAUTH=1,1,”simcom”,”simcom”
OK
AT+CGDCONT=1,"IP","cnnet"
OK
```

4.2 Set APN with the API

4.2.1 Don't use a username or password

```
#include "simcom_network.h"

unsigned int NetWork_Test(void);
{
    int ret = CIRC_FAIL;

    ret = sAPI_NetworkSetCgdcont(1, "IP", "cmnet");
    return ret;
}
```

4.2.2 Use a username or password

```
#include "simcom_network.h"

unsigned int NetWork_Test(void);
{
    int ret = CIRC_FAIL;
    auth.cid = 1;
    auth.authtype = 1;
    sprintf(auth.user, "simcom");
    sprintf(auth.passwd, "simcom");
    ret = sAPI_NetworkSetCGAUTH(&auth,0);
    ret = sAPI_NetworkSetCgdcont(1, "IP", "cmnet");
    return ret;
}
```

4.3 Set the APN when multiple dialing

Set the APN for dialing using the CnetCON . CFTPSSTART Dial the first route, Netopen =2 dial the second route.

```
at+cnetcon=0,"IP","3gnet"
OK
at+cnetcon=1,"IP","3gnet1"
OK
at+cnetcon?
+CNETCON: 0,"IP","3gnet"
+CNETCON: 0,AUTH: 0,USERPWD: ","
+CNETCON: 1,"IP","3gnet1"
+CNETCON: 1,AUTH: 0,USERPWD: ","
+CNETCON: 2,"",""
+CNETCON: 2,AUTH: 1,USERPWD: ","
+CNETCON: 3,"",""
+CNETCON: 3,AUTH: 1,USERPWD: ","
+CNETCON: 4,"",""
+CNETCON: 4,AUTH: 1,USERPWD: ","
+CNETCON: 5,"",""
+CNETCON: 5,AUTH: 1,USERPWD: ","

OK
at+CFTPSSTART
```

```
OK

+CFTPSSTART: 0
at+netopen=2
OK

+NETOPEN: 0
```

Use the API to Set the APN for dialing using the CnetCON.

```
{
        int i;
        sprintf(apnparm.ip_type,"IP");
        sprintf(apnparm.apn,"3gnet0");
        sAPI_NetworkSetCnetcon(0,&apnparm);
        memset(&apnparm,0,sizeof(SCdialapnparm));

        sprintf(apnparm.ip_type,"IP");
        sprintf(apnparm.apn,"3gnet1");
        sAPI_NetworkSetCnetcon(1,&apnparm);

        memset(dialapnparm,0,sizeof(SCdialapnparm));
        sAPI_NetworkGetCnetcon(dialapnparm);
        for(i = 0;i < 6;i++)
        {
                sAPI_Debug("%s,%d,%s,%s,%s,%s,%d",__func__,i,dialapnparm[i].apn,dialapnparm[i].u
                        ser,dialapnparm[i].pswd,dialapnparm[i].ip_type,dialapnparm[i].auth);
        }
        sAPI_TcpipPdpActive(1, 1);
        sAPI_TaskSleep(400);
        sAPI_TcpipPdpActive(2, 1);
}
```

NOTE

If you set the wrong APN,otherwise data service cannot be used or Attach is rejected.If you do not know the APN, username and password. You can choose not to set it, the network side will automatically assign a default APN during attach. If this card has a dedicated APN, please ask the operator.