Ubuntu10.10（Linux 2.6.32-33-generic）环境下加载 T5300 方法
使用中国移动卡 APN：CMNET

在 Linux 环境下，只要确定 OS 有 usbserial.ko 这个驱动文件，即可加载 USB 设备。加载方法可以分为几个步骤：

由于 Ubuntu10.10（与 Ubuntu10.04 和 Ubuntu11.04 相同）不能在/proc/bus 里映射出 usb，故不能用 mount 来挂载 USB 文件系统 usbfs。故加载 T5300 的 USB 方法有别于常规方法。

打开 T5300 的电源，USB 连接到 OS。

1. 查看系统是否已经载入 USB 转串口驱动 usbserial.ko：

```
root@ubuntu:~# sudo lsmod | grep usbserial
usbserial              33100  2 option,usb_wwan  //说明系统已经载入USB转串口驱动
```

注：如若没有看到 usbserial，安装一个：

```
root@ubuntu:/# sudo apt-get install setserial
```

2. 打开显示 USB 系统信息

```
root@ubuntu:~# sudo dmesg | grep ttyAMC0
```

如果 USB 加载成功，返回如下消息：

```
[   12.148849] cdc_acm 2-1.2:8.3: ttyACM0: USB ACM device
```

3. 查看系统所挂设备端口

```
root@ubuntu:/# cd /dev

root@ubuntu:/dev# ls
```

返回所有的系统设备端口，不同系统由于所挂设备不同，返回不同：

```
audio           loop6           ram7        tty10  tty39  ttyACM0
block           loop7           ram8        tty11  tty4   ttyACM1
bsg             mapper          ram9        tty12  tty40  ttyS0
bus             mcelog          random      tty13  tty41  ttyS1
```

```
cdrom              mem                network_throughput  sda      tty19  tty47  usbmon2
disk               null               sda1                tty2     tty48  v4l
dri                oldmem             sda2                tty20    tty49  vcs
dsp                pktcdvd            sda5                tty21    tty5   vcs1
dvd                port               sda6                tty22    tty50  vcs2
dvdrw              ppp                sda7                tty23    tty51  vcs3
ecryptfs           psaux              sequencer           tty24    tty52  vcs4
fb0                ptmx               sequencer2          tty25    tty53  vcs5
fd                 pts                serial              tty26    tty54  vcs6
full               ram0               sg0                 tty27    tty55  vcs7
fuse               ram1               sg1                 tty28    tty56  vcsa
hidraw0            ram10              shm                 tty29    tty57  vcsa1
hpet               ram11              snapshot            tty3     tty58  vcsa2
input              ram12              snd                 tty30    tty59  vcsa3
kmsg               ram13              sndstat             tty31    tty6   vcsa4
log                ram14              sr0                 tty32    tty60  vcsa5
loop0              ram15              stderr              tty33    tty61  vcsa6
```

```
loop1           ram2            stdin       tty34   tty62   vcsa7
loop2           ram3            stdout      tty35   tty63   vga_arbiter
loop3           ram4            tty         tty36   tty7    video0
loop4           ram5            tty0        tty37   tty8    zero
loop5           ram6            tty1        tty38   tty9
```

注：注意以上设备中会有 ttyACM0、ttyACM1 两个端口，若验证是否是 T5300 模块端口，可以给模块断电看此 3 个端口是否消失判断。

4. 也可以只查看 ttyACM 端口

```
root@ubuntu:/dev# ls ttyACM*
```

若 T5300 驱动成功加载，会有如下返回：

```
ttyACM0  ttyACM1
```

5. 使用 minicom 调试 T5300 的 AT 口（ttyACM0）

5.1. 设置 minicom

```
root@ubuntu:~# minicom -s
```

5.1.1. 选择“Serial port setup”：

```
+-----[configuration]------+
| Filenames and paths      |
| File transfer protocols  |
| Serial port setup        |
| Modem and dialing        |
| Screen and keyboard      |
| Save setup as dfl        |
| Save setup as..          |
| Exit                     |
| Exit from Minicom        |
+--------------------------+
```

5.1.2. 修改“Serial Device”为“/dev/ttyACM0”，修改“Hardware Flow Control”为“NO”：

```
+-----------------------------------------------------------------------+
| A -    Serial Device      : /dev/ttyACM0                              |
| B - Lockfile Location     : /var/lock                                 |
| C -   Callin Program      :                                           |
| D -  Callout Program      :                                           |
| E -    Bps/Par/Bits       : 115200 8N1                                |
| F - Hardware Flow Control : No                                        |
| G - Software Flow Control : No                                        |
|                                                                       |
|    Change which setting?                                              |
+-----------------------------------------------------------------------+
```

5.1.3. 选择“Save setup as dfl”之后选择“Exit”：

```
+-----[configuration]------+
| Filenames and paths      |
| File transfer protocols  |
| Serial port setup        |
| Modem and dialing        |
| Screen and keyboard      |
| Save setup as dfl        |
| Save setup as..          |
| Exit                     |
| Exit from Minicom        |
+--------------------------+
```

5.2. 使用 minicom 调试模块 AT 口

如果端口能够打开将会有如下返回：

```
Welcome to minicom 2.4


OPTIONS: I18n

Compiled on Jan 25 2010, 06:49:09.

Port /dev/ttyACM0
```

```
Press CTRL-A Z for help on special keys

AT S7=45 S0=0 L1 V1 X4 &c1 E1 Q0
OK

AT+CSQ

+CSQ: 24,99



OK

AT+COPS?

+COPS: 0,0,"CHINA MOBILE",3



OK

AT+LSVER
LDA0009.6717DV2.1.1.T06W0721_ME23A

LDA0009.6717DV2.1.1.T06W0721_ME23A



OK
AT+CREG?

+CREG: 0,1



OK

ATD13601896411;

^ORIG:1,0
```

^CONF:1

5.3. 关闭 minicom，使用 CTRL+A 键：

```
CTRL-A Z for help |115200 8N1 | NOR | Minicom 2.3-rc | VT102 |      Offline
```

按 Z 键即可得到：

```
+-----------------------------------------------------------------------+
|                     Minicom Command Summary                           |
|                                                                       |
|          Commands can be called by CTRL-A <key>                       |
|                                                                       |
|               Main Functions                  Other Functions         |
|                                                                       |
| Dialing directory..D  run script (Go)....G | Clear Screen.......C |
| Send files.........S  Receive files......R | cOnfigure Minicom..O |
| comm Parameters....P  Add linefeed.......A | Suspend minicom....J |
| Capture on/off.....L  Hangup.............H | eXit and reset.....X |
| send break.........F  initialize Modem...M | Quit with no reset.Q |
| Terminal settings..T  run Kermit.........K | Cursor key mode....I |
| lineWrap on/off....W  local Echo on/off..E | Help screen........Z |
| Paste file.........Y                       | scroll Back........B |
|                                                                       |
|      Select function or press Enter for none.                         |
|                                                                       |
|              Written by Miquel van Smoorenburg 1991-1995              |
|              Some additions by Jukka Lahtinen 1997-2000               |
|              i18n by Arnaldo Carvalho de Melo 1998                    |
+-----------------------------------------------------------------------+
```

按 X 键即可退出 minicom：

```
+----------------------+
|    Leave Minicom?    |
|     Yes       No     |
+----------------------+
```

6. 创建 PPP 拨号脚本和 modem 配置

6.1. 在/etc/ppp 目录下创建一个 chat 文件夹，用来存放拨号脚本文件：

root@ubuntu:~# sudo mkdir /etc/ppp/chat

6.2. 在/etc/ppp/chat 文件夹创建一个 td-connect-chat 空文件：

```
root@ubuntu:~# sudo touch /etc/ppp/chat/td-connect-chat
```

6.3. 编辑 td-connect-chat 文件：

```
root@ubuntu:~# sudo chmod 777 /etc/ppp/chat/td-connect-chat
root@ubuntu:~# sudo gedit /etc/ppp/chat/td-connect-chat
```

将如下内容写入并保存：

```
TIMEOUT 15
ABORT 'BUSY'
ABORT 'NO CARRIER'
ABORT 'ERROR'
''
AT+CGDCONT=1,"IP","CMNET"
OK
AT+CGEQREQ=1,2,2048,2048,64,64,0,0,"0E0","0E0",,0,0
OK
ATDT*98*1#
TIMEOUT 30
CONNECT
```

6.4. 在/etc/ppp/peers 文件夹创建一个 td 空文件：

```
root@ubuntu:~# sudo touch /etc/ppp/peers/td
```

6.5. 编辑 td 文件：

```
root@ubuntu:~# sudo chmod 777 /etc/ppp/peers/td
root@ubuntu:~# sudo gedit /etc/ppp/peers/td
```

将如下内容写入并保存：

```
# Usage: root>pppd call td
ttyACM0
115200
nocrtscts
connect '/usr/sbin/chat -s -v -f /etc/ppp/chat/td-connect-chat'
debug
usepeerdns
noauth
nodetach
noipdefault
-chap
```

```
user ascend
password ascend
ipcp-accept-local
ipcp-accept-remote
modem
defaultroute
```

7. PPP 拨号（确保插入正确的 SIM/USIM 卡，连上天线，打开模块电源）

```
root@ubuntu:/dev# pppd call td
```

终端会返回：

```
timeout set to 15 seconds

abort on (BUSY)

abort on (NO CARRIER)

abort on (ERROR)

send (AT+CGDCONT=1,"IP","CMNET"^M)

expect (OK)

^M

OK

 -- got it



send (AT+CGEQREQ=1,2,2048,2048,64,64,0,0,"0E0","0E0",,0,0^M)

expect (OK)

^M

AT+CGDCONT=1,"IP","CMNET"^M^M

OK

 -- got it
```

```
send (ATDT*98*1#^M)

timeout set to 30 seconds

expect (CONNECT)

^M

AT+CGEQREQ=1,2,2048,2048,64,64,0,0,"0E0","0E0",,0,0^MATDT*98*1#^M^M

CONNECT

 -- got it


Script /usr/sbin/chat -s -v -f /etc/ppp/chat/td-connect-chat finished (pid 1840),
status = 0x0

Serial connection established.

using channel 1

Using interface ppp0

Connect: ppp0 <--> /dev/ttyACM0

sent [LCP ConfReq id=0x1 <asyncmap 0x0> <magic 0xd053f4c3> <pcomp> <accomp>]

rcvd [LCP ConfReq id=0x1 <asyncmap 0xa0000> <auth pap>]

sent [LCP ConfAck id=0x1 <asyncmap 0xa0000> <auth pap>]

rcvd [LCP ConfRej id=0x1 <magic 0xd053f4c3> <pcomp> <accomp>]

sent [LCP ConfReq id=0x2 <asyncmap 0x0>]

rcvd [LCP ConfAck id=0x2 <asyncmap 0x0>]

sent [LCP EchoReq id=0x0 magic=0x0]
```

sent [PAP AuthReq id=0x1 user="ascend" password=<hidden>]

rcvd [LCP EchoRep id=0x0 magic=0x0]

rcvd [PAP AuthAck id=0x1 "Login OK"]

Remote message: Login OK

PAP authentication succeeded

sent [CCP ConfReq id=0x1 <deflate 15> <deflate(old#) 15> <bsd v1 15>]

sent [IPCP ConfReq id=0x1 <compress VJ 0f 01> <addr 0.0.0.0> <ms-dns1 0.0.0.0> <ms-dns2 0.0.0.0>]

rcvd [LCP ProtRej id=0x2 80 fd 01 01 00 0f 1a 04 78 00 18 04 78 00 15 03 2f]

Protocol-Reject for 'Compression Control Protocol' (0x80fd) received

sent [IPCP ConfReq id=0x1 <compress VJ 0f 01> <addr 0.0.0.0> <ms-dns1 0.0.0.0> <ms-dns2 0.0.0.0>]

rcvd [IPCP ConfReq id=0x1 <addr 192.200.1.21>]

sent [IPCP ConfAck id=0x1 <addr 192.200.1.21>]

rcvd [IPCP ConfRej id=0x1 <compress VJ 0f 01>]

sent [IPCP ConfReq id=0x2 <addr 0.0.0.0> <ms-dns1 0.0.0.0> <ms-dns2 0.0.0.0>]

rcvd [IPCP ConfNak id=0x2 <addr 10.68.191.231> <ms-dns1 211.136.112.50> <ms-dns2 211.136.150.66>]

sent [IPCP ConfReq id=0x3 <addr 10.68.191.231> <ms-dns1 211.136.112.50> <ms-dns2 211.136.150.66>]

rcvd [IPCP ConfAck id=0x3 <addr 10.68.191.231> <ms-dns1 211.136.112.50> <ms-dns2 211.136.150.66>]

Cannot determine ethernet address for proxy ARP

local IP address 10.68.191.231

```
remote IP address 192.200.1.21

primary   DNS address 211.136.112.50

secondary DNS address 211.136.150.66

Script /etc/ppp/ip-up started (pid 1852)

Script /etc/ppp/ip-up finished (pid 1852), status = 0x0
```

以上信息表明 PPP 连接已经成功。

8. 验证网络连接，ping 一个存在的 ip：

```
akim@akim-desktop1:~$ ping 119.75.217.56
```

联网正常，会有如下返回：

```
root@ubuntu:~# ping www.baidu.com

PING www.a.shifen.com (119.75.217.56) 56(84) bytes of data.

64 bytes from 119.75.217.56: icmp_seq=1 ttl=50 time=195 ms

64 bytes from 119.75.217.56: icmp_seq=2 ttl=50 time=714 ms

64 bytes from 119.75.217.56: icmp_seq=3 ttl=50 time=814 ms

64 bytes from 119.75.217.56: icmp_seq=4 ttl=50 time=675 ms

64 bytes from 119.75.217.56: icmp_seq=5 ttl=50 time=674 ms
```

若要停止 ping 按 CTRL+C：

```
--- www.a.shifen.com ping statistics ---

5 packets transmitted, 5 received, 0% packet loss, time 23245ms

rtt min/avg/max/mdev = 195.848/615.021/814.762/215.716 ms
```

9. 断开 PPP 连接

```
akim@akim-desktop1:~$ sudo killall pppd
```

PPP 终端口将会返回如下信息：

```
Terminating on signal 15

Connect time 6.0 minutes.

Sent 1366 bytes, received 2196 bytes.

Script /etc/ppp/ip-down started (pid 2106)

sent [LCP TermReq id=0x3 "User request"]

rcvd [LCP TermAck id=0x3]

Connection terminated.

Script /etc/ppp/ip-down finished (pid 2106), status = 0x0
```