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# **How to use Linux driver for ZTE MF821 device**

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# 1 Distributions Supported

The driver can support these distributions:

Distribution	Kernel version
Ubuntu10.04/32bit	2.6.32-21-generic
Ubuntu10.10/32bit	2.6.35-22-generic
Ubuntu11.04/32bit	2.6.38-8-generic
Ubuntu11.10/32bit	3.0.0-12-generic
Fedora13/32bit	2.6.33.3-85.fc13.i686.PAE
Fedora14/32bit	2.6.35.6-45.fc14.i686
Fedora15/32bit	2.6.38.6-26.rc1.fc15.i686.PAE
Mint10/32bit	2.6.35-22-generic
Mint11/32bit	2.6.38-8-generic
Mint12/32bit	3.0.0-12-generic

## 2 Driver install and uninstall

### 2.1 Driver install

- a) Copy driver

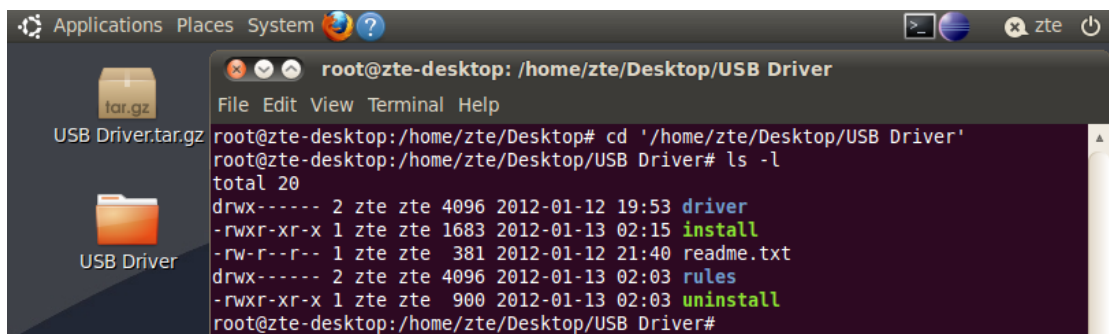
Login the system with root account in terminal, copy the "USB Driver.tar.gz" package to your local computer folder (such as "~/Desktop")

- b) Extract the package you have just copied

- c) Enter the extracted file directory , run the command :

```
# cd '~/ Desktop/ USB Driver'
```

then you will see some files as the following:



The screenshot shows a terminal window titled "root@zte-desktop: /home/zte/Desktop/USB Driver". The terminal output is as follows:

```
root@zte-desktop:/home/zte/Desktop# cd '/home/zte/Desktop/USB Driver'
root@zte-desktop:/home/zte/Desktop/USB Driver# ls -l
total 20
drwx----- 2 zte zte 4096 2012-01-12 19:53 driver
-rwxr-xr-x 1 zte zte 1683 2012-01-13 02:15 install
-rw-r--r-- 1 zte zte 381 2012-01-12 21:40 readme.txt
drwx----- 2 zte zte 4096 2012-01-13 02:03 rules
-rwxr-xr-x 1 zte zte 900 2012-01-13 02:03 uninstall
root@zte-desktop:/home/zte/Desktop/USB Driver#
```

- d) Add execution privilege for the "install" and "uninstall" files

---

run the command: `# chmod a+x install uninstall`

e) For driver installing, run the command:

```
# ./install
```

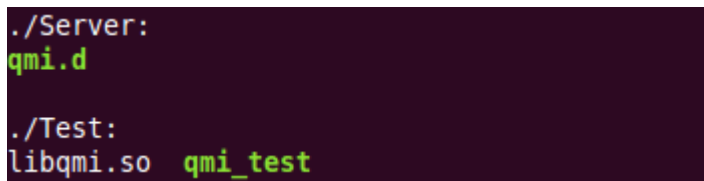
## 2.2 Driver uninstall

For driver uninstalling, run the command: `# ./uninstall`

# 3 Connect to network

## 3.1 Necessary files

All the necessary files: qmi.d, libqmi.so, qmi\_test



```
./Server:
qmi.d
./Test:
libqmi.so qmi_test
```

## 3.2 Start qmi server

login the terminal with root account, then run:

```
# cd Server
```

```
# chmod +x qmi.d
```

```
# ./qmi.d
```

## 3.3 Run app

run the qmi\_test app with your apn name as parameter

```
# cd Test
```

```
# chmod +x qmi_test
```

```
# ./qmi_test your_apn
```

## 3.4 Get IP

login to another terminal with root account, through 'dhclient' cmd with network interface name to get IP.

a) Check network interface, run the command: `# ls /dev/cdcecm*`

```
zte@zte-desktop: ~/Desktop
File Edit View Terminal Tabs Help
zte@zte-desktop: ~/Desktop x root@zte-desktop: /home/zte/Desktop
zte@zte-desktop:~/Desktop$ ls /dev/cdcecm*
/dev/cdcecm_usb0
zte@zte-desktop:~/Desktop$
```

The content after "cdcecm\_" is your interface name.

- b) Then you can get IP use your interface name, such as: `# dhclient usb0`

### 3.5 Exit

please input "quit" to exit.

## 4 Change basic functions and check some information

### 4.1 Serial communication program: minicom

### 4.2 Serial console

After driver installed, there will be four ports: "/dev/ttyUSB0", "/dev/ttyUSB1", "/dev/ttyUSB2", "/dev/ttyUSB3". And port "/dev/ttyUSB2" is used for "AT" commands to control the modem.

### 4.3 Minicom configuration

- a) enter configure mode

run the command: `# minicom -s`

```
root@zte-desktop: /home/zte
File Edit View Terminal Help
root@zte-desktop:/home/zte# ls /dev/ttyU*
/dev/ttyUSB0 /dev/ttyUSB1 /dev/ttyUSB2 /dev/ttyUSB3
root@zte-desktop:/home/zte# minicom -s
```

- b) select "Serial port setup", and press enter

```
+-----[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            |
+-----+-----+

```

- c) input "a", and input "/dev/ttyUSB2" after the item "Serial Device"

```
+-----+
| A -   Serial Device       : /dev/ttyUSB2
| B - Lockfile Location    : /var/lock
| C -   Callin Program     :
| D -   Callout Program    :
| E -   Bps/Par/Bits       : 115200 8N1
| F - Hardware Flow Control : Yes
| G - Software Flow Control : No
|
| Change which setting?
+-----+
```

- d) press twice enter and select "Save setup as dfl", then press enter

```
+-----[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      |
+-----+
```

- e) select "Exit", then press enter .

you can input "AT" commands now.

If you can't see what you inputted, please input "ATE", and press enter.

```
root@zte-desktop: /home/zte
File Edit View Terminal Help

Welcome to minicom 2.4

OPTIONS: I18n
Compiled on Jan 25 2010, 06:49:09.
Port /dev/ttyUSB2

Press CTRL-A Z for help on special keys

AT S7=45 S0=0 L1 V1 X4 &c1 E1 Q0
OK
at
OK
at+zsnt?
+ZSNT: 1,0,0
OK
```

- f) quit



---

more attentions, if you send wrong PUK more than 10 times, your SIM card will be locked, and you have to find the operator for help.

#### 4.4.3 How to check signal strength?

Answer: You can Use AT+CSQ to get current network signal strength. Execution command +CSQ returns received signal strength indication <rsqi> and channel bit error rate <ber> from the MT, rssi and ver defined value is following:

```
<rsqi>:
0      113 dBm or less
1      111 dBm
2...30  109...  53 dBm
31     51 dBm or greater
99     not known or not detectable
<ber> (in percent):
0...7   as RXQUAL values in the table in GSM 05.08 [20] subclause 8.2.4
99     not known or not detectable
```

For example:

Command: AT+CSQ

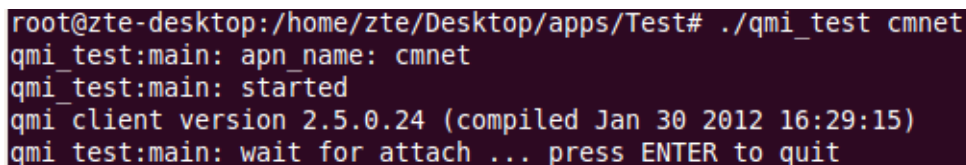
Response: +CSQ: 30, 99

OK

Rssi value is 30, ber is 99, and correct work is when rssi signal is in range <6; 31> (<-101dBm;-51dBm>)

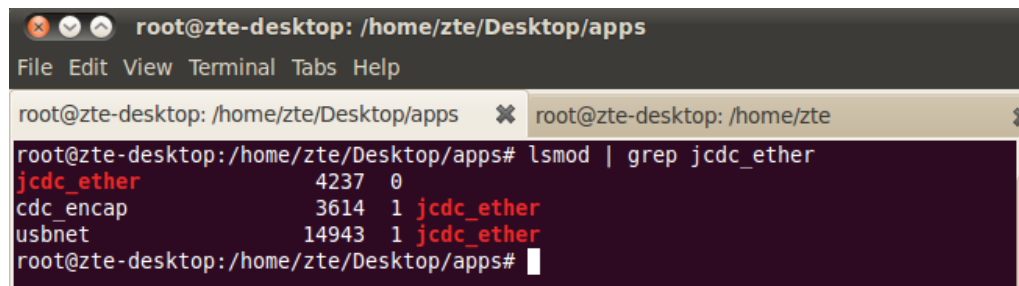
## 5 Problem and Resolution

### 5.1 Attach for a long time problem



```
root@zte-desktop:/home/zte/Desktop/apps/Test# ./qmi_test cmnet
qmi_test:main: apn_name: cmnet
qmi_test:main: started
qmi_client version 2.5.0.24 (compiled Jan 30 2012 16:29:15)
qmi_test:main: wait for attach ... press ENTER to quit
```

Resolution: install driver through the illustrate above, then you will see the picture below after finished.



```
root@zte-desktop: /home/zte/Desktop/apps
File Edit View Terminal Tabs Help
root@zte-desktop: /home/zte/Desktop/apps x root@zte-desktop: /home/zte x
root@zte-desktop:/home/zte/Desktop/apps# lsmod | grep jcdc_ether
jcdc_ether          4237  0
cdc_encap           3614  1 jcdc_ether
usbnet              14943  1 jcdc_ether
root@zte-desktop:/home/zte/Desktop/apps#
```

### 5.2 Server program not run



```
zte@zte-desktop: ~/Desktop/apps/Test
File Edit View Terminal Tabs Help

zte@zte-desktop: ~/Deskt... x root@zte-desktop: /home/z... x root@zte-desktop: /home/zte x

zte@zte-desktop:~/Desktop/apps$ ls
Server Test
zte@zte-desktop:~/Desktop/apps$ cd Test/
zte@zte-desktop:~/Desktop/apps/Test$ ls
libqmi.so qmi_test
zte@zte-desktop:~/Desktop/apps/Test$ ./qmi_test cmnet
qmi_test:main: apn_name: cmnet
qmi_test:main: started
qmi_client version 2.5.0.24 (compiled Jan 30 2012 16:29:15)
qmi_test:main: cannot register, 1(Operation failed)
qmi_test:main: done
zte@zte-desktop:~/Desktop/apps/Test$
```

Resolution: run the server refer to the follow method

```
root@zte-desktop: /home/zte/Desktop/apps
File Edit View Terminal Tabs Help

root@zte-desktop: /home/zte/Desktop/apps x root@zte-desktop: /home/zte x

root@zte-desktop:/home/zte/Desktop/apps# ls
Server Test
root@zte-desktop:/home/zte/Desktop/apps# ps -A | grep qmi.d
root@zte-desktop:/home/zte/Desktop/apps# cd Server/
root@zte-desktop:/home/zte/Desktop/apps/Server# ls
qmi.d
root@zte-desktop:/home/zte/Desktop/apps/Server# ./qmi.d
root@zte-desktop:/home/zte/Desktop/apps/Server# cd ..
root@zte-desktop:/home/zte/Desktop/apps# ps -A | grep qmi.d
8085 ?          00:00:00 qmi.d
root@zte-desktop:/home/zte/Desktop/apps#
```

### 5.3 Can not connect the network

```
zte@zte-desktop: ~/Desktop/apps/Test
File Edit View Terminal Tabs Help

zte@zte-desktop: ~/Deskt... x root@zte-desktop: /home/z... x root@zte-desktop: /home/zte x

zte@zte-desktop:~/Desktop/apps$ ls
Server Test
zte@zte-desktop:~/Desktop/apps$ cd Test/
zte@zte-desktop:~/Desktop/apps/Test$ ls
libqmi.so qmi_test
zte@zte-desktop:~/Desktop/apps/Test$ ./qmi_test cmnet
qmi_test:main: apn_name: cmnet
qmi_test:main: started
qmi_client version 2.5.0.24 (compiled Jan 30 2012 16:29:15)
qmi_test:main: cannot register, 1(Operation failed)
qmi_test:main: done
zte@zte-desktop:~/Desktop/apps/Test$ ./qmi_test cmnet
qmi_test:main: apn_name: cmnet
qmi_test:main: started
qmi_client version 2.5.0.24 (compiled Jan 30 2012 16:29:15)
qmi_test:main: wait for attach ... press ENTER to quit
qmi_test:attach: entered
qmi_test:attach: user client is ready
qmi_test:attach: interface name: usb0
qmi_test:attach: versions: CTL 1.5, WDS 1.12, DMS 1.6, NAS 1.8, QOS 1.3
qmi_test:attach: Failed to connect, err "Protocol error", call_end_reason 0
```

Resolution: apn may be incorrected, or device didn't register to the network.

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## 6 Success Logs

### 6.1 Connect successfully

```
zte@zte-desktop:~/Desktop/apps/Test$ ./qmi_test cmnet
qmi_test:main: apn_name: cmnet
qmi_test:main: started
qmi_client version 2.5.0.24 (compiled Jan 30 2012 16:29:15)
qmi_test:main: wait for attach ... input "quit" to exit
qmi_test:attach: entered
qmi_test:attach: user client is ready
qmi_test:attach: interface name: usb0
qmi_test:attach: versions: CTL 1.5, WDS 1.12, DMS 1.6, NAS 1.8, QOS 1.3
qmi_test:attach: Connected ...
qmi_test:qmi_event_cb: connection state 2, reconfig 0, call_end_reason 0
qmi_test:qmi_event_cb: Do not qmi_get_runtime_settings
qmi_test:qmi_event_cb: dormant 2
```

### 6.2 Request IP

```
root@zte-desktop:/home/zte/Desktop/apps# dhclient usb0
There is already a pid file /var/run/dhclient.pid with pid 2375
killed old client process, removed PID file
Internet Systems Consortium DHCP Client V3.1.3
Copyright 2004-2009 Internet Systems Consortium.
All rights reserved.
For info, please visit https://www.isc.org/software/dhcp/

Listening on LPF/usb0/9a:2a:9f:ef:ae:5c
Sending on LPF/usb0/9a:2a:9f:ef:ae:5c
Sending on Socket/fallback
DHCPDISCOVER on usb0 to 255.255.255.255 port 67 interval 3
DHCPOFFER of 10.198.123.139 from 10.198.123.137
DHCPREQUEST of 10.198.123.139 on usb0 to 255.255.255.255 port 67
DHCPACK of 10.198.123.139 from 10.198.123.137
bound to 10.198.123.139 -- renewal in 3577 seconds.
```

### 6.3 Check configure information and the network connection

```
root@zte-desktop:/home/zte/Desktop/apps# ifconfig usb0
usb0    Link encap:Ethernet HWaddr 9a:2a:9f:ef:ae:5c
        inet addr:10.198.123.139 Bcast:10.198.123.143 Mask:255.255.255.248
        inet6 addr: fe80::982a:9fff:feef:ae5c/64 Scope:Link
        UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1
        RX packets:2 errors:0 dropped:0 overruns:0 frame:0
        TX packets:53 errors:0 dropped:0 overruns:0 carrier:0
        collisions:0 txqueuelen:1000
        RX bytes:646 (646.0 B) TX bytes:12960 (12.9 KB)

root@zte-desktop:/home/zte/Desktop/apps# route -n
Kernel IP routing table
Destination Gateway Genmask Flags Metric Ref Use Iface
10.198.123.136 0.0.0.0 255.255.255.248 U 0 0 0 usb0
0.0.0.0 10.198.123.137 0.0.0.0 UG 0 0 0 usb0
root@zte-desktop:/home/zte/Desktop/apps# cat /etc/resolv.conf
nameserver 211.137.130.19
nameserver 211.137.130.3
root@zte-desktop:/home/zte/Desktop/apps# ping www.sina.com.cn
PING cmnetnews.sina.com.cn (221.179.180.76) 56(84) bytes of data.
64 bytes from 221.179.180.76: icmp_seq=1 ttl=53 time=323 ms
64 bytes from 221.179.180.76: icmp_seq=2 ttl=53 time=775 ms
```