TP-LINK®

Installation Guide
For
Linux Driver

REV1.0.0
1910011538

Contents

1. Development Environment

System version: Ubuntu 14.04.1
Kernel version: 3.16.0-30-generic
Gcc version：4.8.2

2. Compile the Driver

Before you compile the driver, please make sure you have the correct compile tool and kernel sources.
We can install compile tool gcc by command “apt-get install gcc”
Note : We recommend you use a suitable compile tool to compile our driver.
For example:

```
tplinku@tplinku-Vostro-3900:~$ cat /proc/version
Linux version 3.13.0-35-generic (buildd@roseapple) (gcc version 4.8.2 (Ubuntu 4.
8.2-19ubuntu1) ) #62-Ubuntu SMP Fri Aug 15 01:58:01 UTC 2014
tplinku@tplinku-Vostro-3900:~$
```

According to the command “cat /proc/version”, we could see your linux system is compiled by gcc4.8.2. So we recommend you use gcc4.8.2 to compile our driver if possible.

To compile the driver:

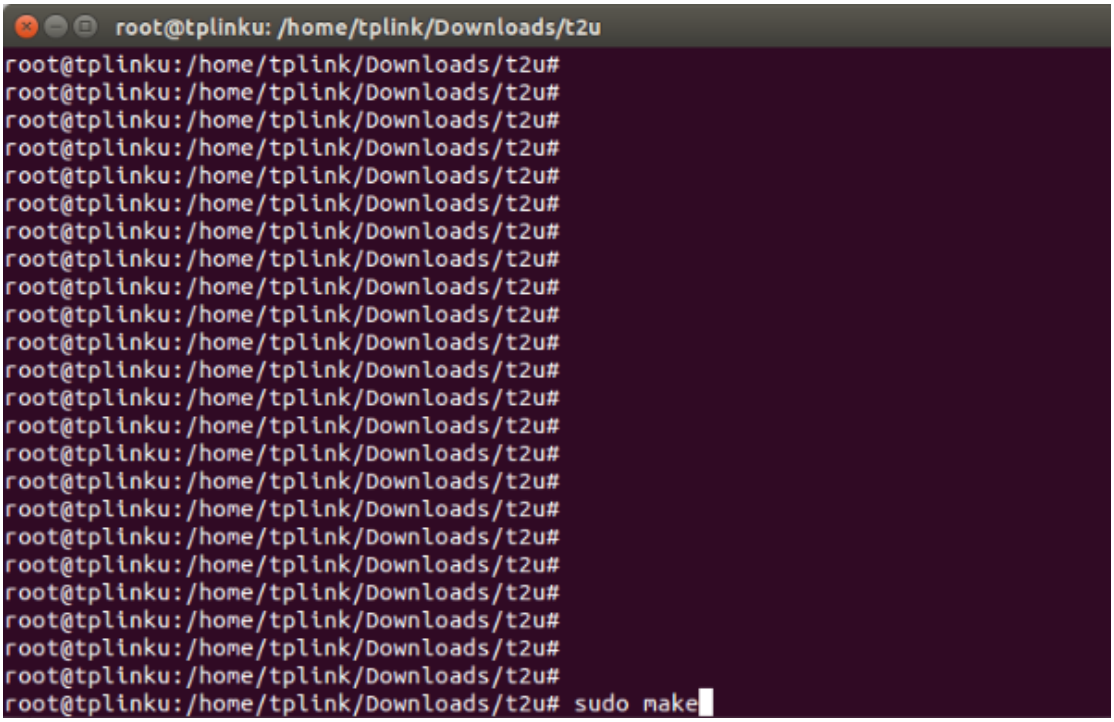
1. Access the directory of driver.
2. Before compile, make sure the the path in makefile.c is suitable for your compile environment of your Linux system.

```
ifeq ($(WIFI_MODE),)
RT28xx_MODE = STA
else
RT28xx_MODE = $(WIFI_MODE)
endif
ifeq ($(TARGET),)
TARGET = LINUX
endif
```

```
#PLATFORM: Target platform
PLATFORM = PC
```

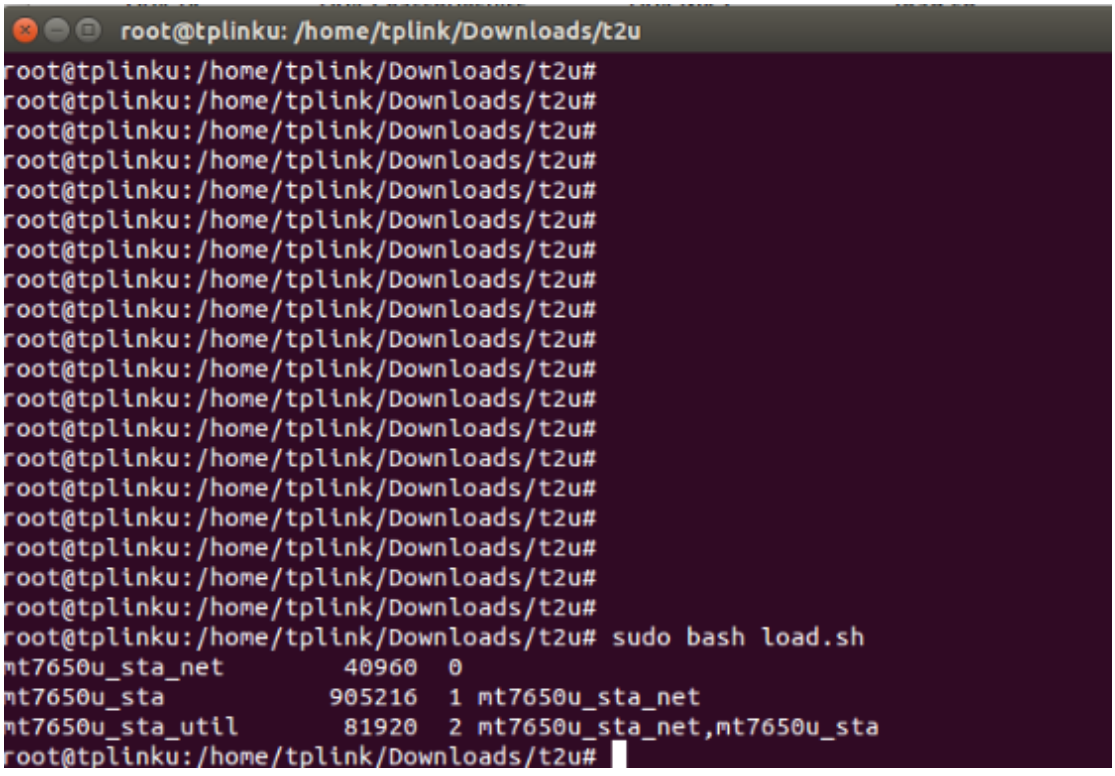
```
ifeq ($(PLATFORM),PC)
# Linux 2.6
LINUX_SRC = /lib/modules/$(shell uname -r)/build
# Linux 2.4 Change to your local setting
#LINUX_SRC = /usr/src/linux-2.4
LINUX_SRC_MODULE = /lib/modules/$(shell uname -r)/kernel/drivers/net/wireless/
CROSS_COMPILE =
endif
```

3. Type “sudo make” to compile the driver file.



3. Load the Driver

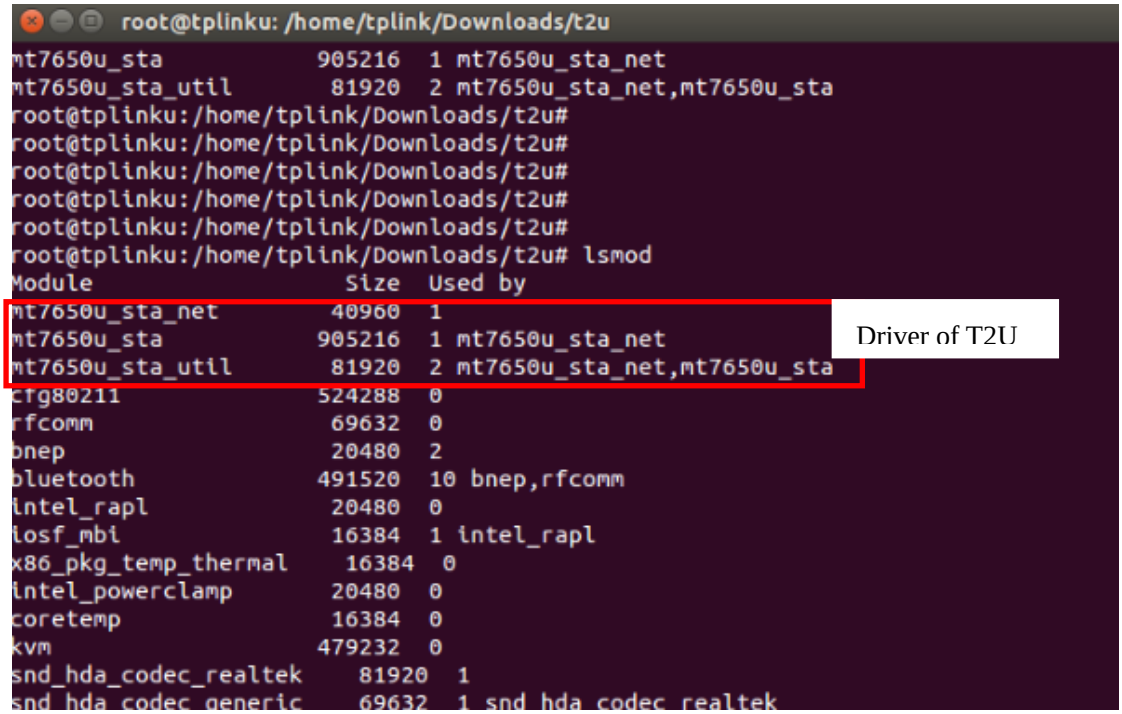
1) Go to the directory of the original driver file to run the command “sudo bash load.sh”



If it’s fail to run the load.sh, please type:
“rm -rf /etc/Wireless/RT2870STA/”

“mkdir /etc/Wireless/RT2870STA/”
“cp ./MODULE/conf/RT2870STA.dat /etc/Wireless/RT2870STA/RT2870STA.dat”
“chmod 777 -R /etc/Wireless/RT2870STA”
“insmod ./UTIL/os/linux/mt7650u_sta_util.ko”
“insmod ./MODULE/os/linux/mt7650u_sta.ko”
“insmod ./NETIF/os/linux/mt7650u_sta_net.ko”
“lsmod | grep "mt7650"“
“ifconfig ra0 up”

2) Type “lsmod” to check if the driver is successfully loaded.



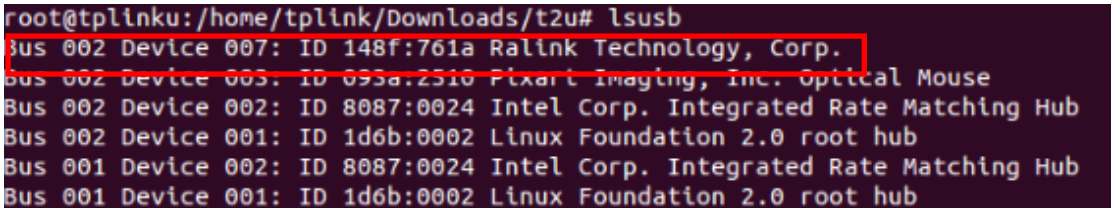
If you want to unload the driver, run the following command in the same directory.

```
sudo bash unload.sh
```

4. Join the Wireless Network

4.1.1. Identify the device

After the driver is successfully loaded, insert the USB adapter and type “lsusb” to check if the adapter is identified.



4.1.2. Create the interface

Type “ifconfig –a” to check if the wireless network interface is created.

4.1.3. Change the interface status to up

Check if the WLAN interface is up. If not, type “ifconfig ra0 up”.

4.1.4. Scan AP and see results

Run the following command to scan the signals.

```
sudo iwpriv ra0 set SiteSurvey=1
sudo iwpriv ra0 get_site_survey
```

```
tplinku@tplinku-Vostro-3900:~/Downloads/t2u$ sudo iwpriv ra0 set SiteSurvey=1
tplinku@tplinku-Vostro-3900:~/Downloads/t2u$ sudo iwpriv ra0 get_site_survey
ra0       get_site_survey:
Ch  SSID                            BSSID              Security              Siganl(%)W-Mode  ExtCH  NT
1   WWW                             64:66:b3:93:b4:87  WPA2PSK/AES           100      11b/g/n ABOVE  In
1   hello                           10:fe:ed:e9:71:76  WPA1PSKWPA2PSK/TKIPAES 100     11b/g/n ABOVE  In
11  TP-LINK_41B1                    e8:de:27:d3:41:b1  WPA2PSK/AES           100      11b/g/n NONE   In
1   TP-LINK_wpa281                  f8:d1:11:a5:2e:a2  WPA1PSKWPA2PSK/TKIPAES 78      11b/g/n ABOVE  In
3   ssid1                           c4:e9:84:59:4b:59  WPA1PSKWPA2PSK/TKIPAES 100     11b/g/n NONE   In
3   ssid2                           06:e9:84:59:4b:59  WPA1PSKWPA2PSK/TKIPAES 100     11b/g/n NONE   In
3   ssid3                           16:e9:84:59:4b:59  WPA1PSKWPA2PSK/TKIPAES 44      11b/g/n NONE   In
4   TP-LINK_C2_2.4G                 c4:6e:1f:73:19:04  WPA2PSK/AES           94       11b/g/n ABOVE  In
6   TP-LINK_AP_1234                 f4:f2:6d:8c:8a:76  NONE                  100      11b/g/n BELOW  In
6   TP-LINK_93C170                  64:66:b3:93:c1:70  WPA1PSKWPA2PSK/TKIPAES 100     11b/g/n BELOW  In
6   TP-LINK_EDD15E                  64:70:02:ed:d1:5e  WPA1PSKWPA2PSK/TKIPAES 89      11b/g/n BELOW  In
6   TP-LINK_2.4GHz_A2EB4B           f8:1a:67:a2:eb:4b  WPA1PSKWPA2PSK/AES    100      11b/g/n NONE   In
6   TP-LINK_130969                  00:0a:eb:13:09:69  NONE                  100      11b/g/n ABOVE  In
6   123                             c4:e9:84:77:cf:56  WPA2PSK/AES           100      11b/g/n BELOW  In
6   Cathy                           60:e3:27:29:d9:0e  WPA2PSK/AES           89       11b/g/n NONE   In
6                                   e8:94:f6:79:b1:e0  WPA1PSKWPA2PSK/AES    100      11b/g/n ABOVE  In
7   AP_vlan1                        6e:66:b3:64:20:e6  NONE                  100      11b/g/n BELOW  In
7   AP_vlan2                        64:66:b3:64:20:e6  NONE                  100      11b/g/n BELOW  In
7   AP_vlan3                        62:66:b3:64:20:e6  NONE                  100      11b/g/n BELOW  In
9   TP-LINK_2408                    60:e3:27:58:24:08  WPA2PSK/AES           86       11b/g/n BELOW  In
10  TP-LINK_3592                    c4:e9:84:9b:35:92  WPA2PSK/AES           89       11b/g/n BELOW  In
11  666                             60:e3:27:f1:7a:c5  WPA2PSK/AES           99       11b/g/n NONE   In
11  xiaozhu                         60:e3:27:3b:f5:ad  WPA2PSK/AES           100      11b/g/n NONE   In
11  AP500                           f4:f2:6d:6a:b2:4d  WPA2PSK/AES           100      11b/g/n BELOW  In
11  TP-LINK_AAF8                    c0:4a:00:0a:aa:f8  WPA1PSKWPA2PSK/AES    96       11b/g/n NONE   In
11  IPcameraTest2.4                 e8:de:27:70:15:55  WPA1PSKWPA2PSK/TKIPAES 100     11b/g/n NONE   In
```

4.1.5. AP Connect to the AP

1) Config STA to link with AP which is WPA2PSK/AES(Authentication/Encryption)

```
iwpriv ra0 set NetworkType=Infra
iwpriv ra0 set AuthMode=WPA2PSK
iwpriv ra0 set EncrypType=AES
iwpriv ra0 set SSID="AP's SSID"
iwpriv ra0 set WPAPSK="AP's wpa-preshared key"
iwpriv ra0 set SSID="AP's SSID"
```

Take SSID “IpcameraTest2.4” as an example:

```
tplinku@tplinku-Vostro-3900:~/Downloads/t2u$ sudo iwpriv ra0 set NetworkType=Infa
tplinku@tplinku-Vostro-3900:~/Downloads/t2u$ sudo iwpriv ra0 set AuthMOde=WPAPSK2
tplinku@tplinku-Vostro-3900:~/Downloads/t2u$ sudo iwpriv ra0 set EncrypType=AES
tplinku@tplinku-Vostro-3900:~/Downloads/t2u$ sudo iwpriv ra0 set SSID="IPcameraTest2.4"
tplinku@tplinku-Vostro-3900:~/Downloads/t2u$ sudo iwpriv ra0 set WPAPSK="12345678"
tplinku@tplinku-Vostro-3900:~/Downloads/t2u$ sudo iwpriv ra0 set SSID="IPcameraTest2.4"
tplinku@tplinku-Vostro-3900:~/Downloads/t2u$
```

2) Config STA to link with AP which is OPEN/NONE(Authentication/Encryption)

```
iwpriv ra0 set NetworkType=Infra
iwpriv ra0 set AuthMode=OPEN
iwpriv ra0 set EncrypType=NONE
iwpriv ra0 set SSID="AP's SSID"
```

3) Config STA to link with AP which is SHARED/WEP(Authentication/Encryption)

```
iwpriv ra0 set NetworkType=Infra
iwpriv ra0 set AuthMode=SHARED
iwpriv ra0 set EncrypType=WEP
iwpriv ra0 set DefaultKeyID=1
iwpriv ra0 set Key1="AP's wep key"
iwpriv ra0 set SSID="AP's SSID"
```

4) Config STA to link with AP which is WPAPSK/TKIP(Authentication/Encryption)

```
iwpriv ra0 set NetworkType=Infra
iwpriv ra0 set AuthMode=WPAPSK
iwpriv ra0 set EncrypType=TKIP
iwpriv ra0 set SSID="AP's SSID"
iwpriv ra0 set WPAPSK="AP's wpa-preshared key"
iwpriv ra0 set SSID="AP's SSID"
```

5) Config STA to link with AP which is WPAPSK/AES(Authentication/Encryption)

```
iwpriv ra0 set NetworkType=Infra
iwpriv ra0 set AuthMode=WPAPSK
iwpriv ra0 set EncrypType=AES
iwpriv ra0 set SSID="AP's SSID"
iwpriv ra0 set WPAPSK="AP's wpa-preshared key"
iwpriv ra0 set SSID="AP's SSID"
```

6) Config STA to link with AP which is WPA2PSK/TKIP(Authentication/Encryption)

```
iwpriv ra0 set NetworkType=Infra
iwpriv ra0 set AuthMode=WPA2PSK
iwpriv ra0 set EncrypType=TKIP
iwpriv ra0 set SSID="AP's SSID"
iwpriv ra0 set WPAPSK=12345678
iwpriv ra0 set SSID="AP's SSID"
```

Note: if you want to establish a 11AC connection, type “iwpriv ra0 set WirelessMode=14” or “iwpriv ra0 set WirelessMode=15” before type” iwpriv ra0 set SSID="AP's SSID"“.

4.1.6. Enable DHCP client

1) Type “iwconfig ra0” to check if your AP is connected successfully.

```
root@tplinku:/home/tplink/Downloads/t2u# iwconfig ra0
ra0       Ralink STA  ESSID:"IPCameraTest5"  Nickname:"MT7610U_STA"
          Mode:Managed  Frequency=5.765 GHz  Access Point: E8:DE:27:70:15:54
          Bit Rate=135 Mb/s
          RTS thr:off   Fragment thr:off
          Encryption key:0AFF-9D56-5FFF-46EE-DBF4-8DA0-D55F-ED36   Security mode
:open
          Link Quality=96/100  Signal level:-48 dBm  Noise level:-59 dBm
          Rx invalid nwid:0  Rx invalid crypt:0  Rx invalid frag:0
          Tx excessive retries:0  Invalid misc:0   Missed beacon:0
```

2) Type “dhclient ra0” to get an IP address.

After running the command, the adapter will get an IP assigned by the AP. Then you can run the ping command to check if the wireless connection is successful.

```
tplink@tplink-Inspiron-N4010:~/driver$ ifconfig
lo        Link encap:Local Loopback
          inet addr:127.0.0.1  Mask:255.0.0.0
          inet6 addr: ::1/128 Scope:Host
          UP LOOPBACK RUNNING  MTU:65536  Metric:1
          RX packets:295 errors:0 dropped:0 overruns:0 frame:0
          TX packets:295 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:0
          RX bytes:22543 (22.5 KB)  TX bytes:22543 (22.5 KB)

wlan1     Link encap:Ethernet  HWaddr c4:e9:84:1f:df:3c
          inet addr:192.168.1.102  Bcast:192.168.1.255  Mask:255.255.255.0
          inet6 addr: fe80::c6e9:84ff:fe1f:df3c/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:16 errors:0 dropped:699 overruns:0 frame:0
          TX packets:66 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:2068 (2.0 KB)  TX bytes:11368 (11.3 KB)

tplink@tplink-Inspiron-N4010:~/driver$ ping 192.168.1.1
PING 192.168.1.1 (192.168.1.1) 56(84) bytes of data.
64 bytes from 192.168.1.1: icmp_seq=1 ttl=254 time=11.8 ms
64 bytes from 192.168.1.1: icmp_seq=2 ttl=254 time=7.05 ms
64 bytes from 192.168.1.1: icmp_seq=3 ttl=254 time=1.97 ms
^C
--- 192.168.1.1 ping statistics ---
3 packets transmitted, 3 received, 0% packet loss, time 2003ms
rtt min/avg/max/mdev = 1.971/6.968/11.882/4.046 ms
tplink@tplink-Inspiron-N4010:~/driver$ route
Kernel IP routing table
Destination     Gateway         Genmask         Flags Metric Ref    Use Iface
default         192.168.1.1     0.0.0.0         UG    0      0        0 wlan1
192.168.1.0     *               255.255.255.0   U     0      0        0 wlan1
```

Note: Run the commands under the root account.