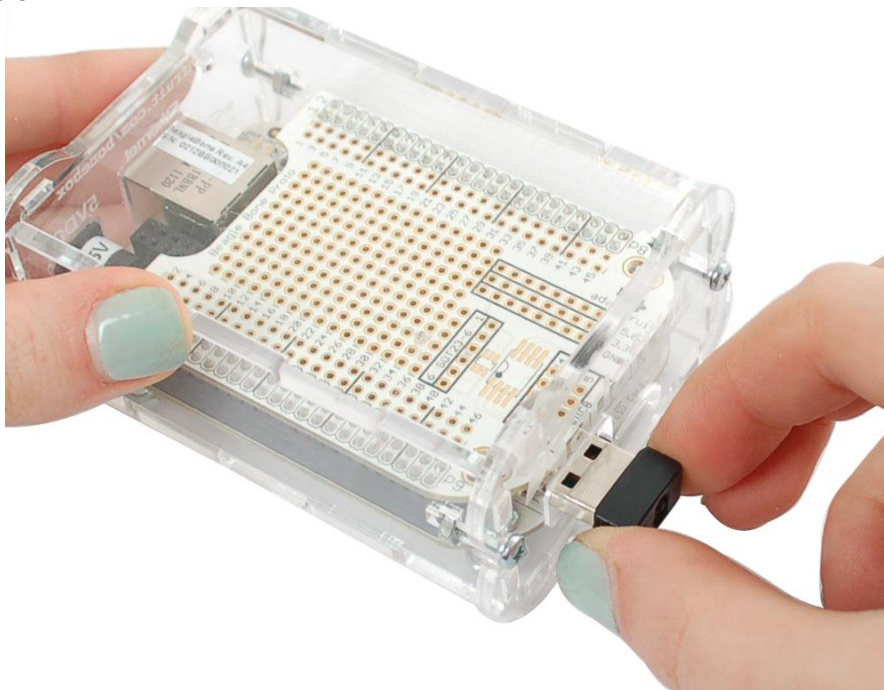


Tutorial

Introduction



Now that you have your Bone up and running, and Ethernet works, wouldn't it be nice to get rid of that Ethernet cable? Yeah, let's go WiFi! This tutorial is specifically for the verified WiFi adapter for Beagle Bone adapter in the Adafruit shop. It will not work with other WiFi adapters, as they all have different chipsets!

For this tutorial you will need:

- Beagle Bone
- WiFi adapter
- 5V 2000mA Power Adapter

Pick these parts up at the Adafruit shop!

Power and WiFi

The BeagleBone has the neat ability to power itself just through the mini USB port. However, this can cause some problems because the USB port cannot supply enough power for BOTH the Bone and a WiFi adapter.

Driver Install

You'll need to have Internet connectivity using Ethernet , and also be logged into the terminal to install the WiFi adapter's driver, so make sure to complete those tutorials first!

While logged in, type in `opkg update` and hit return, you should see the following

```

root@beaglebone:~# opkg update
Downloading http://feeds.angstrom-distribution.org/feeds/core/ipk/eglibc/armv7a/base/Packages.gz.
Inflating http://feeds.angstrom-distribution.org/feeds/core/ipk/eglibc/armv7a/base/Packages.gz.
Updated list of available packages in /var/lib/opkg/lists/base.
Downloading http://feeds.angstrom-distribution.org/feeds/core/ipk/eglibc/armv7a/machine/beaglebone/Packages.gz.
Inflating http://feeds.angstrom-distribution.org/feeds/core/ipk/eglibc/armv7a/machine/beaglebone/Packages.gz.
Updated list of available packages in /var/lib/opkg/lists/beaglebone.
Downloading http://feeds.angstrom-distribution.org/feeds/core/ipk/eglibc/armv7a/debug/Packages.gz.
Inflating http://feeds.angstrom-distribution.org/feeds/core/ipk/eglibc/armv7a/debug/Packages.gz.
Updated list of available packages in /var/lib/opkg/lists/debug.
Downloading http://feeds.angstrom-distribution.org/feeds/core/ipk/eglibc/armv7a/gstreamer/Packages.gz.
Inflating http://feeds.angstrom-distribution.org/feeds/core/ipk/eglibc/armv7a/gstreamer/Packages.gz.
Updated list of available packages in /var/lib/opkg/lists/gstreamer.
Downloading http://feeds.angstrom-distribution.org/feeds/core/ipk/eglibc/all/Packages.gz.
Inflating http://feeds.angstrom-distribution.org/feeds/core/ipk/eglibc/all/Packages.gz.
Updated list of available packages in /var/lib/opkg/lists/no-arch.
Downloading http://feeds.angstrom-distribution.org/feeds/core/ipk/eglibc/armv7a/perl/Packages.gz.
Inflating http://feeds.angstrom-distribution.org/feeds/core/ipk/eglibc/armv7a/perl/Packages.gz.
Updated list of available packages in /var/lib/opkg/lists/perl.
Downloading http://feeds.angstrom-distribution.org/feeds/core/ipk/eglibc/armv7a/python/Packages.gz.
Inflating http://feeds.angstrom-distribution.org/feeds/core/ipk/eglibc/armv7a/python/Packages.gz.
Updated list of available packages in /var/lib/opkg/lists/python.
root@beaglebone:~# _

```

then type in `opkg list linux-firmware-rt*` and hit return

```

root@beaglebone:~# opkg list linux-firmware-rt*
linux-firmware-rtl8192ce - 0.0+git1+d543c1d98fc240267ee59fff93f7a0f36d9e2fc3-r2 - linux-firmware version
0.0+git1+d543c1d98fc240267ee59fff93f7a0f36d9e2fc3-r2
  Firmware files for use with Linux kernel
linux-firmware-rtl8192cu - 0.0+git1+d543c1d98fc240267ee59fff93f7a0f36d9e2fc3-r2 - linux-firmware version
0.0+git1+d543c1d98fc240267ee59fff93f7a0f36d9e2fc3-r2
  Firmware files for use with Linux kernel
linux-firmware-rtl8192su - 0.0+git1+d543c1d98fc240267ee59fff93f7a0f36d9e2fc3-r2 - linux-firmware version
0.0+git1+d543c1d98fc240267ee59fff93f7a0f36d9e2fc3-r2
  Firmware files for use with Linux kernel
root@beaglebone:~#

```

Finally type in `opkg install linux-firmware-rtl8192cu` and press return. Plug in the WiFi dongle, then type in `reboot` and return to reboot the machine

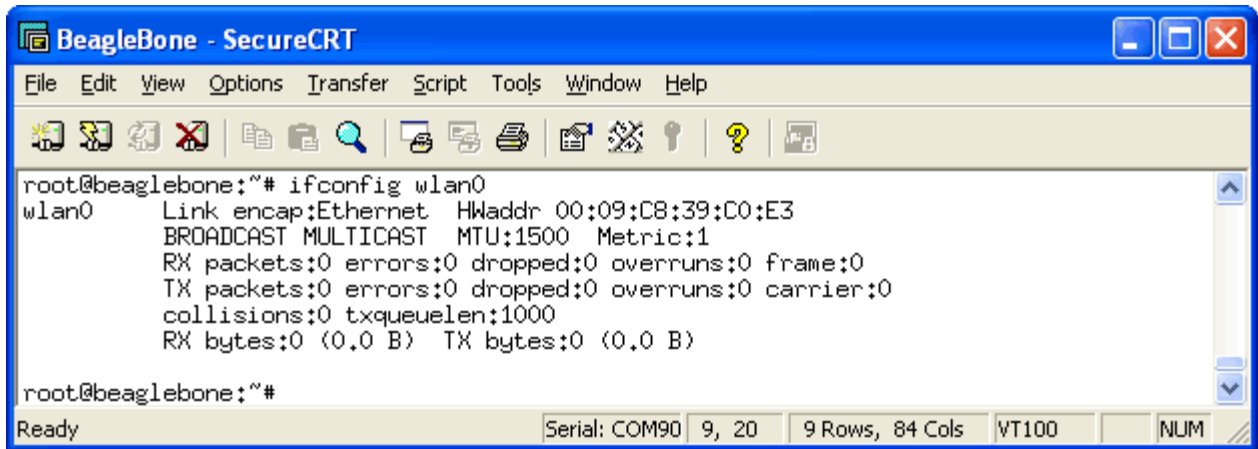
Now that its rebooted, check `dmesg` - you should see the following

```

root@beaglebone:~# dmesg | tail -6
[ 6.683811] rtl8192cu: MAC address: 00:09:c8:39:c0:e3
[ 6.683849] rtl8192cu: Board Type 0
[ 6.998600] gadget: high-speed config #1: Linux File-Backed Storage
[ 8.259629] rtlwifi: rx_max_size 15360, rx_urb_num 8, in_ep 1
[ 8.302618] ieee80211 phy0: Selected rate control algorithm 'rtl_rc'
[ 8.303641] usbcore: registered new interface driver rtl8192cu
root@beaglebone:~# █

```

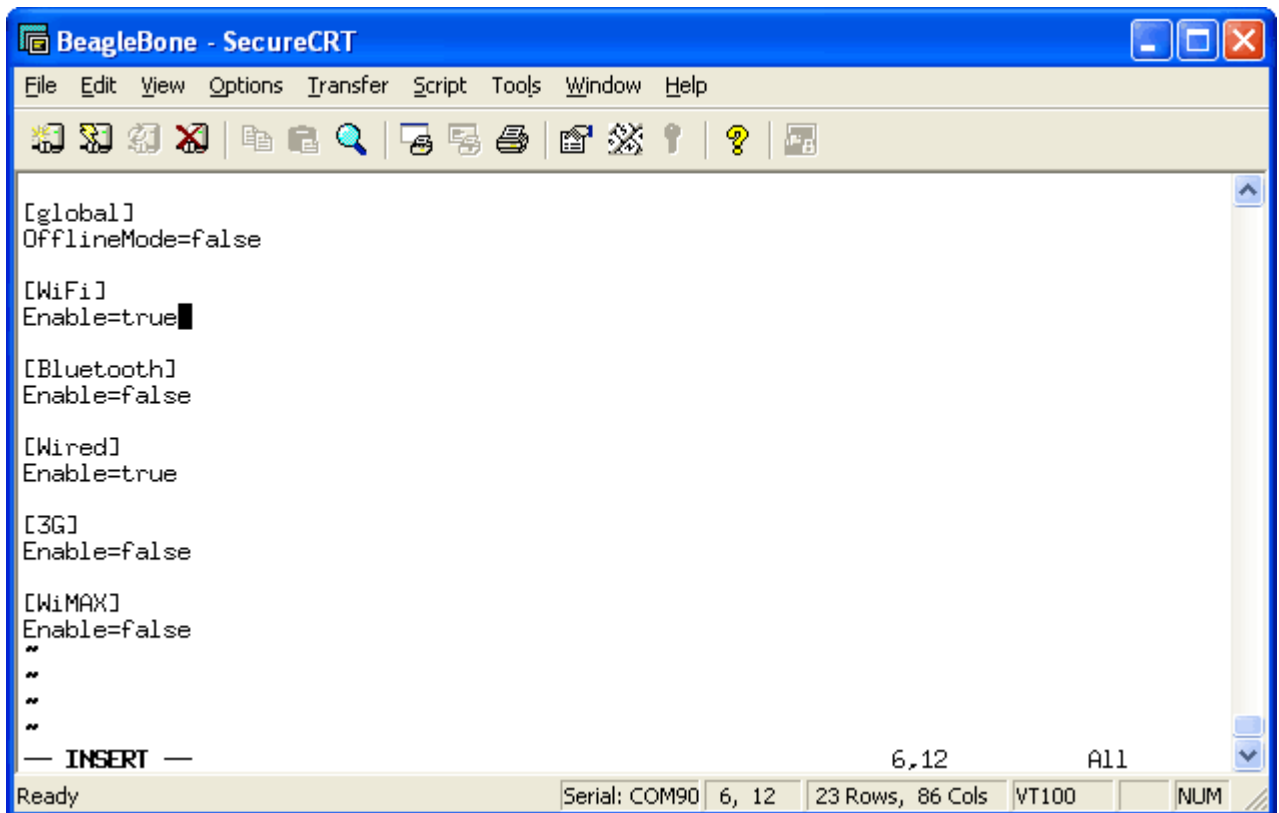
And if you type in `ifconfig wlan0` there should be a link, it wont be connected yet so there's a lot of 0's and no inet addr



```
BeagleBone - SecureCRT
File Edit View Options Transfer Script Tools Window Help
root@beaglebone:~# ifconfig wlan0
wlan0    Link encap:Ethernet  HWaddr 00:09:C8:39:C0:E3
         BROADCAST MULTICAST  MTU:1500  Metric:1
         RX packets:0 errors:0 dropped:0 overruns:0 frame:0
         TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
         collisions:0 txqueuelen:1000
         RX bytes:0 (0.0 B)  TX bytes:0 (0.0 B)

root@beaglebone:~#
Ready Serial: COM90 9, 20 9 Rows, 84 Cols VT100 NUM
```

Now we can set up the connection manager to automatically manage the wifi. Edit /var/lib/connman/settings (I use vi but nano is also installed) and change WiFi from false to true, save it



```
BeagleBone - SecureCRT
File Edit View Options Transfer Script Tools Window Help
[global]
OfflineMode=false

[WiFi]
Enable=true

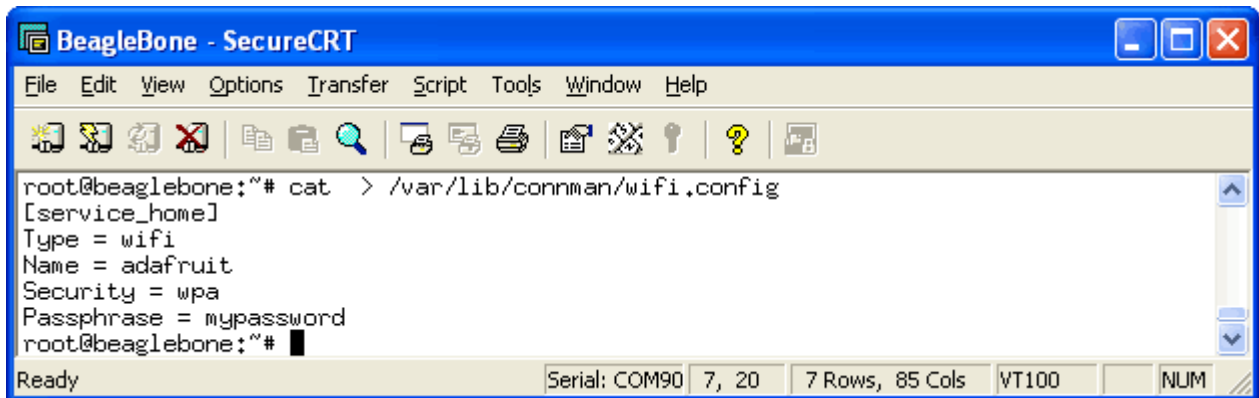
[Bluetooth]
Enable=false

[Wired]
Enable=true

[3G]
Enable=false

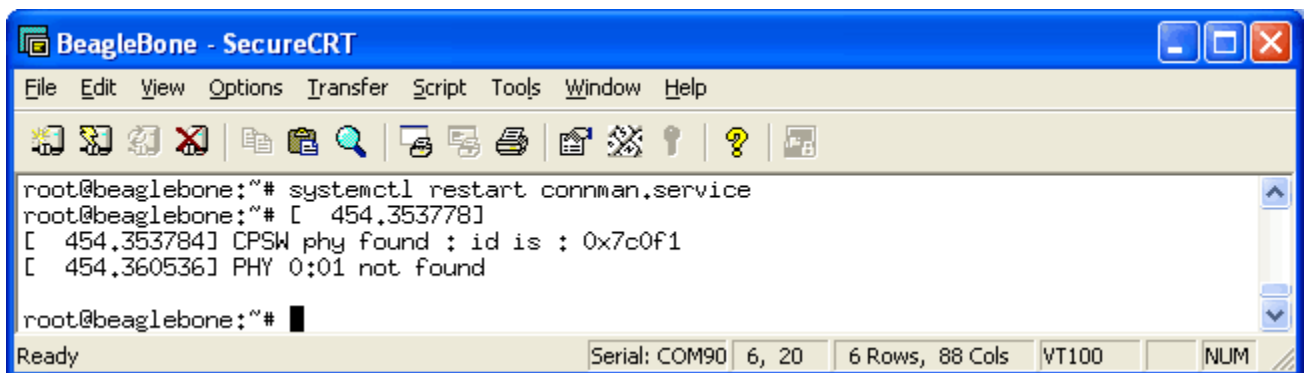
[WiMAX]
Enable=false
"
"
"
— INSERT —
6,12 All
Ready Serial: COM90 6, 12 23 Rows, 86 Cols VT100 NUM
```

Create a file /var/lib/connman/wifi.config with your settings as shown below, starting with the [service_home] line and with a return after the Passphrase line, of course this should match your home network, not the adafruit one!



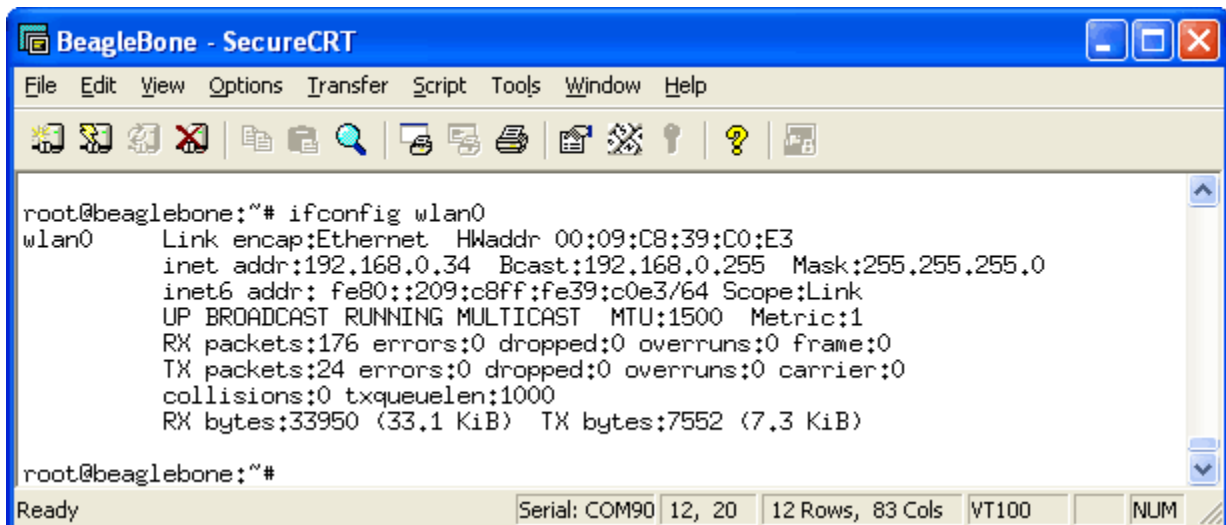
```
BeagleBone - SecureCRT
File Edit View Options Transfer Script Tools Window Help
root@beaglebone:~# cat > /var/lib/connman/wifi.config
[service_home]
Type = wifi
Name = adafruit
Security = wpa
Passphrase = mypassword
root@beaglebone:~#
```

Restart connman to get it to accept the new settings:



```
BeagleBone - SecureCRT
File Edit View Options Transfer Script Tools Window Help
root@beaglebone:~# systemctl restart connman.service
root@beaglebone:~# [ 454.353778]
[ 454.353784] CPSW phy found : id is : 0x7c0f1
[ 454.360536] PHY 0:01 not found
root@beaglebone:~#
```

After less than 30 seconds or so, you should be connected:



```
BeagleBone - SecureCRT
File Edit View Options Transfer Script Tools Window Help
root@beaglebone:~# ifconfig wlan0
wlan0      Link encap:Ethernet HWaddr 00:09:C8:39:D0:E3
          inet addr:192.168.0.34 Bcast:192.168.0.255 Mask:255.255.255.0
          inet6 addr: fe80::209:c8ff:fe39:c0e3/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1
          RX packets:176 errors:0 dropped:0 overruns:0 frame:0
          TX packets:24 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:33950 (33.1 KiB) TX bytes:7552 (7.3 KiB)
root@beaglebone:~#
```

There should now be an inet addr You can then test pinging an IP address and a domain name

```
BeagleBone - SecureCRT
File Edit View Options Transfer Script Tools Window Help
root@beaglebone:~# ping 18.70.0.160
PING 18.70.0.160 (18.70.0.160) 56(84) bytes of data.
64 bytes from 18.70.0.160: icmp_req=1 ttl=51 time=49.4 ms
64 bytes from 18.70.0.160: icmp_req=2 ttl=51 time=47.6 ms
64 bytes from 18.70.0.160: icmp_req=3 ttl=51 time=47.9 ms
64 bytes from 18.70.0.160: icmp_req=4 ttl=51 time=39.2 ms
^V64 bytes from 18.70.0.160: icmp_req=5 ttl=51 time=76.5 ms
^C
--- 18.70.0.160 ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 4006ms
rtt min/avg/max/mdev = 39.235/52.170/76.574/12.718 ms
root@beaglebone:~#
```

```
BeagleBone - SecureCRT
File Edit View Options Transfer Script Tools Window Help
root@beaglebone:~# ping www.google.com
PING www.l.google.com (173.194.73.105) 56(84) bytes of data.
64 bytes from vb-in-f105.1e100.net (173.194.73.105): icmp_req=1 ttl=46 time=47.3 ms
64 bytes from vb-in-f105.1e100.net (173.194.73.105): icmp_req=2 ttl=46 time=38.5 ms
64 bytes from vb-in-f105.1e100.net (173.194.73.105): icmp_req=3 ttl=46 time=44.5 ms
64 bytes from vb-in-f105.1e100.net (173.194.73.105): icmp_req=4 ttl=46 time=44.8 ms
64 bytes from vb-in-f105.1e100.net (173.194.73.105): icmp_req=5 ttl=46 time=37.8 ms
^C
--- www.l.google.com ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 4006ms
rtt min/avg/max/mdev = 37.847/42.635/47.393/3.775 ms
root@beaglebone:~#
```

Finally, if you want more detailed information about your link you can opkg install wireless-tools to get the iwconfig command, which will give you tons of details.

```
BeagleBone - SecureCRT
File Edit View Options Transfer Script Tools Window Help
root@beaglebone:~# iwconfig
-sh: iwconfig: command not found
root@beaglebone:~# opkg install wireless-tools
Installing wireless-tools (1:29-r4) to root...
Downloading http://feeds.angstrom-distribution.org/feeds/core/ipk/egllibc/armv7a/base/wireless-tools_29-r4_armv7a.ipk.
Configuring wireless-tools.
root@beaglebone:~#
```

```
BeagleBone - SecureCRT
File Edit View Options Transfer Script Tools Window Help
root@beaglebone:~# iwconfig wlan0
wlan0 IEEE 802.11bgn ESSID:"adafruit"
Mode:Managed Frequency:2.412 GHz Access Point: 90:84:0D:DE:70:57
Bit Rate=1 Mb/s Tx-Power=20 dBm
Retry long limit:7 RTS thr=2347 B Fragment thr:off
Encryption key:off
Power Management:off
Link Quality=31/70 Signal level=-79 dBm
Rx invalid nwid:0 Rx invalid crypt:0 Rx invalid frag:0
Tx excessive retries:0 Invalid misc:59 Missed beacon:0
root@beaglebone:~#
```

Troubleshooting

If you get an error device descriptor read/64, error -71, reboot and stop the boot process with the space bar. Then add the following boot option with the follow at the U-Boot prompt

```
setenv bootargs irqpoll RETURN
```

```
boot RETURN
```