

Raspberry Pi B+ Setup & Configuration

Environment

Setup Platform:

Windows 8.1

Raspberry Pi:

Board:

Wireless Adapter: Edimax 150Mbps Wireless 802.11b/g/n nano USB Adapter, Model EW-7811Un

Software: Raspbian OS

Caveats

Without a properly configured & booting sd-card, no video will be put out at all!

Install OS

First Boot & Initial Configuration

Wireless Network Configuration

1. First, let's make sure your wireless hardware is correctly working

Perform a wireless survey via commandline:

```
iwlist wlan0 scan
```

If the scan fails, try it a few more times.

In my experience, I've had to scan more than once to get a

good survey.

2. Edit the interfaces config file

```
sudo vi /etc/network/interfaces
#Change as follows:
allow-hotplug wlan0 #Applies to plug-n-play hardware such as
USB, specify the interface name (e.g. wlan0)
iface wlan0 inet dhcp #Specify dhcp for the interface
wpa-conf /etc/wpa_supplicant/wpa_supplicant.conf #Applies to
Wi-Fi Protected Access client wpa_supplicant/
pre-up wpa_supplicant -B w -D wext -i wlan0 -
c/etc/wpa_supplicant/wpa_supplicant.conf #Specify preflight
command for wpa initialization
post-down killall -q wpa_supplicant #Specify post command for
wpa stop
```

Important: Notice the lack of a space after the -c switch in the wpa_supplicant command. That is purposeful!

3. Next, we are going to be using the wpa_passphrase command to generate the encrypted passphrase that will be used in the wpa_supplicant.conf file referenced in the interface config

```
#Call the wpa_passphrase command with the Wireless SSID and the
Password Phrase (passphrase)
#usage: wpa_passphrase <ssid> [passphrase]
#If passphrase is left out, it will be read from stdin
#Change directory to the relevant path
cd /etc/wpa_supplicant
#issue the wpa_passphrase command to generate the encrypted
psk passphrase
wpa_passphrase {ESSID} {pass}
#where {ESSID} and {pass} are your Wireless SSID and Passwd,
respectively
```

4. Copy the encrypted key. You'll need this for the next step

5. Modify the wpa supplicant configuration file according to your wireless network configuration

Here is my file:

```
ctrl_interface=DIR=/var/run/wpa_supplicant GROUP=netdev
update_config=1
network={
    ssid="MyNetworkName"
    proto=RSN
    key_mgmt=WPA-PSK
    pairwise=CCMP TKIP
    group=CCMP TKIP
    psk=134b516a855384ea15429da72033ec2725934ed3ff5e3bc2fff64b8ad7
    8c2dfc
}
```

Important: The above psk passphrase was randomly generated! You must change it to match your settings. Also, do not enclose the value in double quotes.

6. Restart your wireless network client

```
sudo wpa_action wlan0 stop
sudo ifup wlan0
#--or--#
sudo wpa_action wlan0 stop && sudo ifup wlan0
```

7. Verify your wireless connectivity

```
iwconfig
#-- or --#
sudo wpa_cli status
#-- or --#
ifconfig
#Optionally, you can query your dhcp lease records file
sudo cat /var/lib/dhcp/dhclient.leases
```

If problems, see the Troubleshooting section

[divider]

Appendix

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Command Cheatsheet

Handy Commands

Command	Description <code>wlan0 essid NETWORK_ID key WIRELESS_KEY</code>	Call the <code>iwconfig</code> command to generate the wireless configuration <code>sudo wpa_action wlan0 stop</code>	Stop the wireless network interface <code>sudo ifup wlan0</code>	Start the wireless network interface <code>sudo wpa_action wlan0 stop && sudo ifup wlan0</code>	Previous two commands, second command runs if first is successful <code>sudo find /somepath -type f -name '*' -executable</code>	Search for executables under the specified folder
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Customizations

1. Enable filesystem check (fsck) after reboot

Because we're working with flash media (SD Cards, etc), I wanted a way to force the Raspberry Pi to check its filesystem after every reboot.

The Raspbian OS will perform a filesystem check if a special file semaphore is present in the root (/) path

```
/forcefsck
```

You can run a one-time fsck on the system simply by creating this file with the touch command, as in:

```
sudo touch /forcefsck
```

To ensure this happens after **every** reboot, you can add this command sequence to the Raspbian OS system startup file:

```
/etc/rc.local
```

```
sudo vi /etc/rc.local
```

Add the below line:

```
/usr/bin/touch /forcefsck
```

Soldering Inputs & Interfaces

The purpose of the P6 header is to enable a reset of the

Raspberry Pi's CPU. The reset switch can restart the system, but it does not provide the safe shutdown

Troubleshooting

```
RELEASE on wlan0 to 10.10.1.1 port 67
1 link set dev wlan0 down
run-parts --verbose /etc/network/if-post-down.d
run-parts: executing /etc/network/if-post-down.d/wireless-tools
run-parts: executing /etc/network/if-post-down.d/wpa_supplicant
wpa_action: removing sendsigs omission pidfile: /run/sendsigs.omit.d/wpa_supplicant.wpa_supplicant
rfkill: Cannot open RFKILL control device
ioctl[SIOCSINAP]: Operation not permitted
ioctl[SIOCSINENCODEEXT]: Invalid argument
ioctl[SIOCSINENCODEEXT]: Invalid argument
ctrl_iface exists and seems to be in use - cannot override it
Delete '/var/run/wpa_supplicant/wlan0' manually if it is not used anymore
Failed to initialize control interface 'DIR=/var/run/wpa_supplicant GROUP=netdev'.
You may have another wpa_supplicant process already running or the file was
left by an unclean termination of wpa_supplicant in which case you will need
to manually remove this file before starting wpa_supplicant again.

2 berrypi /etc/wpa_supplicant $ grep -i handshake /var/log/syslog | tail -20
00:12:23 raspberrypi wpa_supplicant[4303]: wlan0: WPA: 4-Way Handshake failed - pre-shared
0 14 00:12:27 raspberrypi wpa_supplicant[4303]: wlan0: WPA: 4-Way Handshake failed - pre-shared
0 14 00:12:31 raspberrypi wpa_supplicant[4303]: wlan0: WPA: 4-Way Handshake failed - pre-shared
00:12:36 raspberrypi wpa_supplicant[4303]: wlan0: WPA: 4-Way Handshake failed - pre-shared

3 action: ifdown wlan0
/sbin/ifdown: interface wlan0 not configured
wpa_action: removing sendsigs omission pidfile: /run/sendsigs.omit.d/wpa_supplicant.wpa_supplicant
ioctl[SIOCSIWAP]: Operation not permitted
ioctl[SIOCSIWENCODEEXT]: Invalid argument
ioctl[SIOCSIWENCODEEXT]: Invalid argument
ioctl[SIOCSIWAP]: Operation not permitted
wpa_supplicant: /sbin/wpa_supplicant daemon failed to start
run-parts: /etc/network/if-pre-up.d/wpa_supplicant exited with return code 1

wpa_action: ifdown wlan0
/sbin/ifdown: interface wlan0 not configured
wlan0: Trying to associate with c0:4a:00:d0:d2:52 (SSID='etejedaAP01' freq=2422 MHz)
wlan0: Association request to the driver failed
```

1. Search the system log for any errors

```
grep -i handshake /var/log/syslog | tail -20
```

```
Sep 14 00:13:32 raspberrypi wpa_supplicant[4303]: wlan0: WPA: 4-Way Handshake failed - pre-shared key may be incorrect
Sep 14 00:13:36 raspberrypi wpa_supplicant[4303]: wlan0: WPA: 4-Way Handshake failed - pre-shared key may be incorrect
Sep 14 00:13:40 raspberrypi wpa_supplicant[4303]: wlan0: WPA: 4-Way Handshake failed - pre-shared key may be incorrect
Sep 14 00:13:45 raspberrypi wpa_supplicant[4303]: wlan0: WPA: 4-Way Handshake failed - pre-shared key may be incorrect
```

Correct the passphrase

```
sudo rm -f /var/run/wpa_supplicant/wlan0
```

```
sudo rm -f /var/run/wpa_supplicant/wlan0
```

4. Try to manually run the connection command:

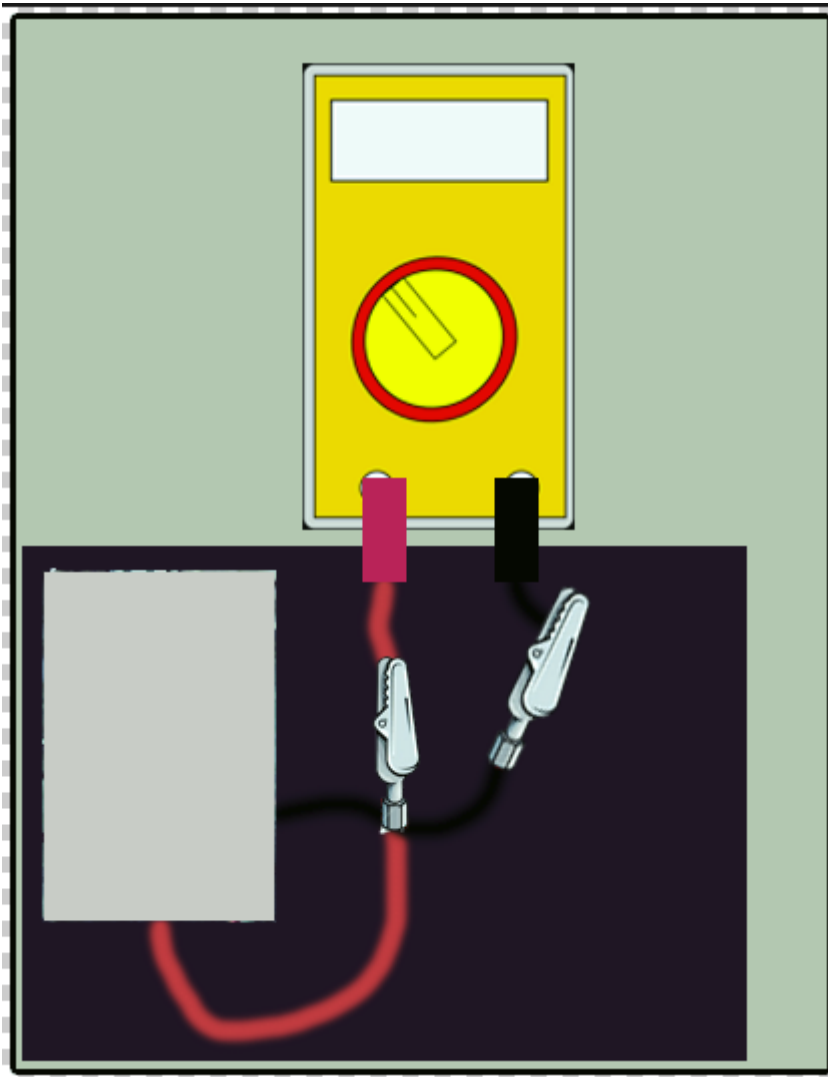
```
sudo /sbin/wpa_supplicant -P /var/run/wpa_supplicant.wlan0.pid -i wlan0 -D nl80211,wext -
```

c/etc/wpa_supplicant/wpa_supplicant.conf

Important Logs:

/var/log/syslog

Multimeter



Sources

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
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Terminology

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