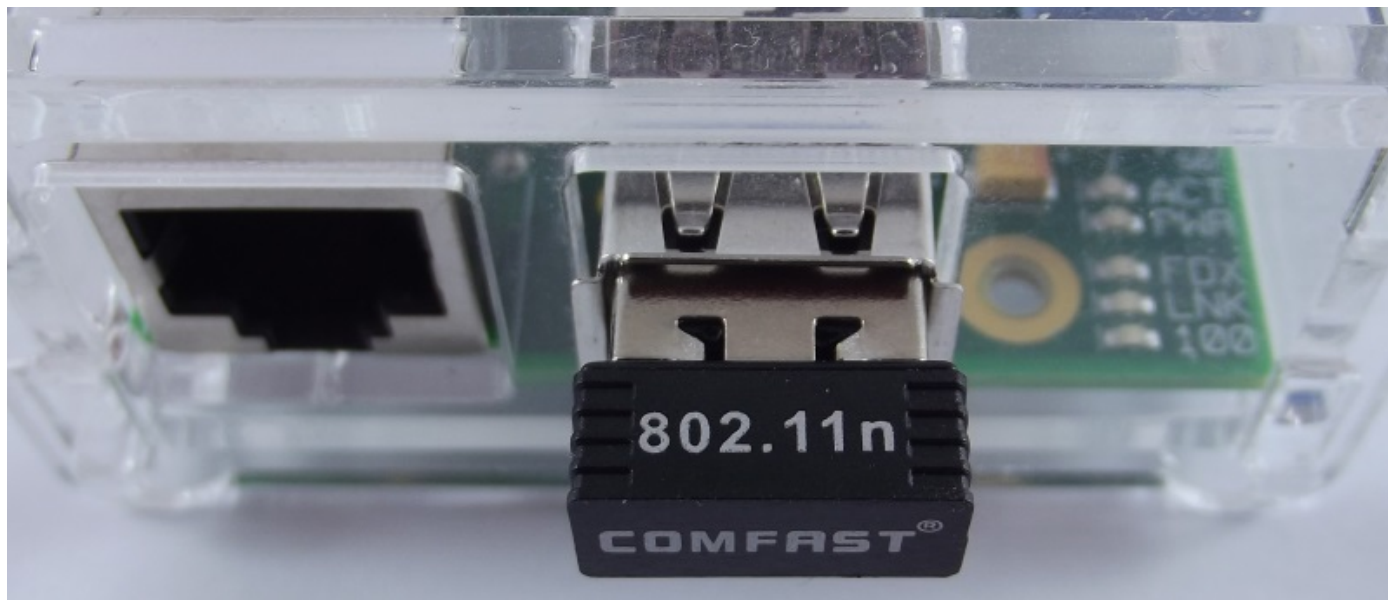


How to set up WiFi on a Raspberry Pi



 **Gary Sims**  27th Jan 2014



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Although the Raspberry Pi Model B comes with built-in 100Mbps wired Ethernet, it can also use WiFi via a USB dongle. The Model A doesn't come with Ethernet at all, so using a WiFi adapter is a good way to get networking on that model. In both cases, simply plugging in a supported USB dongle and doing a simple bit of configuration will give your Pi access to wireless.



infoComm India

2015- AIFA

I-Ctrl, My life "Booth No.
B50/5" Wifi remote control
box



You can get yourself a USB adapter for less than \$10 but it is important to buy one which is supported by the Raspberry Pi and Linux. For this tutorial, I will be using a dongle based on the Realtek RTL8188CUS chipset. The Realtek chipset is supported by Raspbian out-of-the-box and no additional configuration is needed for it to be recognized during boot.

The [RPi USB Wi-Fi Adapters](#) page has a comprehensive list of supported wireless adapters. If you are considering buying a dongle, you should check that page for compatibility.

Plug in the USB adapter and boot your Raspberry Pi. There are several ways to check if the adapter has been recognized. The easiest is to type:

```
ifconfig
```

```
collisions:0  Txqueuelen:0
RX bytes:400 (400.0 B)  TX bytes:400 (400.0 B)
wlan0  Link encap:Ethernet  HWaddr 00:0f:13:96:0a:ee
inet addr:192.168.1.173  Bcast:192.168.1.255  Mask:255.255.255.0
UP BROADCAST MULTICAST  MTU:1500  Metric:1
```

You should see a listing for `eth0` – the built-in wired Ethernet port; for `lo` – the loop back device; and `wlan0` – the wireless adapter.

Alternatively you can list the current USB devices attached to the Pi using:

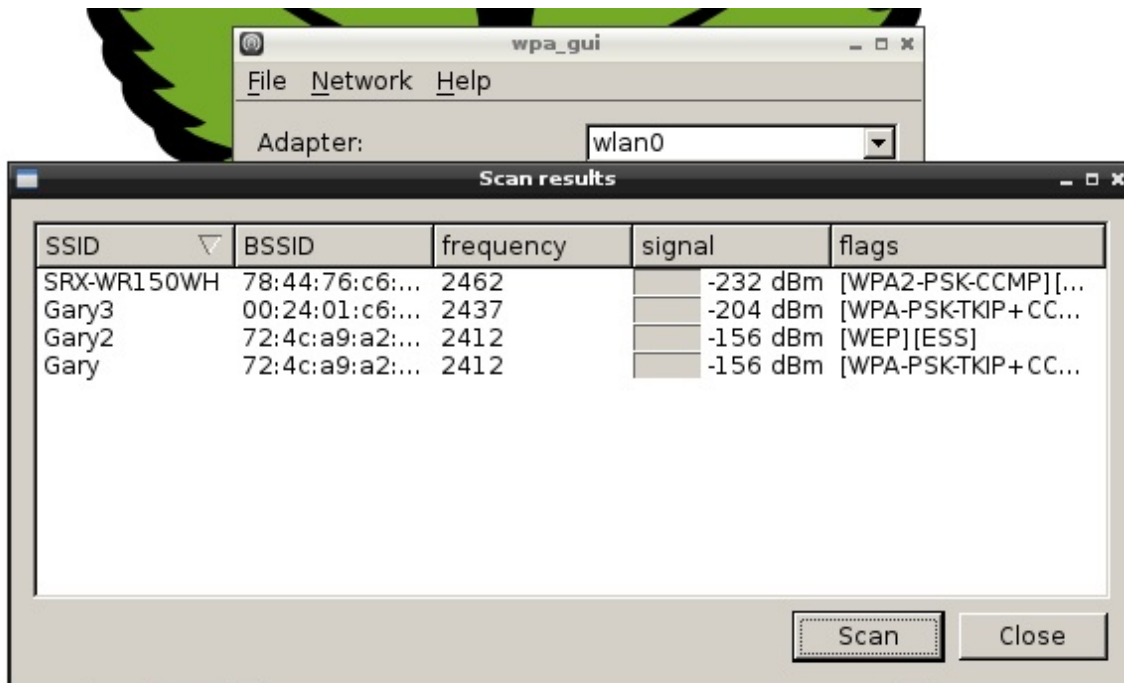
```
sudo lsusb
```

```
$ sudo lsusb
002: ID 0424:9512 Standard Microsystems Corp.
001: ID 1d6b:0002 Linux Foundation 2.0 root hub
003: ID 0424:ec06 Standard Microsystems Corp.
004: ID 0bda:8176 Realtek Semiconductor Corp. RTL8188CUS 802.11n WLAN Adapter
005: ID 058f:9254 Alcor Micro Corp. Hub
006: ID 046d:c05b Logitech, Inc. M-U0004 810-001317 [B110 Optical USB Mouse]
007: ID 1241:1603 Belkin Keyboard
008: ID 13fe:3600 Kingston Technology Company Inc.
```

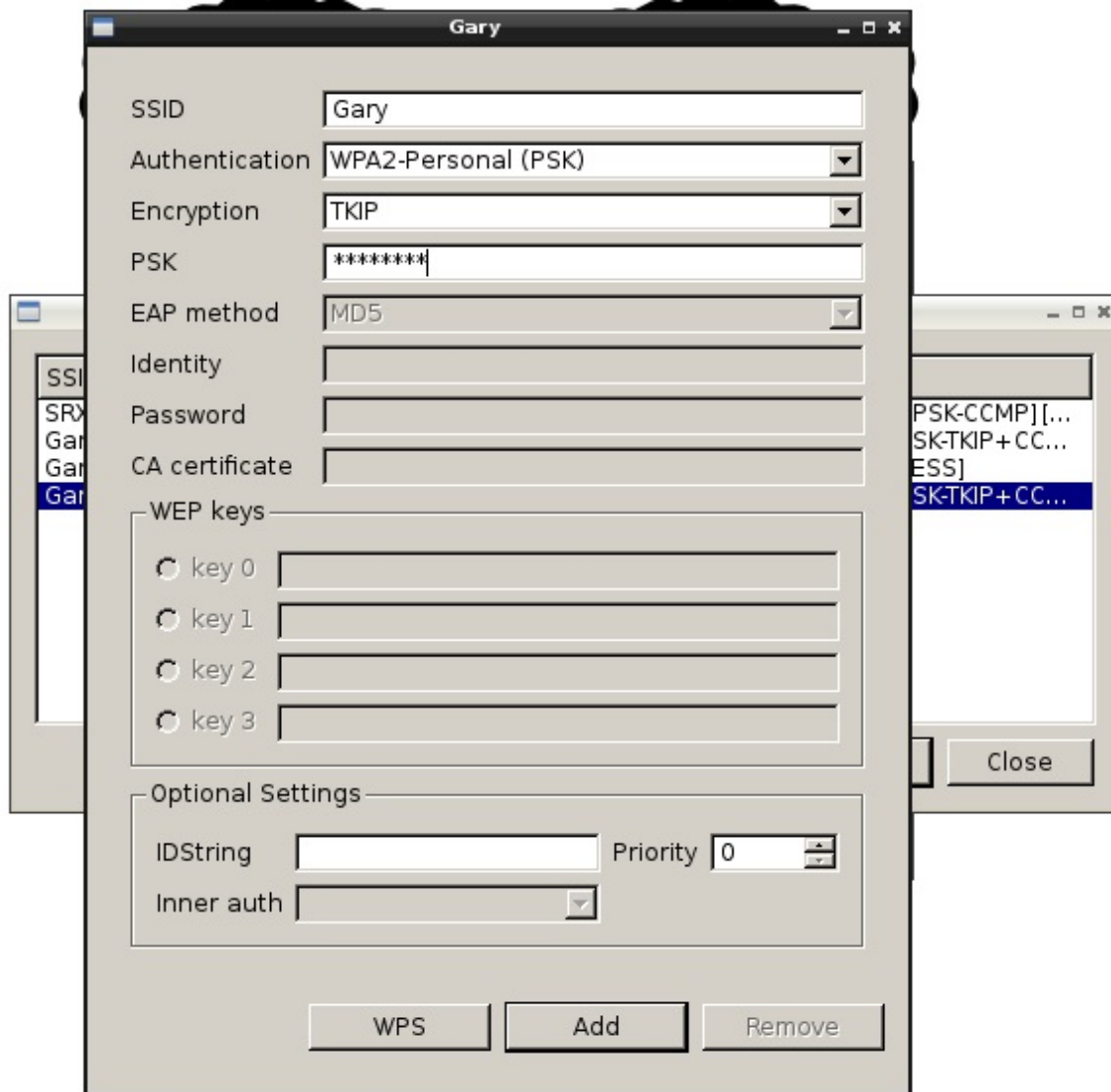
The list should contain your wireless dongle. On my setup, the list shows a “Realtek Semiconductor Corp. RTL8188CUS 802.11n WLAN Adapter”.

Desktop set up

If you are using the desktop on Raspbian than connecting to a wireless network is quite easy. Double click the “WiFi Config” icon on the desktop to start the wireless configuration program. The “Adapter:” field will show your USB dongle (i.e. wlan0) and the “Network:” field will be empty (unless you have previously configured a wireless network). Click the “Scan” button. Now click “Scan” on the “Scan results” window. A list of the available wireless networks will be shown along with their signal strengths etc. To connect to one of the listed networks, double click on the SSID.



On the connection window, verify the "Authentication" and "Encryption" fields and enter the password in the "PSK" field. Now Click "Add". Close the "Scan results" window. The configuration program will automatically connect to the newly configured network.



You can add multiple networks by repeating the same steps. You can select the desired network using the “Network:” drop down list. You can also connect and disconnect using the relevant buttons. You can use the “Managed Networks” tab to edit and remove networks.



If you aren't using the desktop then the WiFi can be configured using the command line. Raspbian should come with all the correct packages pre-installed but if any of the commands or files mentioned below aren't available, then run this command to install them:

```
sudo apt-get install wpasupplicant wireless-tools
```

The general network settings are configured in “/etc/network/interfaces” while the Wi-Fi

details are set in the “/etc/wpa_supplicant/wpa_supplicant.conf” file. First edit the “interfaces” file:

```
sudo nano /etc/network/interfaces
```

Ensure that the section about `wlan0` (typically found at the end of the file) reads as follows:

```
allow-hotplug wlan0
iface wlan0 inet manual
wpa-roam /etc/wpa_supplicant/wpa_supplicant.conf
iface default inet dhcp
```

If there are difference then change them to accordingly. Don't alter any of the lines about the `lo` adapter or the `eth0` adapter. Press “CTRL + X” to exit nano (press Y and then press ENTER when prompted).

To get a list of the currently available wireless networks, use the `iwlist` command:

```
sudo iwlist wlan0 scan
```

If there is too much information, use `grep` to find the fields you need. For example to see just the ESSIDs, use:

```
sudo iwlist wlan0 scan | grep ESSID
```

```
pi@raspberrypi ~ $ sudo iwlist wlan0 scan | grep ESSID
    ESSID:"Gary"
    ESSID:"Gary2"
    ESSID:"Gary3"
    ESSID:"SRX-WR150WH"
```

Pick a network and add the network authentication information in the “wpa_supplicant.conf” file:

```
sudo nano /etc/wpa_supplicant/wpa_supplicant.conf
```

The first two lines should already read:

```
ctrl_interface=DIR=/var/run/wpa_supplicant GROUP=netdev
update_config=1
```

Now add the following:

```
network={
    ssid="YourSSID"
    psk="password"
    key_mgmt=WPA-PSK
}
```

If your **router** is configured using WEP for encryption then the network information will look like this:

```
network={
    ssid="YourSSID"
    wep_key0="password12345"
    key_mgmt=NONE
}
```

For those of you familiar with advanced WiFi configurations, the network information can also include the following fields:

- **proto** – Protocol type can be: RSN (for WPA2) and WPA (for WPA1).
- **pairwise** – CCMP or TKIP (for WPA2 or WPA1).
- **auth_alg** – authentication algorithm, can be OPEN for both WPA1/WPA2 and less commonly SHARED or LEAP.

Press “CTRL + X” to exit nano and save the file, press Y and then press ENTER when prompted. Finally reboot your Pi:

```
sudo reboot
```

You can check the status of the wireless connection using `ifconfig` (to see if `wlan0` has

acquired an IP address) and `iwconfig` to check which network the wireless adapter is using.

```
pi@raspberrypi ~ $ iwconfig
wlan0 IEEE 802.11bgn ESSID:"Gary" Nickname:"<WIFI@REALTEK>"
Mode:Managed Frequency:2.412 GHz Access Point: 72:4C:A9:A2:A0:E8
Bit Rate:135 Mb/s Sensitivity:0/0
Retry:off RTS thr:off Fragment thr:off
Power Management:off
Link Quality=98/100 Signal level=100/100 Noise level=0/100
Rx invalid nwid:0 Rx invalid crypt:0 Rx invalid frag:0
Tx excessive retries:0 Invalid misc:0 Missed beacon:0

lo no wireless extensions.

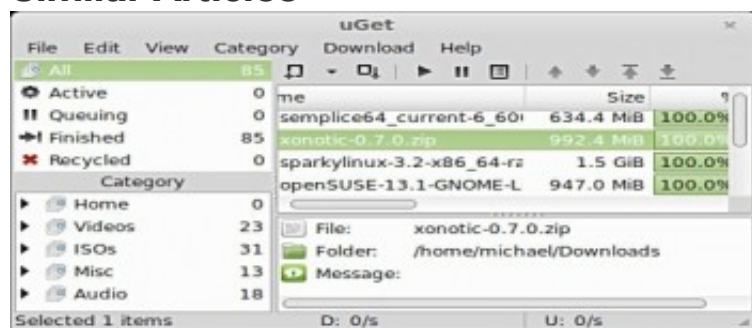
eth0 no wireless extensions.
```

If you have any questions about wireless on the Raspberry Pi, please ask them in the comments and we will see if we can help.

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Anders Jackson

I would recommend you to use the command `ip(8)` instead of `ifconfig(8)` as the last one are deprecated. Same with `arp(8)` and `route(8)`. They are also replaced by the `ip` command.

`ip addr show` – `ifconfig`

`ip route show` – `route`

`ip neigh show` – `arp(8)`

And lots of configuration can be done with `/etc/network/interfaces` together with `wpa-driver` and `wpa-roam` stanza and use `id_str="key"` in `wpa_supplicant.conf` file network config. Please look into manual page `wpa_action(8)` for more information.

But this is a greate start.

Jan 28, 2014 at 10:01 am



Klaus

i can scan my wifi and i see my wlan but ras pi could not get a ip address from my wifi router (dhcp is configured on) when i start the ras pi gui and start wifi network it is empty.

any idea?

cu, Klaus

Jan 14, 2015 at 7:43 am



Andrew

I take my Pi from place to place and would like to store the SSIDs and passwords of more than one network. Would you just repeat the network={...} code in the wpa_supplicant.conf file for each network?

Jan 30, 2014 at 5:27 am



Gary Sims

Andrew, yes that is right, just repeat network={...} section for every network.

Jan 30, 2014 at 7:05 am



Melb

I'll recommend wicd-curses it is painless to change network

Jan 30, 2014 at 1:47 pm



Gary Sims

Melb, thanks for the tip, yes wicd-curses is a good tool for those who don't want to get their hands dirty!

Jan 30, 2014 at 11:20 pm



pixster

why use wpa-roam?

Just block that line and FORGET IT!

Feb 4, 2014 at 10:05 am



bryan

Thanks for this tutorial. I have been struggling to setup my wireless until i found this. You rock man

Apr 19, 2014 at 9:34 am



Chet

Great tutorial. Can I just omit the psk or key lines for ssid's that are open (e. g. Not password protected)

Do I also need to say key_mgmt = none?

Apr 23, 2014 at 7:25 pm



Jon

I was looking for an answer to this as well, and it's looking like if the network has no authentication/plaintext, you omit the psk key and include key_mgmt=NONE, eg.,

```
“  
network={  
ssid="whatever"  
key_mgmt=NONE  
}  
“
```

May 8, 2014 at 6:32 pm



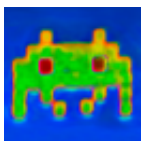
Kaitlyn

Hello

I'm trying to use the desktop setup, but for some reason it isn't working for me. I have the Edimax 150Mbps Wireless 802.11b/g/n nano USB adapter. Once I click scan my router does show up, but when I put in the correct password and try to use the internet, it seems to have not gone through.

Also, when I tried the command line steps that didn't work either. Now, when I go scan to get the list of available wifi routers, nothing shows up.

May 26, 2014 at 3:22 pm



Yomguy

Great howto, thanks!

May 30, 2014 at 5:13 am



Seth

Thank you so much. Everything worked exactly as you described it.

May 31, 2014 at 11:06 pm



Richard

Both files where i use 'nano' are empty??

Jun 9, 2014 at 1:23 pm



Temp

Make sure you typed them correctly, else nano will create these files

Sep 21, 2014 at 4:29 am



Ryan

ensure you use the sudo command. For me, the files came up blank when I had left that out.

Nov 4, 2014 at 2:25 pm



shawn

i am using a model A right here and and WiFi dongle is TL-WN727N from TP-LINK. cant seem to connect to internet at all. When i start up the pi, (/etc/network/interfaces) failed. Any help would be much appreciated. TIA

Jun 16, 2014 at 10:17 pm



Gary Sims

Hi,

I haven't used that Dongle myself but looking here:

[http://www.raspberrypi.org/forums/viewtopic.php?](http://www.raspberrypi.org/forums/viewtopic.php?t=11262&p=272581)

[t=11262&p=272581](http://www.raspberrypi.org/forums/viewtopic.php?t=11262&p=272581) there seems to be people who have had trouble getting it to work. That particular forum post is from 2012, so I don't know if it is still relevant.

Does ifconfig show the wlan0 device???

Gary

Jun 16, 2014 at 10:45 pm



peter

@Shawn: Follow instructions on [(UPDATE) Drivers for TL-WN725N V2 - 3.6.11+ -> 3.12.24+]

Link: <http://www.raspberrypi.org/forums/viewtopic.php?f=28&t=62371>

Jul 14, 2014 at 3:02 am



madness

More than likely because it has a ralink chipset. Try finding a card that has realtek or atheros chips. Chances are they will work out of the box

Dec 10, 2014 at 7:53 am



Note

My network keeps connecting and disconnecting.. What am I doing wrong?

Jul 18, 2014 at 6:18 pm



MBJadhav

Been struggling to get my wi fi dongle up and running but without success (on Raspbian)

Tried several suggestions from different forums
the following is response to the command

```
$ sudo iwlist wlan0 scan
wlan0 Interface doesn't support scanning.
```

other commands and responses

```
$ lsusb
Bus 001 Device 002: ID 0424:9512 Standard Microsystems Corp.
Bus 001 Device 001: ID 1d6b:0002 Linux Foundation 2.0 root hub
Bus 001 Device 003: ID 0424:ec00 Standard Microsystems Corp.
Bus 001 Device 004: ID 0bda:8179 Realtek Semiconductor Corp.
Bus 001 Device 005: ID 0e8f:00a5 GreenAsia Inc.
```

```
$ iwconfig
lo no wireless extensions.
```

```
eth0 no wireless extensions.
```

However ifconfig does give the following:

```
pi@raspberrypi ~ $ ifconfig
eth0 Link encap:Ethernet HWaddr b8:27:eb:d4:88:d2
inet addr:192.168.1.36 Bcast:192.168.1.255 Mask:255.255.255.0
UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1
RX packets:1703 errors:0 dropped:0 overruns:0 frame:0
TX packets:1880 errors:0 dropped:0 overruns:0 carrier:0
collisions:0 txqueuelen:1000
RX bytes:1543727 (1.4 MiB) TX bytes:218299 (213.1 KiB)
```

```
lo Link encap:Local Loopback
inet addr:127.0.0.1 Mask:255.0.0.0
UP LOOPBACK RUNNING MTU:65536 Metric:1
RX packets:2 errors:0 dropped:0 overruns:0 frame:0
TX packets:2 errors:0 dropped:0 overruns:0 carrier:0
collisions:0 txqueuelen:0
RX bytes:276 (276.0 B) TX bytes:276 (276.0 B)
```

Please Note: the same dongle works fine on RASPBMC in fetching add ons , you tube videos etc

Thankx in advance for your time and help....

Jul 20, 2014 at 1:03 pm



Mohan

Hi Jadhav,

I have the sample problem. Were you able to solve this issue? If so, please advice.

Thanks,

Mohan

Aug 24, 2014 at 12:13 pm



mrlaulearning

Like many others, I had trouble with both the WiFi Config and following this guide. In the end, used Wicd-curses

<http://www.raspyfi.com/wi-fi-on-raspberry-pi-a-simple-guide/>

Aug 17, 2014 at 8:11 am

**Thilina**

Thanks a lot. After couple of tries I figured how to. Thanks again for the support.

Aug 19, 2014 at 5:15 am

**alex**

thank you! very clear instructions, it took me just few minutes

Aug 20, 2014 at 12:57 am

**Larry**

I'm using a CanaKit B+ PI with the 150 MBPS USB Wireless Adapter (model CKXW1000). It connects then drops out after 5 seconds, and repeats this process endlessly. Please advise.

Oct 15, 2014 at 7:53 pm

**Simon**

It worked. Very nice explanation. The ability to check the work was the best part. I was able to see that the changes I made at first did not work. A bit of trouble shooting and I found the error. Very nice.

Oct 30, 2014 at 2:01 pm

**Mason**

I'm using a Netgear N300 wireless adapter. It doesn't even show up inside of the ifconfig but it shows up in the lsusb.

Any idea? I've tried both powered usb hub and directly connected. (works on Windows just fine).

Nov 2, 2014 at 3:39 pm



Vicky

I just bought the Adafruit miniature wifi module. The main reason I bought it is to make my raspberry pi wire-free (except the power cable). I don't want to use a separate keyboard, mouse and monitor for the pi, and I always use ssh and vpn to control the pi from my mac. Now this is my question. Is it possible to have the raspberry pi connect automatically to the wireless network upon boot? (I have already assigned a static IP to the pi using its mac address). In other words, I do not want to connect the pi to a monitor and run the wi-fi config every time. I want to just connect the pi to the power, and start controlling it using ssh (assuming the wifi module automatically connects the pi to my network). Is this possible?? Help much appreciated. Thanks!

Nov 19, 2014 at 6:42 pm



Prasanna Hebbar

i guess first you will have to configure pi in wifi mode as per the instructions in this guide. Then you can install vncserver so that you can work in a headless mode.

Nov 22, 2014 at 5:15 am



Prasanna Hebbar

Excellent article. Especially the command to scan the wireless networks using iwlist helped me. I had configured incorrect group-cipher, pairwise cipher and auth-suites. This command helped me get the correct values to be set. Next step

is to configure VNC server so that i can work in a headless mode.

Nov 22, 2014 at 5:13 am



gaurav

when i type-
sudo iwlist wlan0 scan

i get this error-
wlan0 interface doesn't support scanning

Nov 27, 2014 at 10:19 pm



rich

One additional note regarding the WEP configuration in
/etc/epa_supplicant/wpa_supplicant.conf
Add the following line to force the use of wep_key0:

```
wep_tx_keyidx=0
```

Dec 6, 2014 at 12:01 pm



bluef1n

Thanks. This was a great help!

Dec 10, 2014 at 6:15 pm



turbod

I feel dumb. How do you make this → | ?

Dec 20, 2014 at 11:24 am



bonce

Depends on the keyboard layout, but on mine (UK English) it's to the left of the 'Z' key, as a Hold Shift extension to the '\'.
..so yeah, left of 'Z' key is '\', hold shift and press it to get '|'

Dec 27, 2014 at 3:26 am

A

Andy

Can't make any of this work. I'm a total beginner. Help please? Got Wi-Fi adapter to find my Wi-Fi network but doesn't seem to connect to the net.

Help please?

Jan 3, 2015 at 12:47 pm

T

TomK

The dialog box with the add button is off my screen and I cannot resize it so that I can see the add button. Any ideas?

Thank you

Jan 5, 2015 at 5:29 pm

B

Bob

When I list event history from wpa_gui _it shows 4Way handshake failed, pre-shared key may be incorrect. Under STATUS I get: Could not get staus from WPA_SUPPLICANT

Last message signal 15 received.

I am using a RASPERRY PI B1 and 150 Mbps 802.11N/G/B RALINK TECH.
RT5370 Wireless adapter.

ANY HELP WOULD BE APPRECIATED!

Jan 12, 2015 at 9:53 am

Comments are closed.

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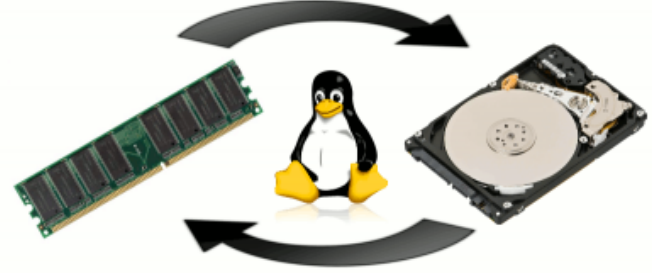
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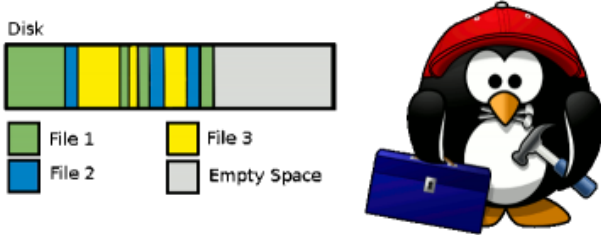
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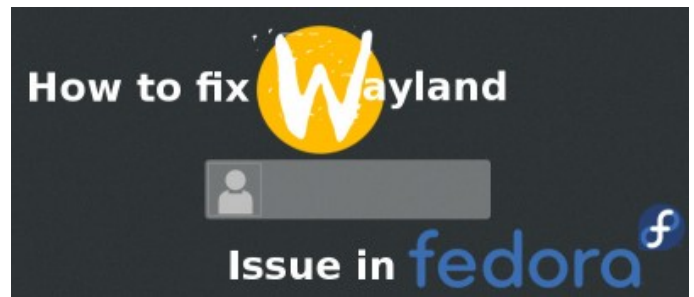
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