

Why your AC wifi can't reach full speed on 3.13 kernel (Ubuntu 14.04, Mint 17, elementaryOS)

Less-known depths of wireless: regulations by countries and non-existent updates for linux.

I've recently bought a new Wifi router, a Linksys WRT1900AC^[1]. Not only for the speed, but also because it was marketed as a hacker-friendly router, with no locks and tricks to replace the firmware with OpenWRT^[2]. (We had to wait for OpenWRT to support the AC speed, but it's all fine now.).

What I was not counting on is the rusty knowledge of mine on wireless. I've set up everything, test, wow, much speed, such 900Mbit/s. Until started fine tuning and added the Regulatory Country Code - and got stuck with 300Mbit/s.

I already knew about the per country limitations (bureaucracy... Vogons...) - what I was unaware of is the fact that this sometimes gets updated^[3] and that the linux you have never updates it on it's own.

kernel 3.13.0-57-generic (which is the thing in Ubuntu 14.04 LTS, Trusty Tahr and also in elementaryOS Freya)

	Ubuntu 14.04	Current online version
Country 00	(2402 - 2472 @ 40)	(2402 - 2472 @ 40)
	(2457 - 2482 @ 40)	(2457 - 2482 @ 40)
	(2474 - 2494 @ 20)	(2474 - 2494 @ 20)
	(5170 - 5250 @ 40)	(5170 - 5250 @ 80)
	(5735 - 5835 @ 40)	(5250 - 5330 @ 80)
		(5490 - 5730 @ 160)
		(5735 - 5835 @ 80)

	Ubuntu 14.04	Current online version
		(57240 - 63720 @ 2160)
country GB:	(2402 - 2482 @ 40)	(2402 - 2482 @ 40)
	(5170 - 5250 @ 40)	(5170 - 5250 @ 80)
	(5250 - 5330 @ 40)	(5250 - 5330 @ 80)
	(5490 - 5710 @ 40)	(5490 - 5710 @ 160)
	(57240 - 65880 @ 2160)	(57000 - 66000 @ 2160)

See the difference? no '@ 80' or '@ 160' for GB in the 3.13 kernel. That is why I was stuck on 300Mbit/s (40Mhz width).

So after a ridiculously long search I've found Rick Deckardt's entry on the topic^[4] which finally helped me solve the issue.

Short story:

```
#!/bin/bash
cd ~
# this is the current version by the time I'm writing this
post;
# go and check the updates before blindly copy-pasting
cur="2015.04.06"
wget "http://kernel.org/pub/software/network/wireless-regdb/
wireless-regdb- $\{cur\}$ .tar.xz"
tar xJf "wireless-regdb- $\{cur\}$ .tar.xz"
cd "wireless-regdb- $\{cur\}$ "
make
sudo cp regulatory.bin /lib/crda/regulatory.bin
sudo cp *.pem /lib/crda/pubkeys
sudo reboot
```

Read more:

- http://www.cisco.com/c/en/us/products/collateral/wireless/aironet-3600-series/white_paper_c11-713103.html
- <https://wireless.wiki.kernel.org/en/developers/Regulatory>
- <https://forum.openwrt.org/viewtopic.php?id=41392>

Links

1. <http://www.linksys.com/us/p/P-WRT1900AC/>
2. <http://wiki.openwrt.org/toh/linksys/wrt1900ac>
3. <http://drvbp1.linux-foundation.org/~mcgrof/rel-html/wireless-regdb/>
4. <http://deckardt.nl/blog/2011/01/20/regulatory-limitations-in-linux-wireless/>

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