

HP Pavillion x2 detachable and Gentoo



Tug Williams June 2023

Old Windows machine

- Bought 10 years ago as Windows 8
 - 2Gb RAM, 32 Gb of internal SD disk
 - 32 bit efi, 32 bit Win8, 64 bit CPU
 - Quad core Intel Atom Z3736F 1.33GHz
 - Wifi only
 - Touch screen, detachable keyboard / stand
 - Tablet / laptop crossover.

Old Windows machine

- Too slow to be useful to original owner
- Insufficient hardware for 64 bit Windows OS
- Kept it as a windows machine
 - Reliable access to help maintain parental machine (teamviewer)
 - But, can't install some 64 bit only tools (zim desktop wiki)
 - Do one thing, and do it only, or memory problems
 - Very limited disk space.
 - Good for watching videos from USB stick.

Install Gentoo

- Away for a long weekend
 - Zim won't run on 32 bit OS,
 - Forgot document to work on anyway.
 - Always have my ventoy stick
- Plan B – install Gentoo

Install Gentoo

- Boot from ventoy
 - Mint and Gentoo 64 bit minimal livecd worked
 - Wiped internal Windows 8
 - Installed Gentoo stage 3 onto internal disk
 - Chroot... discovered wifi VERY unreliable (driver crashes)
 - Workaround (unload / load kernel module, restart wifi)
 - PC eventually hangs.
 - Not up long enough for enjoyable progress.

Good things I learned

- I can install bootable 64 bit OS with 32 bit efi
 - Disabled secure boot
 - Selected f2fs instead of ext4 (opinions?)
 - Use UUID in fstab, as internal and sd cards name keep switching (mmcblk1 and 2, in random order)
 - Set GRUB_PLATFORMS="efi-32"

dracut

- “Generic initramfs generation tool”
 - <https://dracut.wiki.kernel.org>
- Initramfs must include drivers required to mount root disk.
- dracut from inside chroot to build initramfs
 - Mount /boot after chroot (or was that grub-install?)
 - Explicitly specify kernel. Default dracut was using live OS.
 - Initramfs became 20Mb vs original 8Mb, but that’s fine...
 - Loads quickly enough
 - More importantly boots

resolve-march-native

- “Resolve GCC flag -march=native”
 - <https://github.com/hartwork/resolve-march-native>
- “-march=native” compile flag only works if you compile locally
- If doing distributed builds, it must be explicitly defined.
- To find what to replace “native” with -

```
$ resolve-march-native
```

```
-march=silvermont -maes --param=l1-cache-line-size=64 --  
param=l1-cache-size=24 --param=l2-cache-size=1024
```


cpuid2cpuflags

- “Tool to guess CPU_FLAGS_* flags for the host”
 - <https://github.com/projg2/cpuid2cpuflags/>
- To inform compiler what CPU_FLAGS are supported (guessed??), so compiler can make use of it for.

```
$ cpuid2cpuflags
```

```
CPU_FLAGS_X86: aes mmx mmxext pclmul popcnt rdrand sse  
sse2 sse3 sse4_1 sse4_2 ssse3
```

dmidecode

- DMI (Desktop Management Interface) table related utilities
 - <https://www.nongnu.org/dmidecode/>
- `dmidecode | grep SKU`
- SKU Number: K3Q45UA#ABL
- Search internet turns up “HP Pavilion x2 – 10-k010ca”
- <https://support.hp.com/us-en/product/hp-pavilion-10-k000-x2-detachable-pc/7439381/model/7468027/document/c04475656>

RTL 8723 bs

- Appropriately named “bs”
- Ventoy live Mint had same problem
 - wifi works for a bit
 - hangs, can be restarted

```
rmmod r8723bs
modprobe r8723bs
/etc/init.d/net.wlan0 restart
```
- Assumption – leaks as eventually kills machine.
 - Re-boot, re-chroot, and continue...
- Cannot use distcc (distributed compiler) to build gentoo, as wifi dies.

RTL 8723 bs

- Same symptom reported since 2017.
- John suggested I use a usb wifi stick
 - (blush) – of course!
 - Removes irritation, for now. Gentoo is fun again!
- driver=rtl8723bs
- Version 6.1.28-gentoo-x86_64 (so not old)
- Q: Why is driver called “rtl8723bs”, but file is “r8723bs”?

Fixing driver...?

- I'm using recent kernel, so not the problem
 - Or maybe it's a newly introduced bug?
- RTL8723BS: ERROR sd_recv_rxfifo: alloc recvbuf FAIL!
- Some patches out there from 2017, but
 - “A possible fix might look like the following (however, this is only my testing hot-fix to make the driver work and I have to admit that I do not fully understand the whole thing - that's why I am not posting a patch at this point)”
- <https://lkml.org/lkml/2017/6/12/504>

Fixing driver... ?

- Can't 'debug' module
 - I assume a break point in the kernel is a bad idea.
 - I don't know the code at all.
- I can add additional logging, but fail point already logged.
- If it were a simple fix, why not fixed in the last decade?
 - No-one cares about the old hardware?
 - Situation complicated?
 - How much would I need to understand about wifi drivers?
- Is the problem in the bin firmware loaded?
 - Why does it seem fine under windows8?
 - 64/32 bit OS issue?

For now something zippiier than Win8

- As of time of writing, still building the basics I want
 - lightweight gui (icewm)
 - Useful tools (zim / libre office)
 - Use my re-discovered Wacom bamboo (xournal++, gimp)
 - Weekend away entertainment (smplayer / vlc)
 - Online fun (firefox / skype / alpine / x2go)
 - Some development tools? but with 2Gb of ram, maybe not.
 - Some system stuff (touch screen, brightness control, accelerated graphics, gui keyboard)
- A convenient “in my backpack” gentoo tablet!

The End



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Suggestions from meeting chat

- Add log commands to driver with printk
- <https://en.wikipedia.org/wiki/NDISwrapper>
- There is a new driver in staging: <https://wireless.wiki.kernel.org/en/users/drivers/rtl819x>
- r8723bs is a SDIO/SPI driver for RTL8723A/B devices. It's going to be replaced by rtl8xxxu
- Try denylisting the driver, and see if a better one is found.
- Try the driver with a 32-bit Linux
- alloc failure normally implies a heap problem, you might try a heap trace
- Try an older version of fedora