Linux on Laptops: ASUS Zephyrus G14 with Ryzen 9 4900HS

Enlarge / This lede image is a bit of a spoiler—but Linux fans might not want to rush out and buy a Zephyrus G14 just yet.
Jim Salter

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The Zephyrus G14 is a dual-GPU gaming laptop, and Linux tends not to fare well with that setup. But it's the only Ryzen 4000 equipped laptop I have available—so it was obviously going to get Linux on it, whether it liked it or not.

Since brand-new hardware generally calls for brand-new distro versions, I grabbed a fresh copy of the Ubuntu Focal Fossa beta and gave it a whirl. I have the sad duty of reporting that the results were mediocre at best.

Installation

- Oh look! An Ubuntu animation splash under the ROG logo! This is going great! (No it isn't.)
  Jim Salter
- Trying the installer again, this time in Safe Graphics mode, produced much better results. We're installing Ubuntu!
  Jim Salter

- 10 PRINT “NOUVEAU ERROR” 20 GOTO 10
  Jim Salter

The first step in installation on a new laptop is everybody’s favorite game: which key do I press to get to BIOS? It took a couple tries, but on the Zephyrus G14, the correct answer is Esc. Pressing escape gets you to a boot selection menu, with an additional option to go into the BIOS/UEFI setup.

I already knew from my earlier experience with the Dragonfly G1 that using proprietary drivers and tainted kernels meant Secure Boot shenanigans. The Zephyrus G1 offers the ability to enroll a new key—but unlike the Dragonfly, it also allows you to disable Secure Boot entirely. This is just a test laptop, and there are only so many hours in the day, so I disabled Secure Boot rather than monkeying around with MOK keys.

With that done, and the USB drive selected as boot device, things looked good—I chose “Install Ubuntu” from the initial text mode menu. The screen cleared, and hey—an Ubuntu progress splashed underneath the Republic of Gamers logo! We’re on our way!

Five minutes of fans in leafblower mode later, the animation splash stopped moving entirely. Experimentally trying Ctrl Alt F2 to pull a different TTY didn’t accomplish anything, so I long-pressed the power button to turn the laptop off.

On the second try, I chose “Install Ubuntu (safe graphics mode).” This went much better, and I nexted my way through an Ubuntu install, joining my Wi-Fi network successfully along the way. “Maybe this won’t be so bad,” I thought. Unfortunately, on first boot, I got a blank, black screen. But this time, pressing Ctrl Alt F2 got me a working text-mode TTY, and I could log in successfully.

While poking around the system, the problem reached out and smacked me in the face: nouveau, the open source Nvidia

driver, began dumping kernel errors to console faster than they could be printed.

Now I knew what the issue was—but the console spam prevented me from accomplishing anything, so I rebooted again.

After rebooting, I pulled a console on TTY2 again and created a new file /etc/modprobe.d/blacklist-nvidia-nouveau.conf:

```
me@zephyrus:~$ cat /etc/modprobe.d/blacklist-nvidia-nouveau.conf
blacklist nouveau
options nouveau modeset=0
```

Creating this file forces the system not to load the nouveau driver, even though it sees a device it thinks could use it. With nouveau blacklisted, I rebooted again—and this time, I got a graphical desktop.

Configuration

- When the cursor is in that exact spot on boot, you don't even have to touch the mouse to know it's dead.
- I stole the Threadripper's mouse, and used it to install the proprietary Nvidia drivers.
  Jim Salter
- Wait, what?! After installing the Nvidia drivers, the touchpad worked… once. It didn't work again next time I rebooted.
  Jim Salter

Unfortunately, while the desktop worked, the touchpad did not. That bulk you see looming off to the right of these pictures is my open-air rig, with the Threadripper 3970x on it… and it has a wireless mouse, so I stole it. Problem solved! With a working mouse, the next step was opening up the Additional Drivers applet and installing the proprietary Nvidia drivers.

Oddly, the Additional Drivers applet informed me that the

Intel AX200 Wi-Fi 6 device wasn’t working—despite the fact that I was already connected to and busily moving data across a Wi-Fi network. I ignored its complaints about the Wi-Fi and rebooted.

After rebooting, the first thing I noticed was that the touchpad mysteriously started working. The Mouse applet showed the touchpad as enabled and had all options available—tap to click, two finger scroll, edge scroll, and so forth.

I gave the Threadripper its mouse back and opened up Additional Drivers once again. It was still complaining about the perfectly functional Wi-Fi not working; but it also confirmed that the proprietary Nvidia drivers were loaded and functional.

At this point, I rebooted to take a look at some of the options in the laptop’s BIOS menu. I didn’t change anything—but when I got back to the desktop, the touchpad no longer worked. So, I stole the Threadripper’s mouse again. The touchpad never did work again, across several more hours and several reboots of testing. *C’est la vie, c’est la guerre.*

GPU Testing

- It’s not a good sign when the GPU benchmark says your GPU has “N/A MB” on board.
  Jim Salter
- Surprise, surprise. No video RAM detected == no benchmark running.
  Jim Salter
- With benchmarking out, I downloaded a copy of *DOTA2*. At maybe 2FPS, I wasn’t even on the Radeon, let alone the RTX 2060!
  Jim Salter
- I downloaded Vulkan support for *DOTA2*, and tried starting with Vulkan mode forced. Nope.

Jim Salter

So far, things hadn't been *too* bad. The fans spun up quite a bit more often than they had in Windows, which didn't bode well for battery life. On the other hand, maybe extra-spinny fans meant we were really running on the RTX 2060!

The only way I could be truly certain was to fire up a GPU benchmark. Luckily, Superposition—the same benchmark I used on this laptop under Windows—supports Linux as well. Unfortunately, before even running the benchmark, I noticed it was reporting that the GPU had "N/A MB" of RAM. Unsurprisingly, it crashed when I tried to run the benchmark anyway.

With Superposition down for the count, I downloaded a free-to-play game instead. First, I installed Steam, then *DOTA2*. Full confession: I don't know the first thing about *DOTA2*. However, I don't think two frames per second is normal on the menu, before even launching a match.

I enjoy pain, so I tried starting a match anyway—and it rendered in seconds per frame, not the other way around. The game apparently wasn't even running on the Radeon, let alone the RTX 2060—that smells like pure software emulation from here, and even the mighty Ryzen 9 4900HS wasn't up to the task.

Trying—and failing—to make a GPU work

There are two possible methods of switching hybrid GPUs under Linux that I know of—vga_switcheroo, and bumblebee. You need an Optimus video card for bumblebee, and a hardware mux for vga_switcheroo. But vga_switcheroo also requires the open source nouveau driver, not the proprietary Nvidia driver—and the machine wouldn't even run until I blacklisted nouveau.

That left me with bumblebee—more specifically, bumblebee-nvidia, which is supposed to work with the proprietary Nvidia driver I was running. The RTX 2060 Mobile isn't on nvidia's list of Optimus-supported GPUs, but I tried it anyway. Nope—bbswitch complained device not found when I tried to load the kernel module.

Just for grins, I tried downloading *DOTA*'s Vulkan support and running the game from the commandline using steam steam://rungameid/570 -vulkan. No dice there either. Gaming is, at least for now, less possible on this gaming laptop than it would be on the typical $300 Walmart special.

Battery testing

Enlarge / I don’t have a shiny battery life benchmark for Linux—so I open up the BBC’s Ten Hours of Relaxing Oceanscapes video on YouTube in fullscreen.

I was pretty sure I wasn’t going to like the Zephyrus G14’s battery life under Linux, because the fans were spinning a lot harder and more frequently than they had been under Windows. But who knows, I could get surprised, right? So I fired up the BBC’s wonderful 10 Hours of Relaxing Oceanscapes clip on YouTube, noted the time, and let ‘er rip for an hour and some change while I put the kids to bed.

After the last kid was in bed, I went back downstairs to check—44-percent battery capacity, 1:04 remaining. So this is basically a two-hour laptop under Linux, if you don’t ask it to do anything more demanding than watch video clips. I’ve seen *worse*, of course—but it’s a far cry from the nine and a half hours I pulled on the same laptop, running Modern Office battery testing under Windows.

BIOS / UEFI screens

- Zephyrus G14 BIOS—Main.
  Jim Salter
- Zephyrus G14 BIOS—Advanced.
  Jim Salter
- Zephyrus G14 BIOS—Boot Options.
  Jim Salter
- Zephyrus BIOS—Security options.
  Jim Salter
- Zephyrus BIOS—Save and exit.
  Jim Salter

I know some of y’all will want to see all the possible BIOS/UEFI configuration options, to make sure I didn’t miss something. Here you go—this is everything but the “Basic” screen, which is much shinier looking but literally doesn’t let you change a single thing.

Incidentally, while this looks like one of those really shiny BIOS/UEFI graphical interfaces where you can click on things with the mouse—it isn't.

To save a few of you the hassle of reading screenshots, the options boil down to messing with SATA and NVMe configs, enabling or disabling Secure Boot and/or enrolling custom MOK keys to it, and… that's about it, really.

I didn't find any settings to control the behavior of the GPUs—so if you had dreamed of disabling one here and having the other work properly on the desktop, it would appear that you're out of luck.

Conclusions

It looks like the Zephyrus G14 is a bust under Linux, at least for now. It might be possible to get it working better than I did here, but it'll take a considerable amount of work, at the very least.

Get used to fan noise. A lot of fan noise. While the fans mostly only kicked into high gear for gaming under Windows, under Linux they just get feisty for no apparent reason. If you haven't read our Windows review of this laptop, they're quite loud, even for a gaming laptop.

It wasn't too much trouble to get the G14 to boot Ubuntu 20.04, or to get it mostly functional. But with a touchpad that only works occasionally, no support for either GPU, and only a couple of hours on-battery while watching videos, for now it's not much more than a curiosity.

The only bright spot in this dark and dismal painting is the Ryzen 9 4900HS itself. I didn't do any real CPU benchmarking—but bumblebee is a DKMS module, so I got to see how the 4900HS handled compiling it from source. I initially thought the kernel headers weren't installed, and it hadn't

compiled the module at all—but they were, and it did. The CPU is just that beefy.

Full disclosure—this was my first attempt to wrestle a dual-GPU laptop into submission, so I may have missed some tricks. If you spot something that I should have tried but didn't, please pipe up in the comments.

The good

- You can get a desktop working without *much* hassle
- Sound works fine, and video works well enough for full-screen 1080P YouTube
- Say it with me: Ryzen 9 4900HS

The bad

- No working GPU acceleration, on *either* GPU
- Intermittently working touchpad
- Two- to two-and-a-half-hour video-watching battery life

The ugly

- ~2FPS on the *DOTA2 menu*
- Having to blacklist nouveau to get a desktop at all
- Additional Drivers reporting the AX200 Wi-Fi 6 as broken, even though it was connected
- *WHOOOOOOOOSH*

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