A Straight Path to the FreeBSD Desktop

BY VERMADEN

So, you want to try a FreeBSD desktop? Well, maybe you should think again because even people who write and modify FreeBSD daily — FreeBSD developers — used Macbooks for years rather than trying to run a FreeBSD desktop. If that's the case, then why should you try it?

After many years of transition from 4.4BSD and 386BSD to FreeBSD, it remains UNIX at heart and does things a UNIX way. Simple things remain simple and complicated things remain as simple as possible. It's still X11-based and uses traditional plain text files for configuration. Some people actually prefer that — especially after `systemd(1)` from the Linux world. But FreeBSD is a lot simpler and more coherent and it also has several subsystems or features that you will not find in the Linux world. For example, ZFS Boot Environments or GEOM storage framework. There are also Jails, the Base System concept, a great audio subsystem mixed directly in kernel, and many more.

In this article I will try to straighten your path to a FreeBSD desktop.

Hardware

Hardware is the most important part. Really. I have made this mistake more than once. I got hardware that was not supported by FreeBSD. I really wanted the 'most powerful' Intel X3000 graphics card that was packed with Intel G965 based motherboards. I wanted to pair that with the very powerful (back then) Intel Core 2 Quad Q6600 CPU. Unfortunately, FreeBSD did not support that GPU. It supported ALL OTHER Intel GPUs like GMA 950 or GMA 3000, but not that one. That one decision forced me to the Ubuntu Linux world for about a year, and that was not a very happy year as you can probably imagine.

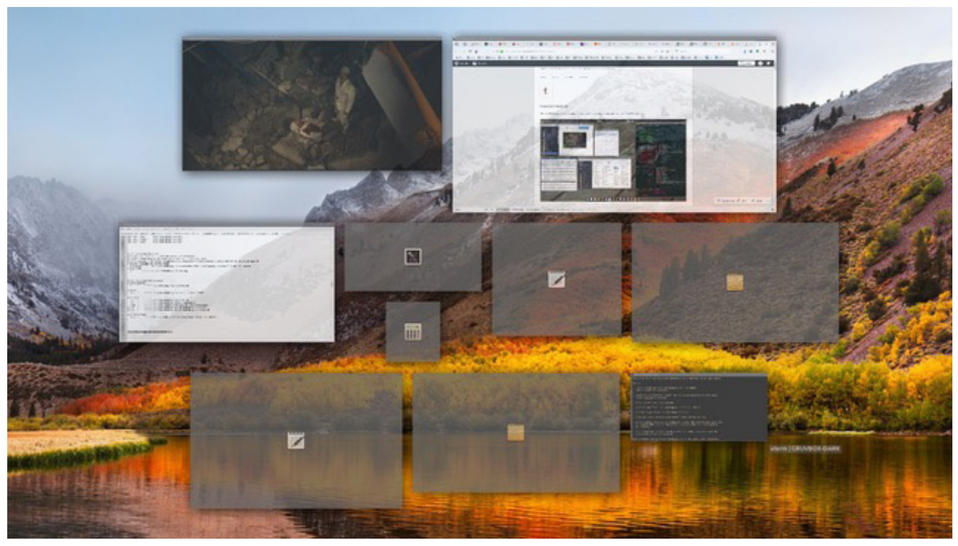
The first rule of thumb with FreeBSD hardware is to NOT get the latest things. To play it safe, look for things that have been on the market for at least two years. That way, you will minimize the chance of ending up with something that's not supported. You should also refer to Hardware Notes for the latest editions of FreeBSD. At the time of this writing, that would include 12.2-RELEASE and 13.0-RELEASE. Here they are:

- https://www.freebsd.org/releases/13.0R/hardware/
- https://www.freebsd.org/releases/12.2R/hardware/

Keep in mind that they are also not perfect. For example, they list many AMD CPUs as supported while they fail to mention AMD EPYC, server CPUs, and AMD Ryzen desktop/mobile CPUs when FreeBSD works on them flawlessly.

Laptops

A lot of people prefer 'mobile computing' instead of classic PC. Generally, IBM and Lenovo ThinkPad laptops are quite well supported by FreeBSD. I prefer the classic 7-row IBM keyboard, so I use a 2011 (yes, a decade old computer) ThinkPad W520 on which everything works beautifully. Others with that classic keyboard are X220/T420/T420s/T520. But you do not need to go back in time that far. For example, ThinkPad X1 Carbon Generation 5th and 6th work reliably. ThinkPad X460/X470/T460/T470 are also ok. There is whole list of laptops tested under FreeBSD with helpful notes, and there is also a BSD Hardware Database. I encourage you to check both before spending your money.



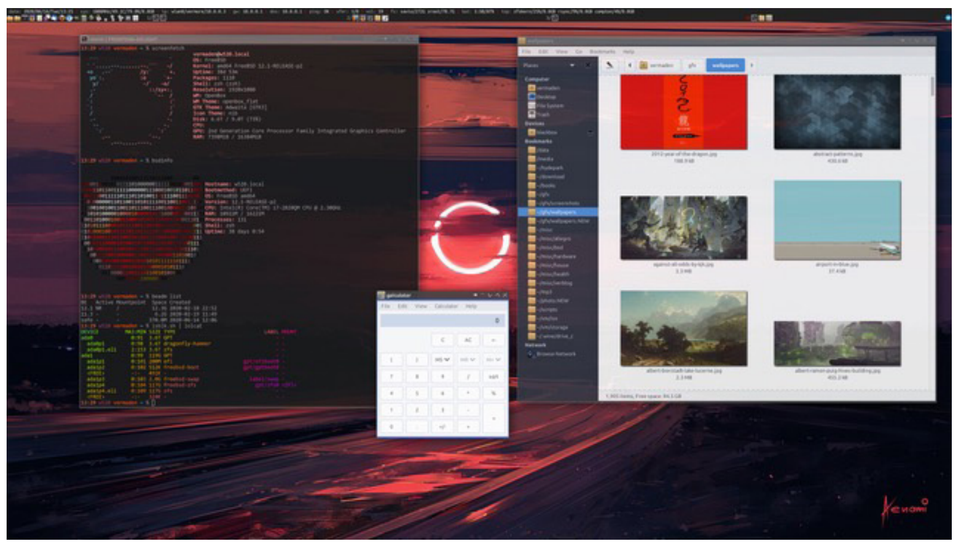
- https://wiki.freebsd.org/Laptops
- http://bsd-hardware.info/

WiFi

This is the part that requires the most rework and improvement in FreeBSD land, but on many fronts, it is already happening. The topic was discussed at the latest FreeBSD Developer Summit, and the FreeBSD Foundation had already noticed that problem and started an initiative to address it. Currently, it's safe to bet on 802.11n chips--as most work, but some only in 802.11g mode (slower). One such chip is Realtek RTL8188CUS, which is really a 'temporary workaround' when you find that the WiFi chip in your laptop is not supported. It's a tiny USB 802.11n WiFi adapter that sticks out several millimeters from the USB-A port. The downside is that FreeBSD only supports it in 802.11g mode, but it still does the job.

GPU

The GPUs that work well under FreeBSD fall into three categories: Intel or AMD GPUs that are supported by open-source drivers; Nvidia GPUs that are well supported by an Nvidia binary driver without any open-source code; ultra-old or too-new GPUs that are just not supported at all. Personally, I use low-power integrated Intel cards and they work well for me, but if you seek more power, then you will have to look at AMD or Nvidia products. I would prefer AMD solutions, as their drivers and designs are open-source, but a Nvidia closed binary driver also works well for many.



Bluetooth

Personally, I see Bluetooth more as a mobile phone thing then a laptop thing, but Bluetooth is present in all laptops and even in many SBCs like Raspberry Pi. Bluetooth on FreeBSD for a mouse or keyboard should work, but it can also 'kill' your suspend/resume cycle on some laptops.

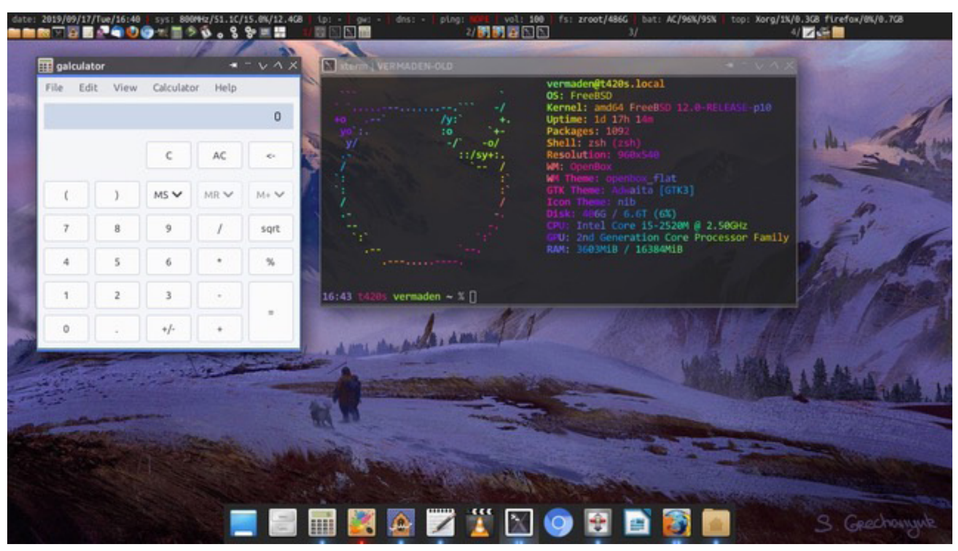
BIOS Settings

Sometimes you need to change several BIOS settings to make your laptop properly suspend/resume. The things that sometimes need to be disabled are:

- Bluetooth
- Trusted Platform Module (TPM)

X11

It does not matter if you select FreeBSD 12.2 or 13.0 — both do good job on the desktop. For Intel and AMD GPUs, you will need `graphics/drm-fbsd12.0-kmod` or `graphics/drm-fbsd13-kmod` respectively. For the Nvidia GPU, you will use the appropriate x11/nvidia-driver version instead, as there are several so check which one is best for your GPU in the Nvidia Release Notes for FreeBSD. As for X11 itself, one can use either `x11/xorg` or `x11/xorg-minimal`. Use the latter one if you wany the smallest possible number of installed packages. In a way, that is pointless, because when you start to install GTK/QT desktop software, you will end up with about 1,000 packages anyway and about 10 GB of used space.

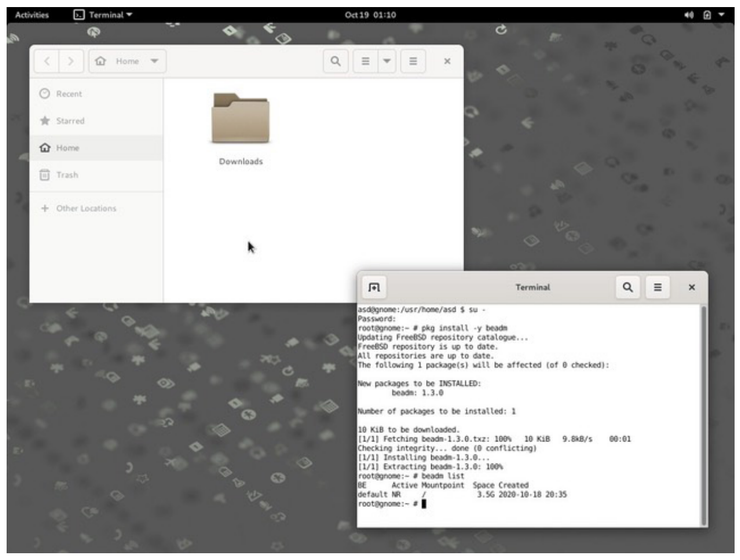


Do not forget that FreeBSD has lots of documentation on X11 — in the Handbook and FAQs:

- https://freebsd.org/handbook/x11
- https://freebsd.org/faq/#X11

Graphical Environment

Choosing a graphical environment is up to you and and there are many to choose from. Some people prefer minimalistic Openbox or the FVWM stacking window manager. Others prefer tiling window managers such as i3 or Awesome. Some choose light environments like MATE or XFCE. Others find fully fledged desktop environments like GNOME or KDE the most comfortable. If you stick to a more minimalistic window manager approach, you will need to create your own environment with your own status bar and information bar. Decide if you want a notification daemon or not and whether to use your system tray and clipboard manager or not at all — with desktop environments these decisions are made for you. You do not have to reinvent the wheel again :)



Ready Solutions

You may install FreeBSD and set it up to create your own desktop your own way, but if you just want to see how it feels to use a FreeBSD desktop, then you may try one of the several ready to use FreeBSD desktop-oriented solutions. I will add a short summary of each of them here - more insight is available at the FreeBSD Foundation page — https://freebsdfoundation.org/freebsd-project/resources/guide-to-freebsd-desktop-distributions/.

GhostBSD

It's probably one of the older and more mature ones. It uses MATE as its graphical desktop. It also uses the OpenRC init system instead of the default rc(8) FreeBSD one. That may be attractive to some Linux users who already know the OpenRC system. They also have an XFCE variant if you find that attractive. Check https://www.ghostbsd.org/.

NomadBSD

This one focuses on Openbox with small additions for very light desktop. It also uses Tint2 and Plank and it is similar to a MacOS layout. It has several interesting DSB tools for auto-mounting or sound volume control. Their page is https://nomadbsd.org/ address.

helloSystem

The helloSystem is still in very early development but has some unique features not even available on Linux like a global menu search/filtering system. Its graphical part is written mostly in QT. Check the details at https://hellosystem.github.io/docs/.

Closing Thoughts

I chose the 'create-my-own-desktop' path and built my graphical environment with Openbox as the window manager — described in 26 parts in my FreeBSD Desktop series — https://vermaden.wordpress.com/freebsd-desktop/. You should also check the FreeBSD Foundation summary on the X11 setup — https://freebsdfoundation.org/freebsd-project/resources/installing-a-desktop-environment-on-freebsd/.You may also use the desktop-installer to do lot of that work for you — https://www.grayhatfreelancing.com/freebsd-desktop-workstation-quick-build/.

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