Overclock your AMD Ryzen Mobile on Linux with Ryzen Controller

Written by M.Hanny Sabbagh
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Overclocking is the process of changing the default clock speed of a computer's component (CPU, RAM..) into a higher one in order to get a better performance in the PC equipped with it. It's a very common thing do among gamers. It can be sometimes dangerous on the computer if you adjust the clock speeds too high, and it may physically damage your computer, but if you know what you are doing, you'll get a better performance in most cases without breaking the red line.

There's more to it than just changing the clock speeds of CPU and RAM: You can also for example change the maximum temperature a CPU can reach before it drops the performance down in order to save the physical condition of the CPU, or the maximum/minimum amounts of virtual RAM (VRAM) or the power (Watts, mA, V) that's being supplied to various components in your computer. If you do those things correctly, you'll get a better performance on your computer.

In order to do that on an AMD Ryzen Mobile CPU, you'll need a special program for the task. Here comes Ryzen Controller, which is a relatively new graphical program that works on both Windows and Linux that allows you to adjust various settings related to many components in your computer. We'll learn together how to install it on Linux.

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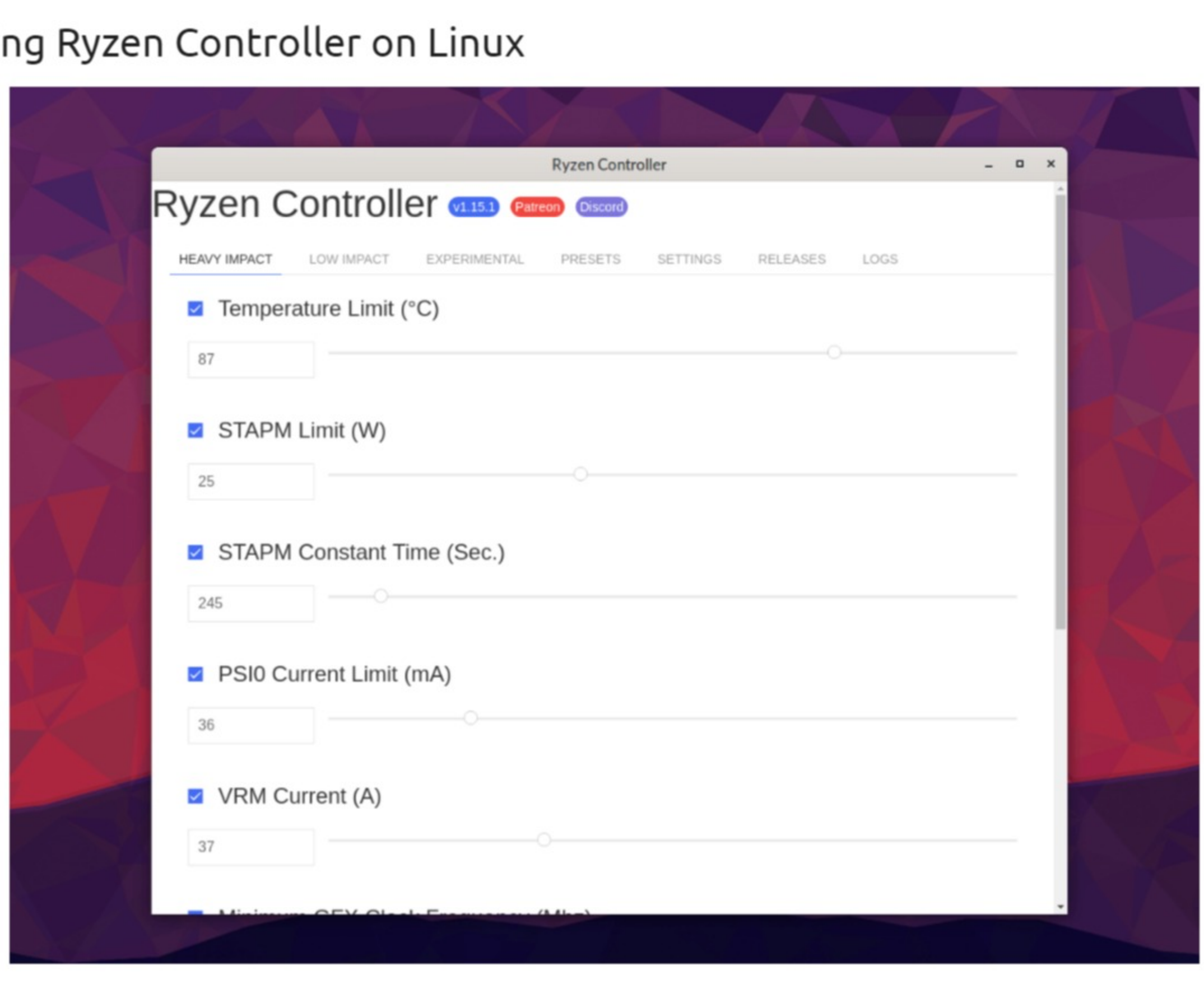


Installing RyzenAdj

Ryzen Controller depends on a special command line utility called RyzenAdj, which is actually the main core program responsible for overclocking/adjusting the power settings of your PC's components. You'll need to compile RyzenAdj from source on your Linux distribution before you proceed further.

Don't be scared: The compilation process is quite easy and quick. On Debian/Ubuntu based distributions, you'll need to run the following command to install some build dependencies:

```
sudo apt-get install libpci-dev cmake gcc git
```

On Fedora:

```
sudo dnf install libpciaccess-devel git
```

For other distributions, just make sure that the development package related to `libpci` is installed.

Now, we can go ahead and compile our RyzenAdj:

```
git clone https://github.com/FlyGoat/RyzenAdj
cd RyzenAdj
mkdir build && cd build
cmake ..
make
```

If the build process was completed successfully, you should see both the `ryzenadj` and `libryzenadj.so` files under `RyzenAdj/build/` folder. Just keep them there for now.

Also from FOSS Post: 5 Tips for Better Gaming Performance on Linux

Installing Ryzen Controller

Now we can go ahead with installing Ryzen Controller. Just head to the releases page of the program and download the latest package corresponding to your distribution's package format and install it.

On Debian-based distros, it would be:

```
sudo dpkg -i <path_to_downloaded_deb_file>
```

On Fedora-based distributions, it would be:

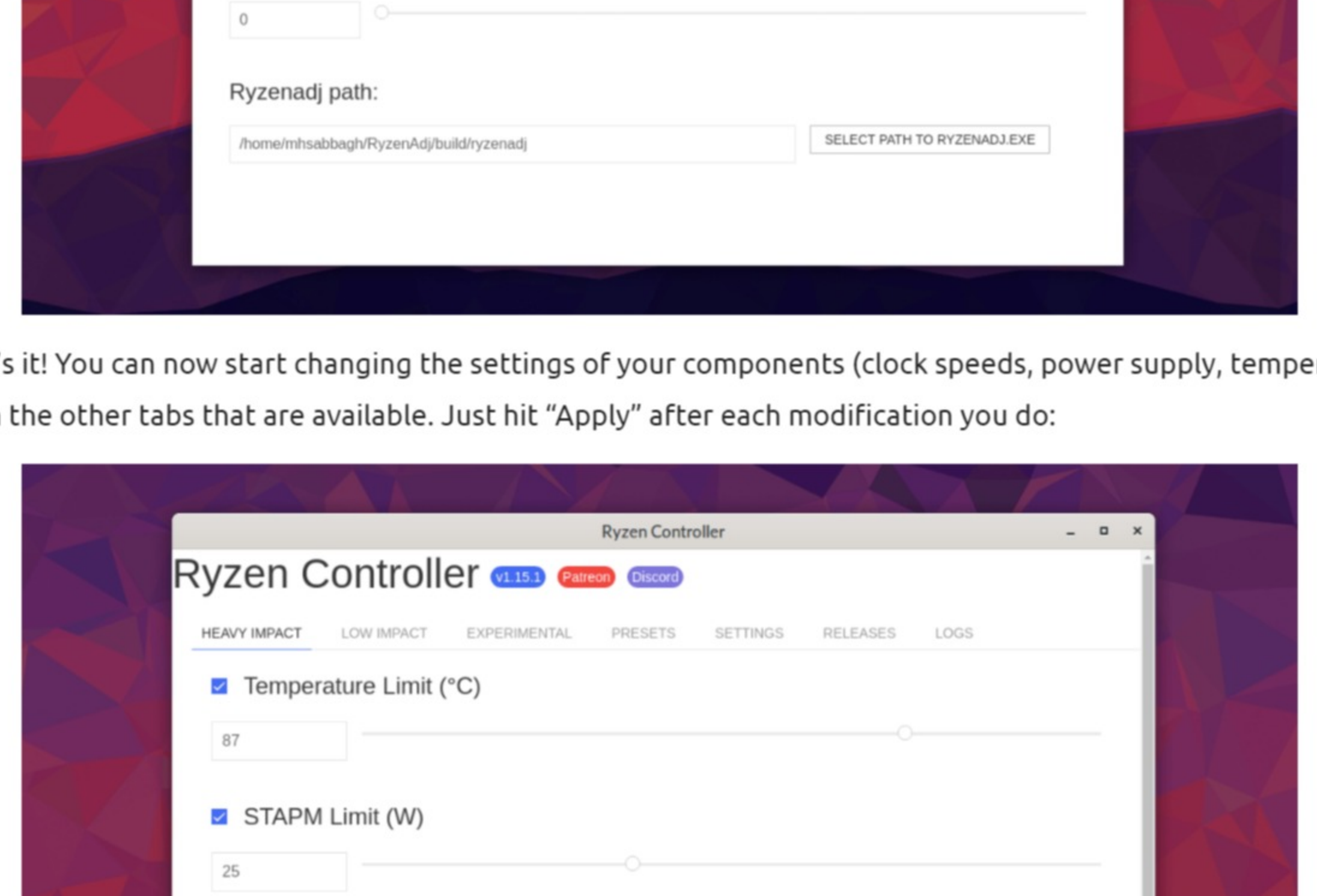
```
sudo rpm -ivh <path_to_downloaded_rpm_file>
```

From my testing, it seems that there's a bug preventing from launching the program from the application menu. So in order to start the program, you'll have to write the following command in the terminal:

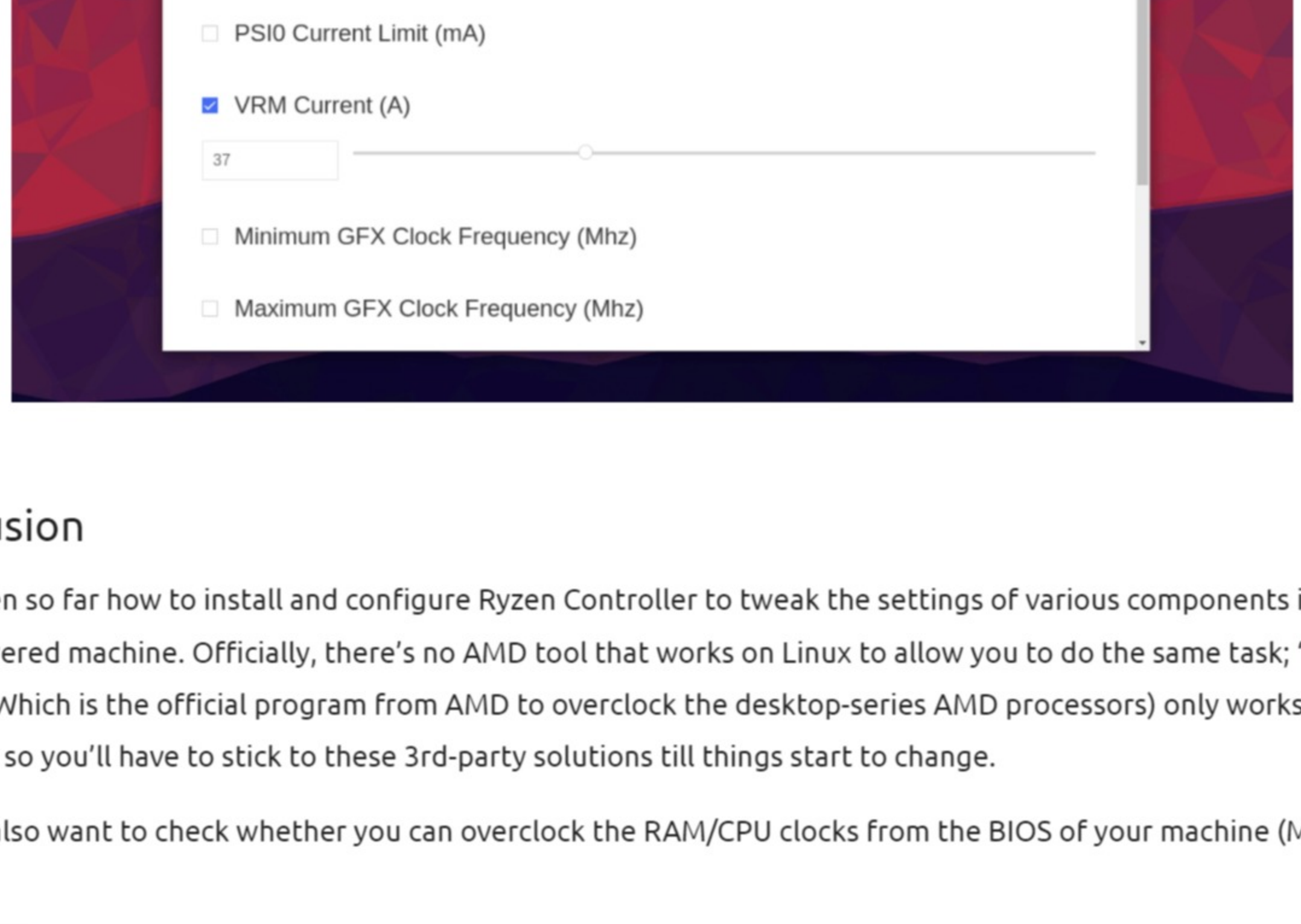
```
sudo ryzencontroller --no-sandbox
```

Tweaking the Settings

After you installed the program, you now need to tell it the full path to the previous `ryzenadj` binary that we built in a previous step. Just head to the `Settings` tab, and under `RyzenAdj Path`, choose the path of the `ryzenadj` file:



And that's it! You can now start changing the settings of your components (clock speeds, power supply, temperature.. etc) from the other tabs that are available. Just hit "Apply" after each modification you do:



Conclusion

We've seen so far how to install and configure Ryzen Controller to tweak the settings of various components in our AMD-powered machine. Officially, there's no AMD tool that works on Linux to allow you to do the same task; "Ryzen Master" (Which is the official program from AMD to overclock the desktop-series AMD processors) only works on Windows, so you'll have to stick to these 3rd-party solutions till things start to change.

You may also want to check whether you can overclock the RAM/CPU clocks from the BIOS of your machine (Most of them do).

Linux Gaming

M.Hanny Sabbagh
Hanny is a computer science & engineering graduate with a master degree, and an open source software developer. He has created a lot of open source programs over the years, and maintains separate online platforms for promoting open source in his local communities.
Hanny is the founder of FOSS Post.

9 COMMENTS

Oldest

Goran
3 years ago

Thanks for the great tips!

I have a HP laptop running 2500u. I've set the power at 25W, VRAM at 40A and temperature limit at 85C.

But I have no idea how to tweak the rest of the settings, like STAPM Constant Time, PSI0 Current Limit, Minimum and Maximum GFX Clock Frequency and those 'Low Impact' and 'Experimental' settings.

Could you please give me a recommendation for these? I would greatly appreciate it!

Cheers!

Reply

M.Hanny Sabbagh Author
Reply to Goran · 3 years ago

I honestly don't know that too, that's why I didn't tweak them 🙂 But for me, the ones mentioned are enough to get around 50-60 fps on the games I play.

Reply

Goran
Reply to M.Hanny Sabbagh · 3 years ago

Ok, thanks! 🙂

Very good I am glad you achieve a high FPS! For some reason, I still don't manage to get it as high as I see some people on YouTube do with the same APU. I am not sure what I am doing wrong lol.

Reply

M.Hanny Sabbagh Author
Reply to Goran · 3 years ago

You'll need to apply it each time your computer awakes from suspension/screen lock for example. So to make sure, just apply the settings again directly before you launch a game.

I am also not getting 'exactly' like what those people are getting, that could be partly because of the screen resolution (My laptop comes with a 1920×1080), so the performance on large screens is going to be less than when on a small screen using the same APU. But RyzenController helps a lot.

Reply

prithvish
Reply to Goran · 2 years ago

u can set online presets….as per my cpu i have selected highest tdp seetings and my fps has increased by 25

Reply

pepe
3 years ago

Can I use this program to undervolt my Ryzen 2500U

Reply

M.Hanny Sabbagh Author
Reply to pepe · 3 years ago

Yes, you can force it to a lower Watts if you want. Though I wouldn't recommend missing with the default settings of you CPU (If you don't want extra performance, then simply leave it as it is and don't use any tweaks or software).

Reply

pepe
Reply to M.Hanny Sabbagh · 3 years ago

Thanks but the idea is not to lower the tdp, in fact increase it and at the same time undervolt the cpu to have better temperatures and better performance

Reply

edgan
2 years ago

keep saying unable to apply ryzenadj

Reply