How to Limit CPU Frequency on Fedora 28

dunterov.github.io/cpu-freq

If you want to limit your laptop's CPU under Fedora Linux, just like me, this small how-to is what you need. What is it for? Well, there's a number of reasons. After limiting CPU frequency I got:

- Better thermal mode
- Decreasing fan noise level
- Increasing time without charging

So let's start.

First thing first - we have to install `cpupower` tool. Under Fedora you can just do

```
sudo dnf install kernel-tools
```

Next let's check what governons are available:

```
cpupower frequency-info --governors
```

If the output is something like this:

```
analyzing CPU 0:
  available cpufreq governors: powersave performance
```

then we have to do some magic with intel pstate driver As you can see in the documentation, this driver provides an interface to control the P-State selection for the SandyBridge+ Intel processors.

So we need to do the following:

```
sudo vi /etc/default/grub
```

And add option `intel_pstate=disable` to `GRUB_CMDLINE_LINUX`. In my case the file's content is like:

```
GRUB_TIMEOUT=5
GRUB_DISTRIBUTOR="$(sed 's, release .*$,,g' /etc/system-release)"
GRUB_DEFAULT=saved
GRUB_DISABLE_SUBMENU=true
GRUB_TERMINAL_OUTPUT="console"
GRUB_CMDLINE_LINUX="rhgb quiet intel_pstate=disable"
GRUB_DISABLE_RECOVERY="true"
```

After that we shoul update grub configuration and reboot.

```
sudo grub2-mkconfig -o /boot/grub2/grub.cfg
sudo reboot
```

After reboot check available governons again

```
cpupower frequency-info --governors
analyzing CPU 0:
  available cpufreq governors: conservative userspace powersave ondemand performance
schedutil
```

Much better!

So now we can do anything with our CPU frequency!

Check options:

```
sudo cpupower --cpu all frequency-set
At least one parameter out of -f/--freq, -d/--min, -u/--max, and
-g/--governor must be passed
```

Try to do something like this (but remember, that numbers depend on your CPU configuration. This example is suitable for my Lenovo X230):

```
sudo cpupower --cpu all frequency-set --max 2.0GHz
sudo cpupower --cpu all frequency-info
```

And you should see something like this:

```
<...>
  current policy: frequency should be within 1.20 GHz and 2.00 GHz.
                  The governor "ondemand" may decide which speed to use
                  within this range.
<...>
```

Double check which governon is in use:

```
cat /sys/devices/system/cpu/cpu0/cpufreq/scaling_governor
ondemand
```

Well, seems good. Now you can play around with parameters to find the most suitable config for you.

That’s all. Stay tuned.

Written on May 20, 2018