How to optimize Linux on Asus E200HA

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Abstract

The present guide aims at providing general guidelines for the optimization of Linux distros on Asus E200HA. It is not an easy task, since this netbook has not a Linux-friendly hardware (Intel Cherrytrail... looking at you!), yet it can be a decent machine for school/university purposes. You can expect a relevant improvement in system performance and much more available disk space compared to Windows 10. Everythig I learned in six months of daily usage will be listed in this document. Feel free to share these pieces of information, contact me via GitHub and ask for improvements. Enjoy!

Contents

1 Which distro?

This guide is not about hey-this-distro-is-absolutely-the-best-ever: bull***ts. There is no perfect distro, especially for this kind of laptop! It has a modest hardware, but with the right distro you can deal with it quite well. Moreover, the hardware is not Linux freindly at all... this is the most tricky part and this is what this guide is about.

The most relevant part of a distro, as far as we talk about Asus E200HA performance, is the Desktop Environment. In my opinion, for this netbook you should stick to XFCE, LXDE and MATE. If you have more time to spend configuring your desktop and you are already experienced with Linux, Openbox and i3wm are both good options.

I list here some of the suggested distros for new users or intermediate Linux users that don't want to spend so much time reading posts in forums/blogs trying to find the best option for their netbook. I wrote them in random order, choose what you like most or try something different! The only limitation I see is the Desktop Environment.

1.1 Suggested distros

- **Manjaro XFCE**. Lightweight and intuitive thanks to XFCE. Always updated thanks to the rolling Arch-based repos. For this kind of laptop, updated kernel may mean a better support for Intel processor, while a lightweight DE is necessary to guarantee good performance. The only drawback is the little but very friendly community. If you come from Ubuntu-based distro, you have to expect less unofficial documentation, but you can always ask for help in its community.
- **Other Manjaro flavors**. Manjaro comes with many flavors suppoerted by its great community. In this very moment, I am writing from Manjaro i3wm Community Edition. It is great, lightweight and fast... but it is not for every user, especially if you are new to Linux. Anyway, check out Manjaro flavors, some lightweight options may be interesting.
- **Lubuntu 18.04** and **Xubuntu 18.04 LTS** are the best options for new users approaching Liinux. Especially Xubuntu featuring XFCE is easy to manage, easy to customize and familiar to those coming from a Windows experience. Lubuntu is similar, slightly lighter but with less applications and functionalities out-of-the-box, since it relies on LXDE. IMHO, Xubuntu is great thanks to its stability and LTS support!

2 Hardware configuration

2.1 Wifi setup

Wifi should be recognized out-of-the-box, but you need to enable third-party apps and non-free drivers when you install your Linux distro. In case you are

unsure about wifi support, try your distro from a live usb!

- Ubuntu and flavors. The recommended version is 18.04 or above, since proprietary wifi drivers were quite buggy in previous LTS 16.04, and totally absent in 14.04. Enable third-party app download during installation.
- Manjaro Linux. Enable non-free driver when using you live distro and during installation. From Manjaro 17.x, wifi is recongized out-of-the-box.

2.1.1 Audio [EXPERIMENTAL]

2.1.2 eMMC Storage

To increase performance and prolong flash memory lifespan, it is suggested to modify the following line of the configuration file */etc/fstab*. For every Linux partition, add at the fourth column the options *discard,noatime*. For instance, the fourth column of the root partition should be like:

```
errors=remount-ro 0
```

It must be changed in:

```
discart,noatime,errors=remount-ro 0
```

2.1.3 Multi-monitor configurations

Asus E200HA has a very small monitor, very interesting for working on a train/bus or taking notes during lectures and conferences, yet it might me useful to configure a second monitor for home working.

- I personally tried to configure an external display connecting it to the micr-HDMI port on **Lubuntu 18.04** and **Xubuntu 18.04** and it worked perfectly out-of-the-box. Display settings GUI integrated in Ubuntu is alway a good tool to customize you multi-monitor experience without any line of code.
- On **Manjaro** Linux 17.x the second monitor must be configured. In case you need to do so, there is a simple GUI tool colled arandr that is the easiest way to do so. It is compatible with any Linux distro... just look for *arandr* package and install it. Then run it from your app menu or from command line (just type *arandr*). A simple user interface will allow you to update the list of available monitor and decide which is the primary monitor, which is the position of the secondary monitor, etc..

Manual configuration tips In case you have set you multi-monitor confiugration with arandr, please remember to save you config file and use it whwnever you want. You must open the file and run the lines of code inside it. Multimonitor configuration will be applied.

You can also configure the system to run your custom multi-monitor settings startup. I assume you have already saved the arandr configuration file with tour preferred options inside it. You can open this config file with a text editor. You will read one or more lines of code with arandr configurations. Copy all the lines. Paste all those lines at the end of the text file named *.xinitrc* in your home directory. If not present, create it. Than reboot and check that the new configuration is correctly loaded.

3 Software optimization

3.0.1 Improve battery life

On every Linux laptop, I seggest TLP for power management: it helps lowering CPU temperature, preventing hardware damage and extending battery life. To install it on Ubuntu-based distro:

```
sudo apt-get install tlp tlp-rdw
```

To launch TLP with default settings:

```
sudo tlp start
```

TLP installation on Manjaro and other Arch distros:

```
sudo pacman -S tlp
```

TLP configuration for Manjaro and Arch (with deafult settings):

```
systemctl enable tlp
systemctl enable tlp-sleep.service
```

In case you want to customize TLP settings, I suggest you to read carefully its documentation HERE.

3.0.2 Remove screen tearing using Compton

As I wrote when talking about suggested distros for this netbook, XFCE is a rocksolid and fast DE. My warm suggestion for ASUS E200HA is ussing an XFCE distro (Linux Mint XFCE, Xubuntu, Manjaro) and take care of an issue that may arise: **screen tearing**.

Tearing on nVidia and Intel graphic cards can be tricky to solve as it depends both on the hardware you have and the software you are using. On XFCE I found out that default desktop compositor has not alway the same graphic performance. Tearing when scrolling web pages and watching video is often an issues. The solution I suggest is replacing XFCE default compositor with **Compton**, a lightweight compositor that guarantees good performance even on low-specs machines.

Compton is suggested also for LXDE and MATE desktop environments if you experience screen-tearing issues. Compton has a config file that must be

optimized for you hardware/software. Installing and confiugring it is a matter of a few minutes, if you know what to do. If you don't, please follow the instruction contained in **my GitHub repo** (Please click HERE). You will find a sample config file that you can copy-paste in your XFCE distro and the instruction to make Compton you default compositor at startup. I tested it on Xubuntu 16.04, Xubuntu 18.04 (and equivalent Linux Mint XFCE versions), Manjaro 16.x and Manjaro 17.x. In every case I obtained the complete removal of tearing and a general improvement in terms of UI experience.

3.0.3 Disable hybernation and suspension

At the moment of writing (December 2018) suspension and hybernation are not supported on Intel Cherrytrail devices. They might be supported in a near futere, or using up to date Linux kernels, yet it could be unstable (freezing/crashing while suspending). It is wise to disable any kind of accidental suspension.

On Debian/Ubuntu distros, disable suspension with the command:

```
sudo systemctl mask sleep.target suspend.target hibernate.target hybrid-sleep.target
```

On any Linux distro, you can prevent you netbook from suspending when closing the lid adding the followind lines to */etc/systemd/logind.conf*:

```
[Login]
HandleLidSwitch=ignore
HandleLidSwitchDocked=ignore
```

When you close the lid, suspension will not happen, but your netbook will consume very little power. This is a good option also for battery saving purposes, even though for long periods (many hours, a few days...) I suggest to simply shut down your machine.

Finally, if you get the following error message during boot:

```
Gave up waiting for suspend/resume device
```

You can solve the problem by adding *noresume* to your kernel parameters in */etc/default/grub*. So, your kernel boot parameters line should look like:

```
GRUB_CMDLINE_LINUX_DEFAULT="quiet noresume"
```