Installing Linux on an Ultrabook

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1 Introduction

This presention is a rambling about my experiences while getting a distribution of Linux working to my satisfaction on a modern laptop computer (*i.e.* an ultrabook). There are three divisions

- The definition of an Ultrabook.
- What is a Linux distribution and what went into my selection of one.
- Some details of installing Linux on an Ultrabook.

2 An Ultrabook

From Wikipedia:

> Ultrabook is a specification and trademarked brand by Intel for a class of high-end subnotebooks which are designed to feature reduced bulk without compromising battery life. They use low-power Intel Core processors, solid-state drives, and unibody chassis to help meet these criteria. Due to their limited size, they typically omit common laptop features such as optical disc drives and Ethernet ports.

The exact specifications evolve.

The Asus Zenbook UX31A

Partial specifications of my Asus Zenbook UX31A are

Memory	DDR3 1600 MHz SDRAM, 4 GB, OnBoard Memory
Display	13.3" 16:9 HD+ (1600x900)/IPS FHD (1920x1080)
Graphics	Integrated Intel HD Graphics 4000
Storage	SATA III SSD 256GB
Weight	2.86 lbs
Keyboard	286mm frameless illuminated chiclet keyboard

3 Linux Distributions

A Linux distribution is an operating system consisting of a collection of software based around the Linux kernel. There is usually a package management system, a choice of desktop systems, and a collection of application programs. Linux distributions are available for a wide variety of systems, from embedded devices and personal computers up to the powerful supercomputers with specialized functionalities, or down to small embedded systems. For a synopsis of ten of the more popular desktop distributions, take a look at the major distributions page on the Distrowatch web site.

Desktops

Desktops determine what your screen looks like, provide a collection of application software, and provide a means to navigate to your programs and other files on the system. Prominent desktops include

- Gnome
- KDE
- Xfce

For a comparison of these and other desktops, go to How to Choose the Best Linux Desktop for You. Most distributions allow one to chose from several desktops.

My History with Linux

In the early 2000s, I tried a few Linux distributions but various difficulties stopped me from adopting one. Then in 2005, I found Ubuntu — it was wonderful. I used Ubuntu, applying updates as they appeared, into 2010. Then Ubuntu announced changes not to my liking. I stuck with version 10.4 until it would no longer work. I had to find another distribution.

I have not given details about Ubuntu changes. My complaints are similar to those expressed in Why I'm Leaving Ubuntu for Debian

My Present with Linux

The Debian distribution, with some tweaks, in conjunction the Gnome classic desktop gives me a user interface very similar to the original Ubuntu interface I liked so much. This is what I currently use.

Debian is idealistic in its philosophy. Basically, everything should be free and open. Unfortunately, not everything one needs is free and open. We shall see how Debian deals with this problem.

Debian Social Contract

Debian has a Social Contract. The item headings in the contract are

1. Debian will remain 100% free
2. We will give back to the free software community
3. We will not hide problems
4. Our priorities are our users and free software
5. Works that do not meet our free software standards

Text for Item 5

This is the full text for Item 5 of the social contract:

> We acknowledge that some of our users require the use of works that do not conform to the Debian Free Software Guidelines. We have created "contrib" and "non-free" areas in our archive for these works. The packages in these areas are not part of the Debian system, although they have been configured for use with Debian. We encourage CD manufacturers to read the licenses of the packages in these areas and determine if they can distribute the packages on their CDs. Thus, although non-free works are not a part of Debian, we support their use and provide infrastructure for non-free packages (such as our bug tracking system and mailing lists).

Configuring Debian

Devices on a computer, *e.g.* Ethernet or Bluetooth interfaces, require drivers. Drivers are often proprietary to the companies that produce them. To protect trade secrets, or other reasons, drivers are usually closed software. The remainder of this presentation deals with tweaks required to get Debian working well on the Zenbook UX31A.

4 Configuration

The first step for installing Debian on a computer is to check the DebianOn web site. From there one clicks through the brand and models to their particular computer. For my computer, the final page is UX31A. The only problem indicated is that a non-free driver for the wireless interface is required.

Fixing the wireless problem

The reason one has a laptop is to have a portable computer that can be used without a wired connection. How does one install the OS without wireless? There are two ways to proceed

- Obtain a full version of Debian on a DVD and install from that. Make sure the non-free wireless driver is included.
- Find a wired connection that can be used for the installing the OS and activating the non-free wireless driver.

I used the latter method.

Activating the Wireless Driver

If using the latter method, do a basic install of the OS. Then, from the applications menu, run the Synaptic Package Manager. Install the package `firmware-iwlwifi`.

Other non-free drivers

Though not required for the UX31A, there is a package `firmware-linux-nonfree` that contains a variety of non-free drivers. I think these mainly relate to graphics devices.

The Bluetooth Mouse

I have not become comfortable using a trackpad. Previously I used a USB wireless mouse that required a dongle. I wanted something slicker to use with my new computer, and bought a Logitech Ultrathin Touch Mouse T630. The T630 is a Bluetooth device. It mostly worked — but it had to be resynchronized upon each power-up of the computer.

The Fix

The synchronization problem is well known bug, and a bug report has been filed. In the mean time, one can fix the problem following the Linux hardware guide. The following is an excerpt from the guide.

> To achieve automatic paring, the following lines have to be added to the file /usr/share/gnome-bluetooth/pin-code-database.xml:

```
<!-- Logitech Ultrathin Touch Mouse -->
<device oui="00:1F:20:"
   name="Ultrathin Touch Mouse" pin="0000"/>
```

The Superuser

Unix and Linux have a superuser that has the authority to add and delete user accounts, install software, and other administrative tasks. On desktop computers, the individual that installs the system may become the super user by issuing the command `su`. He returns to being an regular user by issuing the command `exit`. Making a mistake as the superuser can be disastrous to the system. There is another class of users called sudoers that is safer.

Sudo

Sudoers is a group of users that have limited administrative privileges such as changing their own password and installing software. There is a program *sudo* (short for Super-User DO?) which allows users in the sudoers group to run some commands as the superuser. This is more convenient and safer. To add a user to the sudoers, become the superuser, and run the command

```
adduser your-user-name sudo
```

Then log out and log back in. Some distributions automatically put the individual installing the system in the sudoers group. Debian does not. There is a Debian wiki providing more information.

Conclusion

Working all this out took a lot of time and entailed considerable frustration. I hope some of this will be useful for you.

I learned a lot. I have setup with not much bloat. Most of all, it is a comfortable and productive environment for what I do.