

Linux on an Ultra Mobile Laptop

Jes Sorensen, Red Hat
<Jes.Sorensen@redhat.com>

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Agenda

- Scope / background
- Specs
- First boot, rescue, & installing a distro
- Gathering information, hunting down drivers, dealing with vendors
- Conclusions

Scope / background

- Why bother?
 - Full PC, fits in pocket, always on you
 - Ideal alternative to cell phone?
 - Cool gadget
- Discovered in Softmap during JLS2009
 - Playing in store, getting into BIOS, figure out how to boot from ext device....
- Had to buy one :)



Specs

- Intel Atom Z510
1.1GHz
- RAM 512MB
- Screen 4.8",
1024x600,
touch-screen
- GFX GMA-500 /
Poulsbo
- Audio Realtek, mic +
speaker
- Full keyboard (jp)
- Disk 16GB SSD
- Wifi 802.11b/g
libertas SDIO
- Bluetooth 2.0
- microSD slot
- 1.3MP Webcam
- Mini female USB 2.0
(with USB adapter)
- XP in Japanese
- Weight 345g

Specs - missing bits

- USB connectors
- VGA connector/adapter
- UMTS/HSDPA (3G)

First boot/installing

- BIOS in English, phew!
- Boots from USB, not from microSD
- Original disk layout had two partitions XP and rescue partition
- Boot Fedora rescue mode, backup partitions + partition table to USB before deleting
- Install Fedora 12 beta (later back to Fedora 11 due to lack of drivers)

Good, bad, what next?

- It boots!
- X works, but slow (GMA500)
- Audio, Bluetooth works
- Keymap issues (do not use us keymap on a jp keyboard!)
- WiFi no-luck (not in lspci/lshw output and no firmware in Fedora)
- Touch-screen behaves like mouse
- Study lspci + lshw output

lspci

```
[root@micro ~]# lspci
00:00.0 Host bridge: Intel Corporation System Controller Hub (SCH Poulsbo) (rev 07)
00:02.0 VGA compatible controller: Intel Corporation System Controller Hub (SCH Poulsbo)
Graphics Controller (rev 07)
00:1b.0 Audio device: Intel Corporation System Controller Hub (SCH Poulsbo) HD Audio
Controller (rev 07)
00:1d.0 USB Controller: Intel Corporation System Controller Hub (SCH Poulsbo) USB UHCI
#1 (rev 07)
00:1d.1 USB Controller: Intel Corporation System Controller Hub (SCH Poulsbo) USB UHCI
#2 (rev 07)
00:1d.2 USB Controller: Intel Corporation System Controller Hub (SCH Poulsbo) USB UHCI
#3 (rev 07)
00:1d.7 USB Controller: Intel Corporation System Controller Hub (SCH Poulsbo) USB EHCI
#1 (rev 07)
00:1e.0 SD Host controller: Intel Corporation System Controller Hub (SCH Poulsbo) SDIO
Controller #1 (rev 07)
00:1e.1 SD Host controller: Intel Corporation System Controller Hub (SCH Poulsbo) SDIO
Controller #2 (rev 07)
00:1e.2 SD Host controller: Intel Corporation System Controller Hub (SCH Poulsbo) SDIO
Controller #3 (rev 07)
00:1f.0 ISA bridge: Intel Corporation System Controller Hub (SCH Poulsbo) LPC Bridge
(rev 07)
00:1f.1 IDE interface: Intel Corporation System Controller Hub (SCH Poulsbo) IDE
Controller (rev 07)
```

lsusb

```
[root@micro ~]# lsusb  
Bus 004 Device 001: ID 1d6b:0001 Linux Foundation 1.1 root hub  
Bus 003 Device 002: ID 0a12:0001 Cambridge Silicon Radio, Ltd Bluetooth Dongle  
(HCI mode)  
Bus 003 Device 001: ID 1d6b:0001 Linux Foundation 1.1 root hub  
Bus 002 Device 001: ID 1d6b:0001 Linux Foundation 1.1 root hub  
Bus 001 Device 002: ID 0ac8:3430 Z-Star Microelectronics Corp.  
Bus 001 Device 001: ID 1d6b:0002 Linux Foundation 2.0 root hub
```

- Bluetooth + camera - standard devices
- No WiFi shows up to be a Libertas SDIO device
- No touch-screen - ps/2 serial device

Hunt for information

- Now that the system is booting, search for info on the net....
- Similar system sold in Korea under the name UMID M1
- People have had some luck installing
- Particularly useful links listed on 'Resources' slide

Resources

- EETI eGalaxyTouch driver:
<http://210.64.17.162/web20/eGalaxTouchDriver/linuxDriver.htm>
- AdamW's Poulsbo F13 driver repo:
<http://www.happyassassin.net/2010/07/19/poulsbo-gma-500-driver-in-rpm-fusion-repository-for-fedora-13/>
<http://tinyurl.com/2g7fdhx>
- Hawke Robinson SuSE Linux on UMID:
<http://hawketechtalk.com/Members/hawke/umid-mbook-m1-and-suse-linux-11.1>
- Ubuntu on UMID (mostly down)
<http://designer.dlinkddns.com/blog/?p=257>
- Libertas firmware (WiFi)
<http://dev.laptop.org/pub/firmware/libertas/>
- Creating a USB Fedora installer
<http://fedoraproject.org/wiki/FedoraLiveCD/USBHowTo>

Now what....

- Touch-screen driver exists, binary only :(Does work and is essential...
- GMA500 driver for Xorg only for Fedora 11 (and now Fedora 13). Binary only, but can survive without :(
- libertas_sdio is major problem, locks up solid on GET_LOG command, required by network manager. Work-around USB wireless key. TODO
- Suspend/resume 'interesting' at best...

TODO

- Contacted EETI about getting updated eGalaxyTouch driver, but little reply. Taiwan company with own schedule.
- Poulsbo is lost cause from Free Software perspective :(
- Upgrade to Fedora 13 now that new touch drivers are available, maybe try psb driver
- Fix libertas driver

Conclusion

- Cool gadget, size is about right for carrying around, but....
 - Too many bits with binary only drivers
 - SSD is ancient technology and very slow for writes (no TRIM support)
 - 512MB of RAM is on the low side
 - Battery life is not impressive
 - No VGA :(looking for USB-VGA
 - No GSM/UMTS/HSDPA makes it less interesting against devices like the N900

Essential tools

- Laptop with working network support
- USB stick large enough to carry a DVD install image (8GB+)
- USB hub
- USB mouse
- USB WiFi key with stable Linux drivers, supported by your favorite distro out of the box



**Questions
and
discussion?**

Credits / thank you

- Matthew Garrett for providing bootable USB stick for 'in-store' experiments
- Keith Packard for diverting attention of store assistants
- Dan Williams for libertas help
- Various people for supplying UMID data (see resources page)
- Linux Foundation for bringing me to Japan