Wonderful World of Mactel Debian
Technical Meeting, Tokyo Linux Users Group

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Agenda

- Who am I?
- Why Debian on MacBook?
- Installing Debian on MacBook: Debian + Mac OS X dual-boot setup
- Current problems and future directions
Who am I?

Junichi Uekawa 上川 純一
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- Junichi Uekawa 上川 純一
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- Jan 2000, became Debian Developer
- June 2006, bought MacBook
- July 2006, installed Debian on MacBook
What’s new in Debian on MacBook

- New architecture
- Boots with EFI
- Want to play with machine with new architecture!
- Everything is connected via USB, including built-in keyboard, mouse, iSight, IR-remote.
- Intel Core Duo: dual-core CPU
### EFI: a Good News

<table>
<thead>
<tr>
<th>BIOS</th>
<th>EFI</th>
</tr>
</thead>
<tbody>
<tr>
<td>MBR: 4 (basic)</td>
<td>GPT: 128</td>
</tr>
<tr>
<td>Mystery</td>
<td>Reads FAT</td>
</tr>
<tr>
<td>What?</td>
<td>PE32+</td>
</tr>
</tbody>
</table>
EFI: command-line

Allows use of MS-DOS-like command-line
You can enter commands even before boot-loader starts!

EFI> fs0:
EFI fs0:> cd EFI
EFI fs0:\EFI> cd dancer
EFI fs0:\EFI\dancer> cd refit
EFI fs0:\EFI\dancer\refit> dir
refit.efi
EFI fs0:\EFI\debian\refit> refit
dual-booting Mac OS X and Debian

- Buy MacBook
- Process partition from Mac OS X
- Install rEFIt
- Install Debian
- Configuration
Buy MacBook

- Click!
Process partition from Mac OS X

Online resize possible with recent Mac OS X
Mac OS X# sudo diskutil resizevolume disk0s2 20G
Install rEFIt

- run bless on Mac OS X, make rEFIt at boot
- When downloading binary from http://refit.sourceforge.net/
  - Extract files to /efi, or somewhere
  - Run ./enable.sh (It will run bless for you)
- When using Debian refit package
  - copy /usr/lib/refit/ to Mac OS X partition
  - sudo bless --folder [full path to directory with refit.efi] --file [full path to refit.efi]
- rEFIt screen will show after a reboot
Boot sequence

- EFI ROM
- rEFIt
- default boot
- bless
- Mac OS X
- lilo
- Linux Kernel

 EFI ROM
Mac OS X
default boot
bless
rEFIt

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Wonderful World of Mactel Debian
Install Debian

- etch after July 2006 will probably work
- Install partition must be partition 3 or 4.
- Boot loader is lilo, but it won’t work
- parted will create GPT table, but destroy MBR.
- move to command-console with Alt-F2
- synchronise with gptsync command
- return with Alt-F1
- Install lilo to partition
- Linux is now selectable from rEFIt after reboot
MBR vs GPT

Shows up differently even on same disk

**MBR**

Disk /dev/sda: 80.0 GB, 80026361856 bytes
255 heads, 63 sectors/track, 9729 cylinders
Units = cylinders of 16065 * 512 = 8225280 bytes

<table>
<thead>
<tr>
<th>Device</th>
<th>Boot</th>
<th>Start</th>
<th>End</th>
<th>Blocks</th>
<th>Id</th>
<th>System</th>
</tr>
</thead>
<tbody>
<tr>
<td>/dev/sda1</td>
<td>1</td>
<td>26</td>
<td>204819</td>
<td>+</td>
<td>ee</td>
<td>EFI GPT</td>
</tr>
<tr>
<td>/dev/sda2</td>
<td>26</td>
<td>2637</td>
<td>20971520</td>
<td>af</td>
<td>Unknown</td>
<td></td>
</tr>
<tr>
<td>/dev/sda3</td>
<td>*</td>
<td>2637</td>
<td>2758</td>
<td>976563</td>
<td>ef</td>
<td>EFI (FAT-12/16/32)</td>
</tr>
<tr>
<td>/dev/sda4</td>
<td>2758</td>
<td>5190</td>
<td>19531250</td>
<td>+</td>
<td>ef</td>
<td>EFI (FAT-12/16/32)</td>
</tr>
</tbody>
</table>

**GPT**

<table>
<thead>
<tr>
<th>Major</th>
<th>Minor</th>
<th>#blocks</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>0</td>
<td>78150744</td>
<td>sda</td>
</tr>
<tr>
<td>8</td>
<td>1</td>
<td>204800</td>
<td>sda1</td>
</tr>
<tr>
<td>8</td>
<td>2</td>
<td>20971520</td>
<td>sda2</td>
</tr>
<tr>
<td>8</td>
<td>3</td>
<td>976563</td>
<td>sda3</td>
</tr>
<tr>
<td>8</td>
<td>4</td>
<td>19531250</td>
<td>sda4</td>
</tr>
<tr>
<td>8</td>
<td>5</td>
<td>2929688</td>
<td>sda5</td>
</tr>
</tbody>
</table>
X configuration

- i810
- use 915resolution to set to 1280x800
- xkbset m will help with lack of right/middle mouse buttons
Kernel configuration

- Older kernels before 2.6.17 seems to panic 4/5 times.
- rtc.ko seems to be broken, use rtc-dev.ko
- sound: snd_hda_intel
- NW: sky2
  wifi: madwifi
- CPU frequency can be controlled with speedstep_centrino;
  apt-get install cpufreqd
madwifi

- `sudo apt-get install madwifi-source madwifi-tools`
- `sudo apt-get install madwifi-doc`
- `sudo m-a prepare`
- `sudo m-a a-i madwifi`
- `sudo modprobe ath_pci`

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Wonderful World of Mactel Debian
Why Debian on Macbook

Installing Debian on Macbook

Other goals

Buy MacBook
Process partition from Mac OS X
Install rEFIt
Install Debian
Configuration

madwifi

- sudo apt-get install madwifi-source madwifi-tools
- madwifi-doc
- sudo m-a prepare
- sudo m-a a-i madwifi
- sudo modprobe ath_pci
- sometimes seems to hang at boot; stability is not too good.
```bash
sudo apt-get install linux-uvc-source
  linux-uvc-tools
  sudo m-a prepare
  sudo m-a a-i linux-uvc
  sudo mount /dev/sda2 /mnt/mac
  sudo macbook-isight-firmware-loader
    /mnt/mac/System/Library/Extensions/IOUSBFamily.kext/
    Contents/PlugIns/AppleUSBVideoSupport.kext/
    Contents/MacOS/AppleUSBVideoSupport
  sudo modprobe uvcvideo
  sudo apt-get install ekiga libpt-plugins-v4l2
```
Intro

Why Debian on Macbook

Installing Debian on Macbook

Other goals

Buy MacBook

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Configuration

linux-uvc

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Wonderful World of Mactel Debian
Patches I made for this presentation

Using Debian enough for preparing for presentations.

- 377198: module-assistant: kernel modules cannot be built for 2.6.18-rc1
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- IR receiver hack: do presentation with IR remote.
- 375999: Debian refit package
- 379239: linux-uvc package
- 379867: gstreamer v4l2 support
IR Remote
IR Remote

- IR remote
- USB HID device
IR Remote

- IR remote
- USB HID device
- libusb and libXtst

3-minute hacking

```c
usb_detach_kernel_driver_np(uh, 0);
printf("claim: %p, %i\n", uh, (usb_claim_interface(uh, 0)));
while (1)
{
    if ((n = usb_interrupt_read(uh, USB_ENDPOINT, buf, size, timeout)) > 0)
    {
        int i;
        printf("key pressed: ");
        for (i = 0; i < n; ++i)
            printf("%x", (int)(unsigned char)buf[i]);
        printf("\n");
        if ((buf[0] == (char)0x25) &&
            (buf[1] == (char)0x37) &&
            (buf[2] == (char)0xee))
        // (buf[3] == 44) 4th byte is probably random.
        {
            printf("ack: \n");
            XTestFakeKeyEvent(display,
                XKeysymFromName(display, keymap[buf[4] >> 1]),
                1,
```
IR Remote

- IR remote
- USB HID device
- libusb and libXtst

3-minute hacking

There is already a kernel driver, you could do all this with xmodmap.

```
usb_detach_kernel_driver_np(uh, 0);
printf("claim: %p, %i\n", uh, (usb_claim_interface(uh, 0)));
while (1)
{
    if((n=usb_interrupt_read(uh, USB_ENDPOINT, buf, size, timeout))>

    int i;
    printf("key pressed: ");
    for (i=0; i<n; ++i)
        printf("%02x", (int)(unsigned char)buf[i]);
    printf("\n");
    if ((buf[0] == (char)0x25) &&
        (buf[1] == (char)0x37) &&
        (buf[2] == (char)0xee))
        // (buf[3] == 44) 4th byte is probably random.
        
        printf("ack: \n");
        XTestFakeKeyEvent(display,
            keymap[buf[4] % 16 >> 1], 1,
```
What next?

Devices that I haven’t touched yet

- suspend/sleep: kernel patch floating around, ACPI sleep should be possible.
- CD-R writing (libata-PATA support required?)
- backlight control
- bluetooth
- other yet unknown features ..
Wrap up

- Explained how to install Debian on Macbook
Wrap up

- Explained how to install Debian on MacBook
- Current status on Debian on MacBook and future directions
Wrap up

- Explained how to install Debian on MacBook
- Current status on Debian on MacBook and future directions
- Debian on MacBook is a reality, happy installing!