

# Kiwamu Okabe - Research and Development Engineer

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## Interests

Haskell programming, ATS programming, NetBSD kernel programming, Debian project.

## Work Experience

*July 2013 - present: Freelance*

- Research and develop Ajhc Haskell Compiler

*March 2012 - July 2013: MIRACLE LINUX CORPORATION*

- Verify PowerPC Linux and debug/fix SMP Race Condition
- Debug and fix PowerPC crash command's virtual memory paging BUG
- Design new Windows installer using NSIS
- Introduce and maintain new git server for internal use
- Verify and tune performance of Digital Signage on new hardware

*April 2001 - February 2012: Software Development Engineer at Ricoh Company, Ltd.*

### **April 2010: Port OS to new x86 hardware**

Port NetBSD-2.0 to new x86 hardware.

- Select BIOS product from three companies. Measure the quality, support, boot time and many evaluation items before choosing.
- Decide to change design from old Option BIOS.
- Calculate boot time before porting OS. Suggest and plan to tune boot time.

### **April 2008: Develop and technical support NetBSD OS**

Become technical leader to maintain and support Ricoh's multifunction printer. My efforts are following.

- Debug and fix virtual memory's page daemon.
- Debug and fix the BUG fail close(2) on only wifi network.
- Design power down process by software trigger, using Solid State Relay and watchdog.
- Get stability against shutdown on msdosfs

**April 2006: Technical support to version up NetBSD-1.5 to 2.0**

- Design NetBSD-1.5 style SD card format for NetBSD-2.0.

**April 2006: Develop POSIX thread library**

Replace user level POSIX thread library with NetBSD-2.0 m:n thread. My efforts are following.

- Research the presence of thread-safe and cancel-safe in kernel, libc and libpthread.
- Write test code to get thread-safe and cancel-safe.
- Add API into the m:n thread library. Because printer application depend on the missing API.
- Debug and fix signal BUGs in the m:n thread library.

**June 2004: Tune multifunction printer boot time as 10 seconds**

Before my tune, the printer boot time is 30 seconds. Ricoh's multifunction printer "imagio" <http://www.ricoh.co.jp/imagio/> use the method and tool, ever now. My efforts are following.

- Develop a tool analyze log dumped by bootloader, kernel, init process and application.
- Analyze IPC network, and advice how to get speed to application developer.
- Split application as groups for pre-boot and post-boot.

**October 2003: Develop new BIOS for multifunction printer**

Order new BIOS to new company. Develop new BIOS together at the United States.

**December 2002: Develop firmware in wifi chip**

Join team to develop wifi chip using ARM architecture.

**November 2002: Design secure boot for multifunction printer on x86**

My efforts are following.

- Port and design bootloader using public key algorithm authentication
- Design the format include secure key in SD card
- Order application to format SD card with custom partition, and support

**July 2001: Develop BIOS and bootloader for multifunction printer on x86 architecture**

My first work at Ricoh. Ricoh's multifunction printer "imagio" <http://www.ricoh.co.jp/imagio/> use my bootloader design, ever now. My efforts are following.

- Design specification to customize the BIOS for printer
- Order self-diagnostic program and support
- Design hardware dependent data structure to configure bootloader and kernel
- Design Option BIOS to boot on SD card

## Education

- March 2001: Master of Engineering from Department of Electrical and Electronic Engineering, Tokyo Metropolitan University.  
The thesis: “Multimode Quartz Crystal Microbalance” <http://ci.nii.ac.jp/naid/110004076869>

## Publications and Reports

- January 2014: “強い型による OS の開発手法の提案”, 第 55 回プログラミング・シンポジウム,  
[http://metasepi.org/doc/20140110\\_prosym55.pdf](http://metasepi.org/doc/20140110_prosym55.pdf)

## Activities

### *Open-source projects*

#### **Metasepi project**

- <http://metasepi.org/>
- Challenge to create an open-source Unix-like operating system designed with strong type such as ML or Haskell.
- Rewriting NetBSD kernel using Ajhc Haskell compiler. <https://github.com/metasepi/netbsd-arafura-s1>

#### **Ajhc Haskell compiler**

- <http://ajhc.metasepi.org/>
- Extend and add embedded features to Jhc Haskell Compiler <http://repetae.net/computer/jhc/>.
- Ajhc has thread-safe and reentrant runtime. Also has Erlang style GC. It means Ajhc's Haskell context has own GC heap. GC can run on tiny CPU such as Cortex-M3 with 32kB RAM.

#### **Japan ATS User Group**

- <http://jats-ug.metasepi.org/>
- An user group for ATS language <http://www.ats-lang.org/> promotion of utilization. Translating ATS documents into Japanese.

#### **Debian Maintainer**

- <http://qa.debian.org/developer.php?login=kiwamu@debian.or.jp>
- Maintained uim package at Debian squeeze, and packages using Haskell at sid.

#### **Carettah**

- <http://carettah.masterq.net/>
- A presentation tool written with Haskell. My slides [http://www.slideshare.net/master\\_q/](http://www.slideshare.net/master_q/) are created by the tool.

## Computer Skills

- Languages: Haskell, C, Intel assembler, Ruby
- Platforms: Linux, NetBSD, Android NDK

## Reference available upon request

- Takashi KODAMA CEO - MIRACLE LINUX CORPORATION
- Shigeya SENDA - Ricoh Company, Ltd.
- Hitoshi Sekimoto Professor - Tokyo Metropolitan University, Department of Electrical and Electronic Engineering

Last updated: January 24, 2014