In Memory of Jim Ready

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It was just before Christmas of 2017 when I received the shocking news from my long-time friend Andre Kobel, that Jim Ready passed away. I last met Jim late 2016 to send him a copy of my book *Embedded Operating System: History of Development and Future of the Internet of Things* as an acknowledgment to his preface. We also discussed the plan to translate the book to English. It is very saddening that barely one year later, we have to say goodbye to him.

Jim and me in Cupertino, 2016

After Christmas, I attended Jim's funeral at St. Simons Church in Lost Altos. As one of Jim's friends said in the service, Jim was not among the well-known Silicon Valley citizens, but he surely was a dedicated entrepreneur, and one of the pioneers of embedded Linux. May Jim, a friend of mine of 20 years, rest in peace.

First in Commercial RTOS

In 1980, Jim Ready and Colin Hunter founded Hunter & Ready, which later become Ready System. Jim developed the world's first commercial RTOS - VRTX (Versatile Real-time Executive), which provides a real-time kernel with developer API and charges license fee to chip manufacturers or end-users. Many of the successfully commercial RTOS follow the same model, including ISI pSOS and Wind River's VxWork. VxWork was called VRTX Works, since it originated from VRTX, with added TCP/IP stack, file system and Compiler/debug tools to support more complex applications.

The initial release of VRTX, VRTX32, supports 16-bits CPU like Intel x86. In the 90s, Jim led the upgrade of VRTX32 to VRTXsa, which was one of the earliest examples of microkernel RTOS (around that time Microtec acquired Ready System). In late 1990s, Mentor Graphics acquired Microtec and released VRTXmc, which was installed on mobile phones by Motorola. VRTX was gradually phased out in the industry after VRTXmc, but Jim Ready was

surely the first in commercial RTOS.

VRTX development environment

Pioneer of Embedded Linux

In the late 90s, Jim set his eyes on a rising new phenomena, open source Linux. I recall Jim gave me a Linux installation disc and suggested me to keep an eye on the new industry trend, but unfortunately, I did not think much about it at that time.

Jim vision that open source Linux will find its way into embedded system, and his second entrepreneurship was exactly in this direction. In 1999 Jim founded MontaVista and the first released product was Hard Hat Linux. The name "Hard Hat" implies some connection to Red Hat, an open source Linux distribution that champions commercial subscription model.

你正在寻找一条嵌入式系统开发的
开放的道路？
MontaVista 就在你的身后。

Early MontaVista Ad, it says:
"Are you looking for an open road of embedded system development?
MontaVista is right behind you."

Hard Hat Linux (later became MontaVista Linux) specializes in providing technology and service to embedded system. Hard Hat Linux 2.4 offered real-time technology (RT-path), LSP and cross-development support for various microprocessor. MontaVista enjoyed big success at initial stage, with adoption from Montorla, NEC, Sony etc. and twice investments from

Sony. By 2005, MontaVista grew its list of customers to over 2000. However, as a 100% open source company, MontaVista struggled to settle with an innovation business model and make profits. After the financial meltdown of 2008, MontaVista was acquired by Network semiconductor company Cavium in 2009. Coincidentally, Intel purchased WindRiver in the same year, ending the 20-year competition story of the duo.

Today, Linux and Linux-based Android are still the most widely used OSes of embedded system. Both commercial and open source embedded Linux still follow about the same technical route and business model Jim pioneered. Some call Jim a founding father of embedded Linux, which he rightfully deserve.

A Mentor and a Friend

Jim led me into embedded system field. He was the speaker of my first real-time technology seminar, and I still remember his demo clearly; he showed us a running instance of VRTX on PC and show the task status in RTscope debugger. We had been in touch since then. When I decided to launch my own business in 1994, Jim and Andre (who was responsible of international business in Jim's company) were very supportive. The effort would become BMR Technologies in Beijing, an embedded software company.

Jim was the mentor of my career and a 20-year friend. I am honored to be a part of both of Jim's entrepreneurship, where he influenced many people. Some of this group of people would remain in the industry years later.

Jim was always sharp at foreseeing industry and technological trends. We talked about Google IoT OS (called Brillo at that time) in 2015 when he was the chief technology advisor of Cadence. He pointed out that the main business opportunity of IoT OS at the cloud side, not device side. Proving the point, Alibaba AliOS, Microsoft Windows 10 IoT, Huawei LiteOS and Amazon FreeRTOS are all highly optimized for its own cloud offering.

Jim was a funny and easy talker, he would greet us Asian colleagues with our mother tongue in the annual meetings, and ask us if we have eaten (a way of greeting in China). He was a big fan of Chinese cuisine; Shanghai steam bun was perhaps his favorite (he would order it every time).

China's embedded system industry was booming in the early 90s, Jim attended seminars and visit customers/partners about every two years. With his support, Microtec established a joint laboratory with University of Electronic Science and Technology of China, first Embedded System Joint Lab in China.

Jim continued to support Linux development in China even after he started MontaVista and had to visit China less frequently. In 2004, MontaVista Linux Beijing Research Center was established; Some of the engineers in the center would continue to contribute to open source projects in the companies like Intel and Ubuntu

Jim and Raymond (MontaVista Asia-Pacific VP, left), and me at BMR, 2003

Having followed Jim's footprint for 20 years, I have grown from an engineer who knows little about embedded system, to an expert, entrepreneur and educator in the field. I have also been sharing my experience and expertise to friends in the industry in China, which I take pride in. As I continue to educate and advocate open source RTOS and IoT OS, I trust Jim would be glad looking at my endeavor.

Farewell, Jim. We will always remember you.

Feb.10th, 2018