

# The Open Pitt



What's cooking in Linux and Open Source in Western Pennsylvania

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## Linux and PowerPC: Interview with Henry Keultjes

Originally from The Netherlands, Henry Keultjes joined Sperry Rand in the mid-1960's as a systems analyst and sales consultant. He later formed Microdyne Company as a system reseller, then acquired an ergonomic chair manufacturing business. His experiences led him to develop an integrated manufacturing software suite.

Henry subsequently sold the chair business to focus on software and is now involved in multi-dimensional databases. Working with the IBM RT (an early RISC system) and its successors convinced him that the PowerPC processor is ideal for database applications. In a 2001 article titled "Perfect Pair: PowerPC and Linux" <<http://www.ncolug.org/pp.html>> he argued that low-cost PowerPC-based desktop Linux machines could challenge the Microsoft/Intel duopoly.

At October's Ohio LinuxFest, he showed a demonstration model of his "LinuxPC" made by Mai Logic. He kindly agreed to an e-mail interview.

*You seem to feel that today's business software applications (and the hardware needed to run them) are bloated with features which add no real value.*

Correct, if by business applications you mean things like Microsoft Word or applications like ERP that run on one of the Windows platforms.

At the end of 1989, the software that I developed for our direct sales ergonomic chair manufacturing company, including all the data from 15 years of operation as well as the database software and the embedded OS functionality, fit on one 150MB tape.

In the successor company that software achieved nearly unequaled productivity for a highly integrated manufacturing company: \$350,000 sales per employee per year. It did as much, or more, as today's best ERP systems because it was totally integrated.

*If simple, integrated software is so productive, why is the "rich" multi-media desktop PC ubiquitous today?*

Stupidity, ignorance, keeping up with the Joneses—pick one or all or add your own popular reason for people to pay for something whose features they hardly use. SUVs are a good analogy. I am not an SUV basher at all, but it is obvious that they are rarely used in their true element which is off-road. On the roads where they are used, their driving characteristics typically make them more dangerous to the user as well as surrounding drivers.

The one and only reason that the Microsoft desktop is ubiquitous is Bill Gates' sandbox kid personality that drove him to demand exclusive OEM installs. While the latest antitrust case outlawed the exclusivity, it came only after Microsoft had a 95%+ market share.

*Are you also an advocate of the thin-client computing model?*

To me that's the only way to do computing, whether it be in a business or even at home where it is the only model that allows parental control. I especially like the "credit card" concept that allows users to move from one machine to the other and "carry" their desktop with them.

While most people think of SunRay for this type of application, the same thing has worked on IBM thin-clients for many years and worked for us in the dumb-terminal era except that we had to type our user ID in, instead of being able to simply swipe a card.

*Is the motherboard you demonstrated at the LinuxFest shipping in quantity?*

At the Modern Computing Technology show in China, Mai Logic demonstrated 300 of these boards running on an IBM OpenPower 720. The lot sizes of the boards being manufactured will increase gradually. Most of the boards produced so far are staying in China because the market there is more receptive to OpenPower. When [the IBM/Lenovo deal is completed] the USA PowerPC market situation will change rapidly.

*How do you propose to standardize other parts of the platform, like the supporting chipset? How do you get compatible on-board peripherals?*

See **POWERPC**, p. 2

### Coming Events

- Dec. 11:** Tutorial, Topic: Kernel Configuration. 10AM to 2PM, 1507 Newell-Simon Hall, CMU
- Jan. 8:** Installfest. 10AM to 5PM, 1507 Newell-Simon Hall, CMU
- Jan. 15:** General User Meeting, Topic: User Mode Linux. 10AM to 2PM, 1507 Newell-Simon Hall, CMU
- Feb. 5:** General User Meeting, Topic: Building and Using RPMs. 10AM to 2PM, 1507 Newell-Simon Hall, CMU
- Feb. 19:** Tutorial, Topic: System Administration. 10AM to 2PM, 1507 Newell-Simon Hall, CMU

*The public is welcome at all events*

## November Roundup

*Nov. 6 General User Meeting:* **Avram Avishai** gave an overview of Mac OS X. Based on an open-source Darwin core, Apple layers its proprietary Quartz display engine and Aqua user

interface on top. Avi demonstrated new features like managing open windows with Exposé, Rendezvous zero-configuration networking, and Spotlight, a whole-system search engine.

**POWERPC**, from p. 1

That's the neat thing behind having the cooperation of VIA, its Mini-ITX designs and chipset capabilities. However, if you look at the Mai Logic site you will find that its million+ gate logic capabilities are driving this project. Mai Logic is in essence vertically integrating in order to sell the PowerPC chipsets. Once we go beyond the Mini-ITX board to a system-on-chip (SoC) design, then those issues become much easier to solve because any of those technologies can simply be licensed for inclusion on the SoC die or they can be taken from Open Source projects.

*Up to now, SoC designs have largely been relegated to embedded projects.*

Why should a desktop system not be an embedded system? That's at least what I reasoned when I wrote the Perfect Pair article. What's the real difference between a set-top box, a GameCube, and a desktop PC? Very little, and so building on the higher volumes of embedded markets makes a lot of sense because they will leverage on each other for lower costs.

*Many vendors make plug-in hardware for the IBM PC architecture. Is there any interest in the LinuxPC platform?*

IBM is working hard at lining up partners for the PowerPC core and it seems logical that some of these designs will end up in desktop systems. Once momentum is evident it is also logical that other companies will jump on the bandwagon.

However, the basic manufacturing concepts from the original IBM PC are doomed. There will perhaps be half a dozen companies in the world that will make SoC modules, just like IBM makes modules in million+ lots for the Nintendo GameCube. Visualize sticking such a module on the back of an LCD monitor and it is evident that most of the value added comes from manufacturing the LCD and the PowerPC module. That module would probably sell for about \$70. The rest of the value added will be peanuts.

*Back in the mid-90's, IBM developed two unsuccessful PowerPC platforms,*

*PReP and CHRP. How can your proposed platform avoid a similar fate?*

The main problem with both projects is that they went after existing PowerPC markets whereas the LinuxPC goes very clearly after x86 market share only. Also, the PowerPC architecture has advanced considerably since then and so it is fairly easy now to add things like improved I/O capabilities to the chip with internal wiring. IBM has phenomenal I/O capabilities on its OpenPower platforms that range from the OpenPower 720 Linux box all the way up to the i, p, and zSeries machines.

The way I see it, the PowerPC server market is already well served by both IBM and Apple. The desktop is a lot more price sensitive and before hundreds of PowerPC white boxes are bought to hang on the single PowerPC server, a certain price compatibility has to be met.

*The Mac is the best-known PowerPC desktop, but many consider it expensive. Is keeping cost down for the LinuxPC just a matter of volume?*

No, it is a matter of attitude. Steve Jobs is a remarkable guy who could have had a 100 million/year Mac market had he set his mind on doing that. Instead Jobs is an elitist and a cream-skimming marketer. Nothing wrong with that if it makes him money, as it obviously does. My eyes, on the other hand, are on market share.

*How can Intel be a monopoly when others offer x86 processors?*

Intel is an effective monopoly because of its tactics. It uses all kind of means to prevent board manufacturers from giving its competitors too much market share. One of those is slowing down or stopping delivery of its processors to board manufacturers that do not toe the line. Since there are no board manufacturers here in the USA, those tactics cannot effectively be prevented nor punished with US laws.

*Doesn't IBM exercise as much control over PowerPC as Intel has over x86?*

No, the PowerPC design is Open. Both Motorola and Apple were part of the originators. Since then several

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other companies, including Microsoft, Samsung and Chartered Semiconductor (Singapore) have joined the club. You, Vance Kochenderfer, could effectively join that club. However, those companies have no obligation to share their knowledge of implementing the design. Companies can even make changes to the actual PowerPC processor core, if they see benefits in doing so. Thus while Intel sells chips, IBM sells services; designing and fabricating chips.

*Why do you pick PowerPC over other RISC designs like MIPS and ARM?*

The main reason for favoring PowerPC as that all of IBM's own servers run on it. Therefore one can develop a software architecture that is portable all the way from Linux on the GameCube to Linux on the IBM zSeries. There is nothing on this earth that can match that. The second reason is also because of those servers which gives IBM the capability of giving us greatly improved compiler technology. Some of the second-round improvement in OS X was purely related to IBM making that compiler technology available to Apple.

*Linux support for PowerPC and other platforms tends to lag behind x86. Is this a problem for the LinuxPC?*

Not really. There is money to be made in supporting these LinuxPC platforms and therefore existing companies and/or new companies will step up to the plate to take existing Linux Open Source code and make it ready for these PPC platforms.

*Thank you for your time!*