

Want to understand why Linux is the most important OS in the world? Pay attention to Linux wristwatches.

“ In the aftermath of LinuxWorld, the open source conference that took place in San Jose, Calif., in August, we’re now being treated with press releases announcing Linux as Almost Ready for the Desktop.

It is not.

Even if Linux were to achieve double-digit penetration among the world’s PC users, it would be little more than an also-ran desktop OS. For Linux, the real action is else-

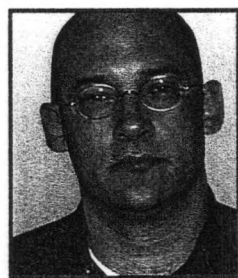
where. Adaptive radiation requires new environments not already crowded with competitors and organisms adaptable enough to take advantage of those environments. So it is with Linux—after a decade of computers acting as either clients or servers, new classes of devices are now being invented almost weekly—phones, consoles, PDAs—and only Linux is adaptable enough to work on most of them.

In addition to servers and the occasional

attempt to simply repackage the Windows interface for PDAs rendered early versions of WinCE unusable.)

Another lesson is that being merely good enough has better characteristics for adaptive radiation, and therefore for long-term survival, than being Best of Breed.

Linux is not optimized for any particular use, and it is improved in many small increments rather than large redesigns. Therefore, the chances that Linux will become a better high-availability server OS than Solaris, say, in the next few years, is tiny. Although not ideal, Linux is quite a good server, whereas Solaris is unusable for game consoles, digital VCRs, or wristwatches. This will keep Linux out of the best of breed competition because it is never perfectly tailored to any particular environment, but it also means that Linux avoids the best of breed trap. For any given purpose, best of breed products are either ideal or useless. Linux’s ability to adapt to an astonishing array of applications means that the chances of it being able to run on any new class of device are superior to a best of breed product.



Darwin, Linux, and Radiation

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where. If you want to understand why Linux is the most important operating system in the world, ignore the posturing about Linux on the desktop, and pay attention to the fact that IBM has just ported Linux to a wristwatch, because that is the kind of news that illustrates Linux’s real strengths.

At first glance, Linux on a wristwatch seems little more than a gimmick—cell-phone displays and keypads seem luxurious by comparison, and a wristwatch that requires you to type “date” at the prompt doesn’t seem like much of an upgrade. The real import of the Linux wristwatch is ecological, though, rather than practical, because it illustrates Linux’s unparalleled ability to take advantage of something called “adaptive radiation.”

Let’s radiate

Adaptive radiation is a biological term that describes the way organisms evolve to take advantage of new environments. The most famous example is Darwin’s finches. A single species of finch blew off of the west coast of South America and landed on the Galapagos Islands, and as these birds took advantage of the new ecological niches offered by the islands, they evolved into several separate but closely related species.

desktop, Linux is being modified for use in game machines (Indrema), Internet appliances (iOpener, IAN), handhelds (Yopy, iPAQ), mainframes (S/390), supercomputers (Los Lobos, a Beowulf cluster), phones (Japan Embedded Linux Consortium), digital VCRs (TiVO), and, of course, wristwatches. Although Linux faces fierce competition in each of these categories, no single competitor covers every one. Furthermore, given that each successful porting effort increases Linux’s overall plasticity, the gap between Linux’s diversity and that of its competitors will almost inevitably increase.

Where ‘good’ beats ‘best’

In a multidevice world, the kernel matters more than the interface. Many commentators (including Microsoft) have suggested that Linux will challenge Microsoft’s desktop monopoly, and among this camp it is an article of faith that one of the things holding Linux back is its lack of a single standardized interface. This is not merely wrong, it’s backward—the fact that Linux refuses to constrain the types of interfaces that are wrapped around the kernel is precisely what makes Linux so valuable to the individuals and companies adapting it for new uses. (The corollary is also true—Microsoft’s

The real action

The immediate benefits of Linux’s adaptive radiation ability are obvious to the Linux community. Since nothing succeeds like success, every new porting effort increases both the engineering talent pool and the available code base. The potential long-term benefit, though, is even greater. If a Linux kernel makes interoperation easier, each new Linux device can potentially accelerate a network effect, driving Linux adoption still faster.

This is not to say that Linux will someday take over everything, or even a large subset of everything. There will always be a place for “Best of Breed” software, and Linux’s use of open protocols means its advantage is always in ease of use, never in locking out the competition. Nevertheless, only Linux is in a position to become ubiquitous across most kinds of devices. Pay no attention to the desktop sideshow—in the operating system world, the real action in the next couple of years is in adaptive radiation.”

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