Freedom Inside

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WARNING: This device may contain Free and Open Source Software. It may upset existing business models. Possible applications may cause dizziness. Opening the box may no longer void your warranty. Once open, closing the box can prove extremely difficult...

Quietly, almost by stealth, Linux has taken over the greater share of 32 and 64 bit embedded designs. Networking equipment, wireless hot-spots, mobile phones, medical monitors, industrial control systems, robots, in-car devices, multi-function printer/copiers, attached storage and myriad other applications now make their ways into our workplaces and homes with Linux on-board. According to VDC, one in four intelligent devices designed and deployed today embeds Linux, with more to come in next-generation applications.

Device manufacturers build on Linux for a variety of reasons, some in common with enterprise IT, others more unique to embedded. Like other IT folk, device OEMs look to Linux to avoid vendor lock-in, to leverage off-the-shelf hardware and software, and to reduce software acquisition costs. They also can increase slim margins with Open Source by deploying without costly proprietary run-time royalties.

Smart OEMs turn to Linux and Open Source to unify divergent software across product lines, and so reduce hiring, training, engineering and support expense. With Linux as a strategic platform, embedded OEMs can re-use drivers, middleware and often applications in multiple product tiers (entry-level, feature, and deluxe) and niche models (Motorola a760, a768, a780, e860i, etc.). They can even reuse software across product lines (Sony's HDTVs, Cocoon media boxes, broadband routers, in-car navigation systems, even versions of the PlayStation 2). Broad CPU support in Linux lets these same companies unify their hardware investments. And perhaps most interesting is that OEMs shipping Linux-powered products have the option to supply closed devices with fixed function sets, or to create open platforms that their channels, third-parties and even end-users can customize and use to build new applications (think TiVo).

And yes, of course device OEMs choose to deploy Linux because a full-featured embedded OS translates into a rich experience for the end-user.

The music swells. Linux – coming soon to a device near you. End commercial.

Didn't you get right up and rush out to your electronics superstore? Are you now eagerly surfing on-line vendors, looking for those gadgets with the Penguin Inside? Can you actually find them? Or don't you care?

Linuxdevices.com founder Rick Lehrbaum recently polled audience members at a well-attended eSeminar. Even with the Linux predilection of the audience, just 7 per cent indicated a preference for Linux-based consumer electronics; 8.5% even preferred embedded Windows widgets, for desktop compatibility; over 70 per cent of those polled indicated no preference in embedded OS, shopping instead for price/functionality of the device.

No huge surprises – most device users of all types, from consumer to industrial, only concern themselves with the innards of smart gadgets when those baubles fail or don't play well together. And while a few manufacturers tout their choice of platform, most guard that info as, well, proprietary.

Producers and end-users of some embedded applications DO seem to care. One example is Wyse Technology, which today ships several successful lines of thin clients. They offer versions of their "net-centric" Winterms built with a proprietary RTOS, WindowsCE, WindowsXP, and with Linux. I asked Wyse product managers, if the different Winterms can present the same content, why should a user care what's in the box? Wyse explained that the company positions each based on how they and customers view the virtues of the OS: the RTOS-based product is fast; the WindowsXP device is flexible, in that it include Java, video and other Windows-based functions (layering fat and cost on an otherwise thin client); the WindowsCE client is powerful, in that it offers a Windows GUI in a small cheap package; and the Linux Winterm is adaptable, in that it scales from a simple client to a near-workstation, and does so at a very aggressive price. End-users like the Linux version – it is Wyse's fastest-growing product line.

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Another case in point is regional communications operators, who today can provision their networks with kit based on Carrier Grade Linux from almost two dozen equipment providers (Alcatel, Ericsson, NEC, Nokia, Siemens, et al.). Operators and carriers don't choose their switches and SLAMs because Linux is cool; they look for CGL inside because they helped specify its capabilities and they depend on its robustness and its management interfaces.

So, while device manufacturers are adopting Linux in droves, for tactical and strategic, technical and financial reasons, device end-users are not drawn to Linux-based devices because of Linux itself. Even with available open box designs like TiVo and Zaurus, the vast majority of end-users focus on function and price, not the innards of the platform. Even Richard Stallman, in conversation at OSDL last year, took pains to limit his concerns about software freedom to devices where he can choose the software deployed.

The day will soon arrive, however, when device users will be able to choose, not the software in a given device, but devices based on what software is in them. Microsoft is trying to hasten that Day of OS Judgment – and clearly hopes to see a market flooded with gadgets boasting "Windows Mobile" on little silver labels. Before that day arrives, we need to encourage OEMs to tag Linux-based devices with their own labels, writ large for the near-sighted consumer, proclaiming "Freedom Inside".