

Embedded Linux has all the power any smartphone manufacturer might need. That might be the biggest problem facing its adoption, says Rob Buckley

Qt phone home?

The versatility of Linux is well known. It can run on the smallest portable devices to the largest servers. But there's a difference between the ability to do something and actually doing it.

So-called "smart" mobile phones might seem like one of the best possible opportunities for Linux to dominate a market. Smart phones offer the standard features of a phone but allow other applications to run, including those installed by users—assuming network providers let them. With no long-standing user-base of Windows to fight against and with less rich functionality required than on a PC, Linux should be finding the mobile world far easier to conquer than the fixed computing world.

The sheer power of Linux is unfortunately the number one factor contributing to its slow uptake on the phone

Eirik Chambe-Eng, the co-founder of TrollTech, which produces the Qtopia development environment and GUI used by many Linux mobile phone makers, predicts a revolution in the use of open-source software on phones and handheld devices. He argues that Linux gives handset manufacturers and OEMs complete control over their devices, which in turn keep Microsoft and Symbian at bay and avoids the need for each manufacturer to develop its own operating system.

It's an argument that appears to have won over more than a few manufacturers, although they appear to want their own platform rather than TrollTech's. Motorola, NEC, NTT DoCoMo, Panasonic, Samsung and—surprisingly—Vodafone have joined together to launch an as-yet

unnamed foundation designed to create a universal mobile Linux platform. The foundation will focus on the joint development and marketing of an API specification and architecture. It will support source-code-based reference implementation components and tools, and take advantage of "the benefits of community-based and proprietary development".

Yet despite this support and the advantages for handset manufacturers, embedded Linux is struggling. According to analyst group Canalsys, growth in smart device sales is currently running at 73%. Despite phone makers such as NEC, Siemens, Panasonic, and Samsung all having Linux-based devices, Linux trails both Symbian and Microsoft in this mobile operating system popularity contest: Symbian has 67% share of the market, while Microsoft has 15%.

By far the biggest user of Symbian operating systems is the number one mobile phone manufacturer Nokia, which sold over nine million Symbian-based phones during the last quarter. This isn't totally surprising since it owns a big portion of Symbian. By comparison, Motorola, the biggest seller of Linux-based smartphones and the second-biggest mobile phone vendor after Nokia, only managed to sell a million of its 'Ming' Linux-based phones, and that was predominantly in China. If anyone is going to get Linux into people's phones, it's Nokia.

So far, Nokia has remained firmly behind Symbian for its mobile phone range. "We think Symbian remains the best platform for mobile phones," says Ari Virtanan, vice president, convergence products at Nokia.

However, Nokia isn't a manufacturer of just mobile phones. As Virtanan's job title suggests, Nokia also deals with "converged" products, such as the Nokia 770 Internet tablet. This is a halfway house between smartphone and laptop. It has built-in WiFi and Bluetooth, provides a browser and email tools, runs a version of Debian Linux, and has a flourishing developer community and development environment. In addition, Nokia has its own development team working hard on Linux-based products. It has also partnered with Google to include VoIP-based on Google's Jabber-based Google Talk service—doing pretty much all the technical work necessary itself, it must be pointed out.

So why the dichotomy? Why is Nokia committed to Linux in converged products but not in mobile products? Apart from the obvious financial rewards of having a stake in the company that produces the most popular smartphone OS—one that charges licensing fees per device shipped—there's the thorny matter of the SIM card.

"We decided not to include mobile phone functions in the Nokia 770, because then we'd need approval from the network providers",



**Worldwide total smart mobile device market
Market shares Q2 2006, Q2 2005**

Vendor	Q2 2006 shipments	% share	Q2 2005 shipments	% share	Growth Q2'06/Q2'05
Total	18,944,310	100.0%	12,185,600	100.0%	55.5%
Nokia	9,030,840	47.7%	6,695,800	54.9%	34.9%
Motorola	1,586,870	8.4%	556,050	4.6%	185.4%
RIM	1,183,430	6.2%	897,280	7.4%	31.9%
Sharp	1,162,500	6.1%	29,840	0.2%	3795.8%
Palm	1,131,120	6.0%	1,057,420	8.7%	7.0%
Others	4,849,550	25.6%	2,949,210	24.2%	64.4%

Source: Canals estimates, © canals.com ltd. 2005-2006
Smart mobile device market: handhelds, wireless handhelds, smart phones

The Nokia 770 Internet tablet: Linux included
and no SIM card required

says Virtanan. Many network providers deliberately remove functions from mobile phones that they feel will compromise the revenues they can generate from phones' owners. The US network Verizon, for instance, hobbled some Motorola phones' abilities to send files via Bluetooth because it would have impinged on Verizon's online file-sharing scheme. Without endorsement from network providers, there are fewer ways to get phones into consumers' hands, no contract bundles to take advantage of, and consumers would have to pay full price for the phone, rather than the subsidised prices the networks offer. All in all, financial disaster for the number one phone maker.

A Linux-based device would have almost unlimited abilities to add functionality, as the Google Talk deal shows. That would reduce network providers' revenues. Nokia might be able to develop a phone running Linux, but would it be able to get a network provider to endorse it? It's no coincidence that most of the sales of Linux-based phones have been to China and other countries whose network providers have not yet developed comparable revenue-generation schemes to Verizon's.

The sheer power of Linux is unfortunately the number one factor

contributing to its slow uptake on the phone. While the barriers to its adoption are decreasing as industry momentum falls behind it, there are still plenty of problems to be overcome. Proprietary systems that can be locked down by network providers, such as Windows Mobile and Symbian's Series 60, will continue to have the edge for some time. But, hopefully, not forever.



Nokia 770
<europe.nokia.com/770>

Nokia 770 developer community
<www.maemo.org>

Google Talk
<www.google.com/talk>