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How Linux saved Amazon millions

By [Stephen Shankland](#), [Margaret Kane](#), and [Robert Lemos](#)
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update Online retailer Amazon.com shaved millions of dollars from its technology costs last quarter by switching to the Linux operating system, a disclosure that could provide some guidance for other companies seeking to cut expenses in a stagnant economy.

In a filing with the Securities and Exchange Commission, the e-commerce giant said it was able to cut technology expenses by about 25 percent, from \$71 million to \$54 million.

The reduction was attributed primarily to Amazon's "migration to a Linux-based technology platform that utilizes a less-costly technology infrastructure, as well as general price reductions for data and telecommunication services due to market overcapacity," according to the filing.

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In a related development, an Intel executive said Tuesday that the Napster file-swapping service and Linux [inspired the company](#) to overhaul some of its technology infrastructure.

Amazon's disclosure could provide hard data for Linux proponents who have long argued that the open-source software can save corporations money over the Microsoft alternative. A Microsoft

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representative, however, warned that short-term savings seen by Amazon could turn into a long-term increase in costs.

Linux, a [10-year-old](#) clone of the Unix operating system and a competitor to Windows, burst onto the scene in the late 1990s and now is an [established](#) force in the computing industry even though many companies pushing it are [faltering](#). A recent [study](#) found that Linux is more powerful than some versions of Unix, but Linux in businesses is used more often on lower-end servers than on the powerful machines at the heart of large companies. But because Linux is essentially a clone of Unix, it's a more natural candidate to replace Unix than the dissimilar Windows.

Linux, which is developed by numerous volunteer programmers and companies, has some major pricing advantages.

"We've recently...found that Linux--if you look at the overall cost of ownership including the hardware, software, staffing, and purchasing and retirement costs--ends up being significantly less expensive than Unix over a three-year period for things like Web serving," said [IDC](#) analyst Dan Kusnetzky.

Half the price tag

For 1,000 users tapping into a Linux server, the total cost is about a fifth to a half that of a Unix system, Kusnetzky said. The cost of administering a Linux system is about the same percentage of the overall cost for a Unix or Windows server, he added.

Cutting expenses is certainly important for Amazon right now. The company [trimmed](#) its losses by 30 percent in the third quarter, posting a net loss of \$170 million. Amazon has pledged that it will be profitable on a pro forma basis by the fourth quarter, and with revenue inching up only \$1 million from the year-ago quarter to \$639 million, every little bit helps.

According to Internet research firm [Netcraft](#), Amazon's Web pages are dished out by Linux servers running Red Hat's [Stronghold](#) Web server, a derivative of the open-source [Apache](#) project.

Amazon executives could not immediately be reached for comment.

Linux can cut costs in several ways. When a company first obtains the operating system, the software can be downloaded for free, or a single copy purchased from a company such as Red Hat or SuSE can be installed on as many computers as a company wants. Secondly, it comes bundled with other software for sending Web pages to people's browsers or running company e-mail.

Thirdly, in many cases companies don't have to pay extra

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licensing fees for the computers that connect to Linux servers. And finally, Linux is often used on inexpensive Intel computers, sometimes generic "white box" machines and sometimes older computers seeing a second life.

Linux has enjoyed strong penetration into the server market, accounting for 24 percent of server operating-system shipments in 1999 and 27 percent in 2000, Kusnetzky said. That's second to Windows, which went from 38 percent in 1999 to 42 percent in 2000.

But there are hidden costs to Linux, Microsoft argues. "I think a lot of customers are lured by the apparent low price of Linux," said Doug Miller, director of competitive strategy for Microsoft's Windows division. "They don't have a real issue with Linux, but it ends up costing them in the long run."

With Linux, customers "end up being in the operating systems business," managing software updates and security patches while making sure the multitude of software packages don't conflict with each other," Miller said. "That's the job of a software vendor like Microsoft."

While Red Hat offers some of those services, it's difficult to ensure that software packages updated frequently by hundreds of people around the globe work well together, Miller said.

Linux largesse

Amazon said in June that it was [revamping](#) its computer systems and switching to "commodity" computers running Linux. Executives said at the time that they expected technology costs as a portion of net sales would decrease by 20 percent this year.

While the company may have saved money going to Linux, there still was funding to go around. Two beneficiaries were Hewlett-Packard and Red Hat.

HP supplied Amazon's Linux servers, large numbers of thin, rack-mountable models with Intel chips, said Mike Balma, marketing director for HP's newly formed Linux Systems Operation. And Red Hat customized Linux for the servers.

HP has been working with Amazon since October 1999, Balma said, but the big contract win came in May 2000, when HP [announced](#) its systems would replace Unix servers from Sun Microsystems.

HP helped Amazon migrate its customized software from the earlier servers to the Linux servers that dish up Web pages as well as to higher-end HP Unix servers for the heavy-duty systems nearer the heart of the operation, Balma said. "They're basically

an all-HP shop."

Red Hat spearheaded Amazon's switch over to Linux, said Billy Marshall, vice president of enterprise sales and marketing for the Durham, N.C., company.

"Amazon has been a customer of ours for over a year now," he said. "Each of the transactions that goes through their systems touch our technology. Now they are locked down for the holiday season. They are very happy with the output that they are getting."

With Linux systems cheaper than Unix systems, the current lean times offer a silver lining for the surviving Linux companies.

"I think things are very good for Linux--particularly in a down economy," Marshall said. "Companies are looking for alternatives to expensive proprietary systems that they were all too willing to shell out for in the go-go days."

On the desktop

Some companies are even putting Linux on the desktop to save money. Though Linux has a low penetration there--Linux accounted for only 1.5 percent of operating systems shipped for desktop use in 2000, compared with 92 percent for Windows, Kusnetzky said--some forces are aligning to increase its possibilities.

Among those forces: the coming [version 6](#) of Sun Microsystems' StarOffice package of office software, which many believe will be a more capable product than the bulky current version and thus a more credible alternative to Microsoft's Office; [burdensome](#) Microsoft licensing fees during a time of economic austerity; and the overall price tag of Windows and Office.

"People are looking at Linux as a replacement for Windows," said Chad Robinson, an analyst at [Robert Frances Group](#). "Not that people are switching en masse, but many corporations are exploring that area" chiefly for special-purpose desktops such as bank teller computers.

"The potential for cost savings there is huge," Robinson said.

In late September, independent consultant Rob Valliere published the results of a business study that convinced his small-business client to adopt Linux for a 24-person company. The bottom line: Switching the majority of computers to Linux would provide nearly the same functionality as an upgrade to Windows 2000 and save the company more than \$10,000.

The [study](#) concluded that Linux applications could provide solid

alternatives to nearly every Windows application, with the possible exception of the scheduling and e-mail integration of Microsoft Outlook.

In the study, Valliere found that licensing fees for 24 copies of Windows 2000 and Office 2000, along with a Windows 2000 server and necessary memory upgrades, would cost about \$15,000. Installing Linux on the server and 20 of the computers--with the remaining four upgraded to Windows 2000--would cost slightly more than \$5,000, including consulting and installation fees.

Cracking the whip

Another financial incentive to use Linux on the desktop is that Linux's open-source licensing makes it simpler for a company to make sure its computers are in compliance with license restrictions, as opposed to Microsoft's per-seat licensing plans that can result in costly and legally daunting audits.



"Staying in compliance with licenses is something a lot of companies are scared of right now. It's more difficult, and the ramifications of being out of compliance are becoming more and more onerous," Robinson said. "As of the last year or so, Microsoft has been going after companies where they've gotten tip-offs or had other suspicions."

With Windows XP and Office XP, Microsoft now has a better tool to enforce license compliance: [product activation](#) technology that locks versions of Windows and Office to a particular computer.

"We are a commercial software vendor. That's how we earn revenue," Miller responded. "Our goal is to be properly compensated by customers for our software."

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