When the founders of Tradeworx, a hedge-fund firm and technology provider, started their business in 1999, they had to decide whether to run mission-critical systems on proprietary platforms from established operating system vendors such as Microsoft or Sun Microsystems or to build their own applications using Linux. The difference in cost could amount to hundreds of thousands of dollars. Mike Beller, Tradeworx’s chief technology officer, estimated that using a proprietary system could cost $6,000 or more per CPU, while a Linux-based system would only cost $1,000 to $2,000 per CPU. Cost savings could range from 20 to 70 percent. Beller decided to cluster a number of inexpensive Pentium CPUs together using the Linux operating system. Linux proved to be inexpensive and extremely stable.

Businesses using Linux used to be a tiny minority but their ranks are swelling. The Dreamworks motion picture studio clustered a series of Linux servers to program the complex graphics for the successful film Shrek. Similarly, Boeing’s Phantom Works group has customized its server software to perform aircraft design tasks that previously required a supercomputer. Western Geco, the world’s largest seismic services company based in Sussex, United Kingdom, is building clusters of Dell PC servers running Linux for the computer-intensive processing required by its research work. Since Linux is rooted in Unix, many of the tools the company used in its Unix environment port to Linux very easily.

The financial services industry has been willing to adopt Linux for mission-critical applications because they are less dependent on proprietary applications and operating systems than other industries. They tend to build more of their own applications in-house and that gives them greater flexibility to implement new technologies. CS First Boston converted a major worldwide financial trading system called Agora to Linux. Agora performs thousands of complex transactions and CS First Boston has been able to consolidate its processing operations from 20 RISC servers to a smaller number of servers with Intel processors. ETRADE Group switched from Sun Microsystems to IBM servers running Linux to house its new Web site so that it did not have to be locked into a hardware vendor because of its operating system. ETRADE can run its programs on Linux and can switch easily to another hardware vendor that supports Linux.

Hardware companies such as IBM, Hewlett-Packard, Dell, Sun, and Compaq are offering versions of their computers pre-loaded with Linux and are spending a significant amount of research dollars to make it easier and more effective to use. Oracle, SAP, Veritas, BEA and other leading software firms are marketing versions of their products that operate on Linux.

The area of greatest success for Linux has been as a server operating system. The International Data Corporation (IDC) calls Linux the fastest growing server operating system, expanding at a compounded annual rate near 30 percent. Linux is rapidly becoming the de facto operating system for server-appliances targeted at small business and home office users who want to easily network a few machines. Its low, $50 per copy price makes it extremely attractive to such users. China recently announced it was adopting Linux as the mainstream operating system for its server computers, and the governments of the United Kingdom and Germany have endorsed Linux.

Linux is also showing promise in software applications embedded in devices such as cell phones or set-top cable TV boxes. Linux is very economical in its use of computing resources, which are very limited in such devices.

One key area where Linux has yet to have an impact is desktop software. Some analysts believe that big corporations will still opt for Microsoft Windows and Microsoft Office because it presents a complete "soup to nuts" set of software tools for PC productivity. However, Microsoft recently changed its Office licensing policy, replacing fees for one-time upgrades with long-term "software maintenance" contracts that make its desktop productivity software even more expensive for businesses to own. Desktop productivity tools that run on Linux, such as Sun’s StarOffice are much less expensive than Office and are becoming more competitive.

To Think About: Should a company select Linux as an operating system for its major business applications? What are the business as well as the technology issues that should be addressed when making that decision?


**TECHNOLOGY**

**C**

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