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Linux Systems Gaining Momentum on Wall Street

The Linux operating system creates a compelling value proposition for securities firms according to a just-released TowerGroup report. Linux offers high performance, scalability and reliability, low cost of ownership, growing support and services from distributors and established technology firms, portability across a range of platforms and an openness lent by its Open Source origins, writes Senior Analyst Dushyant Shahrawat in his report entitled "Wall Street Romances the Penguin: The Growing Popularity of Linux."

Looking at Linux's market share and how it compares with other operating systems in the North American securities market, TowerGroup estimates that Linux is currently deployed on 7 percent of the total servers. Most servers in the securities industry continue to be dominated by Microsoft with Unix coming in as the second most popular deployment option.

TowerGroup believes that over 2002—2005, Linux will continue to make further inroads into the server market in the North American securities industry with Linux servers growing at a compound annual growth rate (CAGR) of 22 percent.

Securities firms are currently deploying Linux in five major ways: workload consolidation, clustering, infrastructure solutions, distributed architecture and via an applications strategy. Furthermore, Linux is now positioned to become a force in the enterprise market for critical business functions like trading and transaction processing in the securities industry, writes Shahrawat.

What is crucial is that unlike the growth of similar operating platforms in the past, the growth of Linux is not directed by a single vendor like Sun Microsystems or Microsoft, but by a silent momentum created by several parties, the millions that contribute to Linux kernel releases, distributors, major hardware and software players (IBM, HP, Oracle, etc.) and finally by end-users that have the most to gain from it.

As an operating system, Linux can provide an alternative to two major platforms: Microsoft's NT and Unix. In the last two years, much of the growth that Linux has achieved has been by replacing Unix servers and some NT servers. In other instances, firms have replaced expensive supercomputers with Linux clusters or consoli-

dated Unix servers on virtual clusters running on a single Linux mainframe.

Because Linux was developed with a keen eye on Unix, the two platforms closely resemble each other across several parameters: performance, reliability, manageability, etc. But when comparing the two operating systems in a broader context—taking into account the overall cost of support, service, and management—and when considering the flexibility that each provides (or denies) a CIO, TowerGroup research says securities firms often find the scales tipping in favor of Linux although it highly depends upon a particular firm's environment.

In the current economic environment, where there is intense pressure to cut costs, CIOs are making technology decisions after seriously pondering parameters, taking a total cost of ownership (TCO) view. Under a TCO analysis, Linux has proved to have a marked advantage over alternative operating platforms in that it has a lower TCO, both in terms of lower hardware and software expense, and in ongoing maintenance and support, writes Shahrawat.

The choice to go with Linux is also closely related to the fact

TOWERGROUP REPORTS

A Linux Sampler

Here are several examples of Linux's adoption in the securities industry:

LINUX IMPLEMENTATION	PROJECT DESCRIPTION
CS First Boston	Deployed Linux on Egenera blade servers to support global order routing architecture, processing an average of 35 million transactions per day
E-Trade	This summer decided to replace Sun Unix boxes with Linux servers to run its new Web site
Morgan Stanley	Estimates indicate one-sixth of systems run Linux; is in the process of completing migration of its North American equity market data distribution platform to Linux
Securities Industry Automation Corp. (Siac)	Migrated its Artmail application, which notifies trade participants about executions, from Sun Sparc to IBM's mainframe running Linux
Salomon Smith Barney	Consolidated workload by replacing Gateway servers with Linux virtual machines running on IBM mainframes

Source: TowerGroup

that it runs on Intel chip architecture. When firms make choices among NT, Linux and Unix, the processing power provided by the underlying chip plays a major factor in the competitive positioning of the various platforms. In the low- and mid-tier server market, securities firms have essentially faced a choice between Microsoft NT, which runs on Intel chip architecture (casually referred to as "Wintel": Windows + Intel), and Unix servers that run on other proprietary chips. As Intel has improved chip performance and vastly lowered the cost/performance ratio over other chips, securities firms have been attracted by the faster performance of the Wintel architecture. But firms have not been comfortable in migrating critical functions like trading and processing on to the NT platform from Unix servers because NT does not have the scalability, reliability and availability that mid-tier and high-end Unix servers possess.

The arrival of Linux running on Intel chips (often referred to as "Lintel": Linux + Intel) and its support by most major Unix server providers has changed the situation considerably. Firms now have the option of choosing Unix servers that run Linux with Intel chips inside (Lintel) offered by firms such as IBM, Fujitsu, HP and now Sun, in addition to the two earlier options of Microsoft NT running on Intel (Wintel) and Sun Unix servers running Solaris. Firms finally have the ability to adopt the faster Intel chip architecture deployed on Linux systems running on Unix servers, so they enjoy the high reliability and scalability they have always wanted.

TowerGroup views Linux as the most successful effort that has emerged from Open Source thus far. The Open Source model is especially relevant for securities firms because they have historically spent vast amounts of money on technology, either by buying it from commercial vendors or by extensively developing proprietary applications when suitable third-party products were unavailable. The Open Source software model offers cheaper alternatives to buying licensing software from traditional vendors like Sun, Microsoft and Oracle, while Linux offers the ability to cut hardware expenses by running it on cheaper machines instead of on servers or mainframes that are more expensive.

Linux provides a compelling argument when considering its high performance, reliability, and stability, all at a much lower cost than most alternatives, and it enables firms to realize greater flexibility in their technology infrastructure by not locking them into a particular vendor's technology. Large bulge bracket brokerage firms recognize that this flexibility can be a major strategic advantage because it allows them to leverage new technology without being unduly restricted by their current IT infrastructure. Linux also provides institutions greater leverage in negotiating prices and service terms with infrastructure vendors and ISVs by giving them a viable alternative to third-party technology.

Financial services firms, and especially securities firms, have long had a reputation of leading the charge in adopting new technologies and riding emerging trends, ahead of other industries. Financial firms have begun aggressively adopting Linux, but heavy Linux implementations are concentrated at large bulge bracket broker-dealers. Mass adoption hasn't happened because most firms have invested vast amounts of money in Unix and NT infrastructure and are loath to write that off.

Shahrawat said securities firms are deploying Linux in sev-

eral major ways. The particular deployment option that a securities firm chooses is a function of its internal IT architecture, business and technological needs, its objective in adopting Linux, and comfort level with the current state of the system and expected growth in the future. Each deployment option has its particular merits and demerits and may include a different combination of the operating system, underlying hardware, integration services, and other tools.

Linux has gained popularity in the last two years among Wall Street brokerage houses, and second-tier brokerage firms, as rising cost pressures and a growing sense of comfort with the operating system have convinced CIOs to adopt it. An interesting feature of its adoption on Wall Street is that it was first introduced into the brokerage environment in the late 1990s mainly by enterprising developers excited about its Open Source origins. These developers had to then convince senior technology managers to try out the operating system, but senior management was quite apprehensive of this immature technology that didn't have the support of large established firms.

By early 2001, however, TowerGroup asserts that brokerage firms became much more comfortable and savvy about Linux and were dealing with one or more of the several firms that provide services like installation, training, support, and consulting around Linux deployment. As a result, the Linux argument today is quite often being made at brokerage firms not by low-level developers but by senior management, who are becoming more convinced about its growing capability. What were once small private firms providing support around Linux are today more established firms with a successful track record. Large firms like IBM and HP are equipping their core hardware platforms with Linux and providing comprehensive service contracts to support the system.

An interesting feature about the adoption of Linux in the securities industry is that large firms seem to have been much more aggressive in adopting it than small and mid-size firms. Large firms like Merrill Lynch and Morgan Stanley have pushed the envelope and are rolling out trading and trade processing applications on Linux while second- and third-tier firms are still only rolling out Linux in smaller, less mission-critical areas.

CSFB has become a poster-child for the growing success of Linux in the securities industry. In early 2002, it decided to migrate its global order routing architecture to three BladeFrame servers (from Egenera) that run Linux. If this test case is successful, the firm intends to migrate its entire enterprise architecture to the BladeFrame Linux architecture. Other areas where the firm is looking to extend the BladeFrame Linux architecture are calculation engines, middleware, and transaction processing systems.

The Securities Industry Automation Corp. (Siac) has moved its Artmail application, which delivers daily activity reports to Wall Street brokers and member firms on their respective buy/sell transactions, to Linux. Artmail was ported over from Sun Sparc servers to an IBM eServer zSeries mainframe running Linux machines.

Merrill Lynch has been very vocal about its support and excitement for Linux in part to send a clear message to ISVs, especially those active in the financial services space, to continue supporting the Linux movement and offering their

applications on it. Morgan Stanley claims to have more than one-sixth of its systems running on Linux and plans to grow it three-fold by 2003, including the migration of its North American equity market-data distribution platform to Linux.

Although these examples involve North American securities firms, Linux is gaining popularity worldwide following the fact that it came out of the Open Source movement, itself a truly global software movement. Italian bank Banca Commerciale Italiana is big on Linux, New Zealand's TSB Bank is migrating to Linux, Banco Mercantil in Venezuela has deployed Linux, and so has Shenzhen Bank in China.

TowerGroup believes that securities firms considering the adoption of Linux must see it as a strategic decision and draw out a three- to five-year plan of how they should approach the system. They must begin by analyzing their current IT infrastructure and what their business and technological priorities are. The current enthusiasm around Linux, combined with the announcements by major brokerage firms of successful Linux deployments as well as aggressive marketing efforts by Linux

distributors and ISVs, creates a compelling environment for securities firms not yet thinking of Linux to quickly make a decision in its favor.

Wall Street's penchant for Linux is driven by an urgent need to explore ways to further reduce IT expenses, and firms have begun exploring how to rationalize and enhance efficiency of their infrastructure. Shahrawat concludes that firms are also dealing with a growing frustration with the cost and quality of commercially available software and a lack of openness of third-party software. As a result, they are considering migrating large parts of their IT infrastructure to Linux to leverage the flexibility it provides, and to gain leverage with hardware and software vendors to negotiate better prices and service terms.

Brokerage firms are deploying Linux in several different ways, with top-tier brokerage firms pushing the envelope the most in creatively implementing it. Mid-tier and smaller brokerage firms have deployed Linux mainly in infrastructure areas, and most are waiting for their ISVs (whose software they use) to begin supporting it.