22 November 2002 File: SIS 1035

Linux Servers: No "Silver Bullet" for Total Cost of Ownership

Server Infrastructure Strategies

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Our research indicates heightened interest in Linux as an alternative operating system (OS) platform for Windows 2000 or Unix. Senior corporate management often is under the impression that Linux is practically free at best, or at least far less expensive than Windows and Unix.

Although the Linux OS itself is nominally free, Linux is only one component of an increasingly complex application infrastructure stack (see Figure 1), which includes server and storage hardware as well as software (e.g., DBMS, middleware, application). Moreover, from a total-cost-of-ownership (TCO) perspective, we believe the overall application costs of integration and ongoing infrastructure management and support far outweigh one-time, upfront hardware and OS software costs.

Nevertheless, Linux growth has been dramatic, with Linux now accounting for roughly 15% of Intel-based server unit shipments. We believe Linux on Intel ("Lintel") has become the de facto Linux platform in corporate IT environments (though Linux adoption in academia has been somewhat different). We expect Linux growth to continue in 2003/04, as corporate IT organizations become more comfortable with Linux (which was clearly not the case just a couple of years ago). Aside from scalability, our research indicates that the two big concerns with Linux have been support and reliability. Recently, a number of important announcements have begun to address both of these areas. Notable was Oracle's announcement not only of support for the Oracle DBMS (Oracle9i Real Application Clusters [RAC]) and applications on Red Hat Linux, but also that it would provide OS-level support. In addition, Veritas, IBM, HP, Dell, and others have announced more comprehensive Linux support. With Oracle RAC providing more than adequate high-availability clustering capabilities, coupled with enterprise-level OS support from major vendors, these user concerns about Linux support and reliability will be addressed by 1H03. Accordingly, we expect Lintel servers to have gained more than 25% overall server market share by 2005/06. Perhaps somewhat ironically, as our META Trend indicates, we believe the cost of software and services that run on top of Linux will dramatically increase (to create sustainable business models) by 2004/05, offsetting perceived Linux TCO savings.

META Trend: With highly distributed n-tier (DBMS, application, Web) server architectures commoditizing during 2002-04, Unix (other than Solaris) will recede to high-end, low-volume, niche-platform status by 2005/06. Windows will increasingly dominate for midtier application servers (2002-04), due to growing ISV reference platform momentum, and be a suitable DBMS server for 90%+ of application requirements. Linux on Intel ("Lintel") will be a successful high-volume Web, technical computing, and appliance server OS, but enterprise application package (2003/04) and DBMS (2005/06) server penetration will be slower. Linux software and services prices will increase to about 10%-20% less than those of Windows by 2004/05.

TCO Equals One-Time Cost Plus Recurring Costs

IT organizations must consider both one-time, upfront costs and recurring or ongoing costs when determining TCO. Comparing Lintel with Windows on Intel ("Wintel"), we believe many of the infrastructure costs are actually the same. For example, server and storage hardware costs will be identical for comparably configured Intel systems. In addition, applications licensed on a per-CPU or per-user basis will also have the same cost. Our research indicates that Lintel hardware often is perceived as being less expensive than Wintel and as providing better performance, yet we believe most of this difference is a result of comparing older technology Wintel boxes — not necessarily newer Wintel servers — with newer technology Lintel systems.

The cost differences are most dramatic when comparing Lintel against Unix/RISC systems. However, true "apples to apples" comparisons are rare — it is often an "old" versus "new" comparison. In addition, vendors sometimes overconfigure Unix

systems, which can provide far more scalability headroom (>32 CPUs) than Linux boxes (typically 1-2 CPUs, rarely 4+); even Windows scalability is well proven in the 4-8 CPU range. Linux systems typically are used for smaller Web and other Web infrastructure servers. One notable exception is their use for replicated site servers with thousands of potential locations. However, in that case, the role of Linux is actually more like that of an appliance server, given the software for more customized application and remote management than for general-purpose environments.

Regarding cost differences at the OS layer, Windows or Unix costs a few hundred dollars more per server than a Linux distribution (Red Hat, SuSE). For example, Red Hat's Advanced Server edition costs about $800-$2,500 per year (annual subscription license), depending on support service levels. Microsoft's Windows 2000 Advanced Server edition costs about $4,000 upfront, and support costs are separate. We do not believe it is appropriate to compare basic Linux distributions, which cost less than $100, against Microsoft's Advanced Server edition. However, for low-end systems, Microsoft's basic Windows 2000 Server edition costs about $1,000-$1,200 (depending on the number of client access licenses).

More importantly, at the DBMS layer, Oracle and DB2 cost more than SQL Server, which is available only on Windows and which in turn costs far more than one of the "free" open source DBMSs such as MySQL. For example, standard editions of Oracle and DB2 cost about $15,000 and $7,500, respectively; Microsoft SQL Server is priced at $5,000 (see SIS Practice 7). Because most IT organizations will opt for either Oracle or DB2, lack of a SQL Server option on Linux can alone create a $10K upfront DBMS software cost difference.

In terms of recurring costs, maintenance, support, and systems management are large components. Our research indicates that Linux server support-centric costs will be no different then any other Unix platform (on a platform basis, about equal to Windows — we note that this is not the case with client-level Linux). The requirements, service-level issues, and operational processes are exactly the same. Moreover, vendors are adding Linux support to management tools, so the imbalance in tools is narrowing. Finally, three-year warranties are standard on most current Intel servers, whether running Windows or Linux.

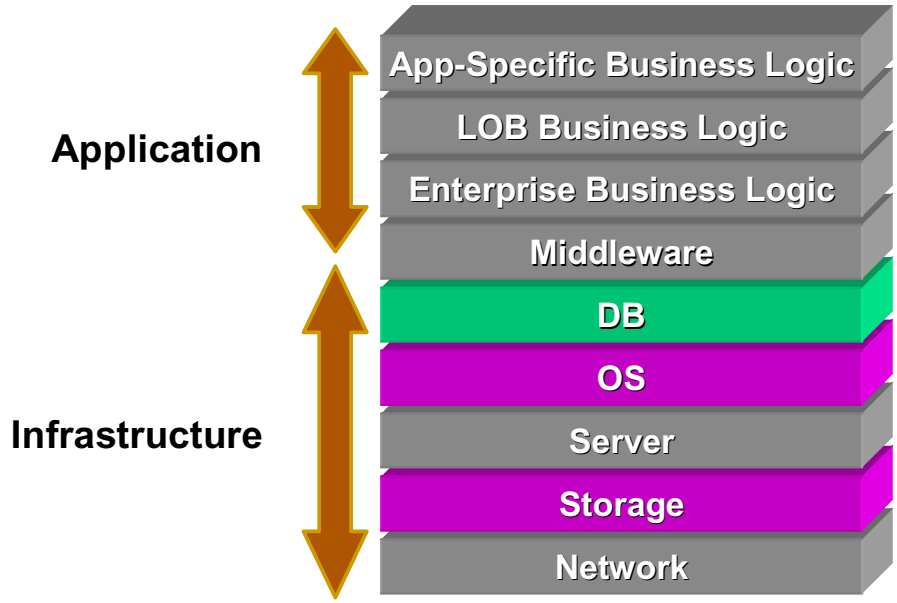
For the long term, we believe Linux is a much larger threat to Unix than it is to Windows (notwithstanding Microsoft's recent licensing changes). Current Windows users generally are not favorably predisposed to Unix, and Linux is often viewed as just another "flavor" of Unix. In Linux file and print server environments, we believe lack of consistent and comprehensive tools for user management will increase end-user administrative costs. Linux is still immature for file and print, and it lacks the huge installed base that is required to challenge Windows.

Bottom Line

Most perceived cost savings for Linux are due to upfront Intel versus RISC hardware, or DBMS cost differences. Because Linux support costs often are higher, Linux does not significantly reduce application infrastructure total cost of ownership.

Business Impact: When organizations evaluate total cost of ownership, ongoing or recurring costs must be considered in addition to one-time, upfront costs.

Figure 1 — Application Infrastructure Layers



LOB — Line of Business
DB — Database
OS — Operating System

Source: META Group