

Inside the New Computer Industry[®]

Hardware & Software Platforms: Embedded to Supercomputer

Andrew Allison, Editor

Thirteen Years

This issue brings to an end 13 years of publishing this newsletter. During this period there have been enormous changes not just in technology but in the industry structure. Thirteen years ago, for example, Sun was a \$1 billion-per-year workstation vendor, Digital Equipment ruled what was then called the minicomputer market, and IBM was still the undisputed champion of the overall industry. Since then, RISC technology and UNIX have driven performance and price/performance improvements at rates equal to or, in the case of price/performance, greater than predicted by the famous, but typically misquoted, Moore's Law and completely reshaped the market.

In addition to dominating processor (including IA-32) design, RISC technology, in conjunction with UNIX, propelled HP and Sun to prominence in the server market, while the WiNTel platform did the same for Compaq and, later, Dell. While all four companies at one time or another had a shot at overtaking IBM as the overall server market leader, I believe that opportunity to have now passed.

Digital's refusal to get behind UNIX (a mistake which Sun has repeated with respect to open source software) did it in; HP's dreadful mishandling of the UNIX server business it once dominated, and seeming inability to hold onto its IA-based market, seem to be doing the same to this once great company; and Compaq appears to be getting squeezed between Dell in the cost-sensitive IA space and a resurgent IBM in the broader market. All of the other computer companies that existed 13 years ago are either gone or shadows of their former selves. The rise of Sun and Dell is an object lesson in the failure to recognize, and respond to, market shifts. The success of both was at least as much a

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result of the negligence of their competitors as of their own capabilities.

Perhaps the most surprising story of the past decade has been the decline and resuscitation of IBM. The company was slow to recognize the changes occurring in the marketplace and suffered badly as a result but now seems well on the way to recovery. Amazingly for a company of its size, IBM has completely reinvented itself, making a whole-hearted commitment to open industry standards and interoperability. There's absolutely no question in my mind that this has been spliced into the company's DNA. Other significant changes in the IBM corporate culture include a true recognition of the value of the partner channel.

No other IT vendor combines the breadth and depth of server, software, and support capabilities, underlying technological underpinning and commitment to interoperable solutions and services offered by IBM. The ability to match a platform to the requirements of any application or service enables the company to offer the lowest total life-cycle cost for any IT requirement. IBM's value proposition is gaining traction in the marketplace,

and I predict that the company will gain significant market share this year and solidify its position as the world's leading supplier not just of IT products and services but of servers. According to industry research, Sun briefly overtook IBM in overall server revenues in the fourth quarter of last year before falling back to second place last quarter. The fourth quarter of 2000 could prove to have been Sun's apogee.

What of the future? The real challenge of IBM's resurrection is to Intel and Microsoft. Intel needs to forward integrate into the solutions and services business in order to maintain historic growth rates and margins, and will run into IBM everywhere it goes. Microsoft, of course, is threatened by the open source phenomenon upon which IBM is betting its future. Although it will take a couple of years for the dust to settle, it's clear that the open source battle is over. Several major users of business-critical operating environments, notably in the financial services business, have figured out the benefits (it's estimated that 80 percent of today's open source software programmers are getting paid to do it by their employers, many of them in the Fortune 500). In addition, the emerging trend toward eliminating general purpose processors and operating systems from at least some classes of application server referred to in last April's editorial could significantly impact WinTel server volumes. This, and the dense server phenomenon, will provide opportunities for the fleet of foot to make inroads into the server market.

Then there's the question of how the battle between Solaris, UnixWare, AIX L, Linux, and NT for the IA platforms will play out. There are, of course, two IA markets. AIX L is not a factor in the IA-32 market, the much-anticipated Foster implementation of which could propel the architecture into the high-end, business-critical server market. With UnixWare fading fast, Solaris has an opportunity to entrench itself in the IA-32 space before the capabilities of Linux and NT are brought up to enterprise-class standards. Foster is, incidentally, Intel's best hope for keeping AMD out of the server

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market. The fact that Intel persists in viewing Solaris-on-Intel as a competitive threat, rather than as a way to increase IA-32 server market share, is also a problem.

Things are more complicated in the IA-64 space. With the initial implementation of the IA-64 architecture a couple of years behind schedule and Microsoft, despite this delay, having once again failed to deliver the operating system needed to take advantage of a new Intel architecture, it's beginning to look as though we won't see truly competitive IA-64 systems until McKinley-based versions come to market a year or so from now. The challenge for Intel today is to ensure that there is a broadly based, 64-bit application stack available for McKinley-based systems when they show up (assuming, of course, that IA-64 lives up to its billing).

Given that there are no 64-bit Windows applications, the only logical way to achieve this is to promote the porting of applications to the three UNIX implementations available for IA-64, namely AIX L, HP-UX, and Solaris. It would be in Intel's interests to "encourage" (by way of the extent of the support it offers) the three proprietary UNIX implementation vendors to make their systems as interoperable as possible; there's very little incentive to port an application that's currently running on a proprietary UNIX platform to another proprietary platform when, in a couple of years, you'll be able to port to Linux.

The Intel/Microsoft hegemony seems secure in the commercial client space; there's just too much application deadweight to make a change. The best chance for breaking this stranglehold is the (Linux-

based) thin client. The situation in the consumer space is more fluid. The Internet appliance market is, I believe, lost to Microsoft unless it replays the IE scenario and gives away the OS in order to capture the applications. Even under this scenario, the advantages of embedded Linux are compelling. The consumer PC market is more problematic. While there's no question that Microsoft owns today's application environment, the needs being served are evolving. The opportunity to replace Microsoft applications (including IE) will increase to the extent that the PC becomes primarily an Internet access (surfing and e-mail) device.

As this was being written, there was considerable angst within the industry and the financial markets as to the future of the IT business. This is misplaced. The key trend in the IT market today is the shift from point products to infrastructure, and a less than casual reading of the tea leaves will demonstrate that the networked IT infrastructure is less than ten percent, and perhaps as little as five percent built out. There's enormous opportunity in both the server and the, greatly oversold, communications market (what, pray tell, is going to carry the IP traffic which will be generated by all those servers?). UNIX servers in particular will be in demand for business-critical applications until Linux gets up to speed, by which time it will be sufficiently well entrenched in the enterprise market that it will live on for decades.

