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Is Oracle Really Entering the Server Hardware Business?

Tony Iams, SVP and Senior Analyst, System Software Research

In the aftermath of the announcement that Oracle will acquire Sun Microsystems for US\$ 7.4 billion, one of the main questions to arise is what the future holds for Sun's \$8 billion hardware business. Oracle is a software company, and in the announcement, it made clear that it bought Sun primarily to obtain Sun's software, which includes Java and Solaris. Some clues may lie in Oracle's April 20th statements.

Risks vs. Benefits for Oracle

The risks for Oracle to enter the hardware market are clear. Most of the major server vendors in the industry support Oracle's database software to some extent, and if Oracle now promotes its own hardware platform based on Sun's technology, other hardware vendors may become increasingly hesitant to encourage their customers to deploy Oracle's software offerings, for fear of drawing their attention to Oracle's competing hardware. On the other hand, offering an end-to-end, vertically integrated platform including hardware and software offers Oracle an opportunity to achieve a stronger bond with its customers, and higher profits, than ever before.

For now, Oracle pledges to continue growing Sun's hardware business, and to protect the investment of Sun's existing customers. However, one clue to its intentions lay in an FAQ that Oracle published after the announcement, which included the phrase "Oracle also intends to focus the server and

storage businesses on our common enterprise customers." Today, that set of customers clearly represents the users of Sun's SPARC systems. Sun already outsources the manufacturing, assembly, and much of the support of its SPARC servers, and Oracle must have concluded that the server business can be made profitable.

While Sun has struggled to achieve profitability with its platforms for some time, IBM has proven that proprietary platforms can be highly profitable, as long as sufficient software and services are attached. Oracle offers plenty of software and services that it can wrap around SPARC servers, and it could thus well succeed where Sun has not. As a result, Oracle's acquisition could mean a new lease on life for the SPARC architecture.

At minimum, Oracle can optimize its software to take full advantage of the multicore/multithread processor architecture in Sun's Chip Multithreading (CMT) processors, as well as unique features in the Solaris operating system. The combination of a specially tuned Oracle database and middleware, advanced multithreading capabilities in Solaris (assisted by Sun's unique DTrace performance tool), and large numbers of cores in the next-generation CMT processor (code-named "Rock"), could finally yield the leading-edge performance gains that Sun has long promised for its servers.

Another potential development is that Oracle now has the opportunity to improve

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[Oracle . . . continued from page 1]

the Total Cost of Acquisition (TCA) of its hardware/software solution by adjusting the scaling factor for multicore pricing on its own SPARC and CoolThreads processors relative to competing processors such as IBM POWER. Oracle could favor SPARC hardware with a lower cost-per-core factor to counter the advantages of competitors such as IBM's POWER6 in terms of performance per core. Oracle would then encourage the deployment of its servers by treating them as "throughput" servers rather than performance servers, further reducing the net core charge basis.

On the other hand, Sun's x86 systems business overlaps much more with the business of Oracle's key partners, including HP and Dell, and it represents less than 13% of Sun's hardware business. Oracle may be much more hesitant to promote these systems, and it will likely continue to encourage other x86 vendors to adopt the x86 versions of Solaris and OpenSolaris.

A phrase in the press release revealed Oracle's intentions for Sun's storage business: "Oracle will be the only company that can engineer an integrated system – applications to disk – where all the pieces fit and work together so customers do not have to do it themselves." The use of the term "disk," rather than "file system," implies that Oracle will continue to promote Sun's StorageTek hardware, and its solution stack will not end with the ZFS file system in Solaris.

Oracle's acquisition of Solaris raises questions about the strategic role that Linux will play in the future. Only recently, at the Linux on HPC conference, Oracle stated that Linux is the standard operating system for its development teams, and that all the software packages it acquires are re-hosted on Linux. In today's announcement, Oracle stated that Solaris is the "best UNIX," and that Solaris for SPARC and OpenSolaris would continue to be enhanced. Oracle also stated that the leading deployment platform for its products

is Solaris on SPARC, and that it expects to optimize the Oracle database for some of the unique, high-end features of Solaris. In the announcement FAQ, Oracle stated that its position with regard to Linux will be unchanged. However, it seems logical that Solaris will become Oracle's preferred operating system instead of Linux. This realignment by one of the leading Linux supporters,

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combined with other fallout from Oracle's integration of Solaris – which itself had been increasingly supported by HP, IBM, and Dell – could ultimately lead to a tectonic shift in the Linux industry, possibly resulting in the acquisition of Red Hat and Novell by some of these vendors.

Virtualization's Role in Changing the Competitive Landscape

The virtualization of datacenters is causing significant changes in the industry. Two new contenders, Oracle and Cisco, are entering

the server business, and in both cases, the upstarts are exploiting their strength in software as a wedge into the market (while Cisco sells switch hardware, much of its functionality derives from the iOS software embedded within).

For twenty years, the IT industry has gravitated toward disaggregation, whereby enterprise IT solutions were typically assembled from collections of industry-standard components. Now, the industry is entering a phase in which the server side of IT infrastructure is increasingly delivered in proprietary, vertically integrated forms (of which cloud computing is perhaps the ultimate manifestation). Customers who deploy servers on their own premises expect solutions consisting of differentiated software that is integrated directly with the hardware platform.

The IDEAS Bottom Line

With the acquisition of Sun, Oracle expects to deliver such a solution at the high end – consisting of the Oracle database, SPARC hardware, and the Solaris operating system – that it can position as an end-to-end, integrated alternative to IBM's mainframes with z/OS and DB2. For now, the margins at the upper levels of the server market will be most appealing to Oracle as it seeks new ways to expand its business. Sun's assets targeting the lower end of the market, including its commodity x86 hardware and even the MySQL database, are not yet likely to represent a high priority for Oracle. Its ownership of these assets will serve defensive purposes in the short term, keeping them away from the hands of competitors.

Regardless of its ultimate plans for Sun's server products, Oracle's entry into the server market will change the balance of power in the IT industry, and it should not be taken lightly. ■

New Xeon 5500 Nehalem Servers Announced

Andrew Dun, Senior Analyst, Server Information Services

At the end of March Intel announced a new generation of two-socket server processors, which in turn inspired server manufacturers to announce all new products based on the new technology. Around 30 new servers have been added to CPSystems with the new chips, including new rack, blade and tower servers from Dell, HP and Fujitsu as well as new rack and blade servers from IBM and Sun.

New Xeon Processors

The new Xeon 5500 series processors are based on the “Nehalem” architecture, which first debuted in high-end desktops as the Core i7 chip late in 2008. The new processors don’t run at clock speeds that are any faster than the previous generation 5400 series chips; however, due to a number of significant architectural advancements, they offer performance improvements (up to 2.25x for enterprise applications according to Intel) without any increase in power draw or heat dissipation. In fact, Intel claims that the 5500 series Xeon has reduced idle power draw by 50% compared to the 5400 series through better power management. With the exception of the dual-core entry-level E5502 variant, the 5500 series processors are quad core with up to eight processor cores per system. In addition, higher-end models have HyperThreading enabled for up to 16 threads per server.

One of the key architectural changes that has enabled this performance boost is what Intel is calling its QuickPath Technology. This combination of on-board memory controllers and a new system interconnect replaces the old Front Side Bus that has been the backbone of Intel systems for years. The result is reduced latency and

improved bandwidth – up to 3.5x improvement over the previous generation on bandwidth intensive workloads according to Intel. The new memory controllers also support faster DDR3 memory. By adopting the QuickPath Interconnect, Intel has effectively countered a competitive advantage that AMD held by using HyperTransport in Opteron processors.

While the tenuous global financial situation has shifted focus away from ecological concerns in recent times, the need to vastly improve energy use and reduce emissions remains drastically important. The new Xeon 5500 series processors include technology designed to improve power management without compromising system performance. So called “Intel Intelligent Power Technology” has two key components:

- » *Automated Power Gates*, which reduce an idle processor core’s power usage to near zero without affecting the performance of other cores on the same processor chip
- » *Automated Low-Power States*, which automatically place processor and memory

components into the lowest available power states that meet workload requirements.

Power management software includes Intel Dynamic Power Node Manager, which monitors and manages power and thermal load on an individual server basis, and Intel Dynamic Power Datacenter Manager, which extends that same functionality over an entire data-center.

A key component of the Xeon 5500 platform is the new 5520 chipset. Along with the new QuickPath Interconnect, the 5520 chipset improves I/O performance with up to 42 PCI Express lanes, or 36 PCI Express 2.0 lanes. Also announced was the 82599 10 Gigabit Ethernet Controller.

With up to 16 threads per server and improved memory support, Xeon 5500 servers are likely to be a popular platform for virtualization implementation. Accordingly, Intel has made some improvements to Intel Virtualization Technology (Intel VT-x). Extended Page Table manage-

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Table 1. Summary of Xeon 5500 Series Offerings

Model	Clock Speed	Cores	Threads	L3 Cache	Power (TDP)
E5502	1.86 GHz	2	2	4 MB	80 W
E5504	2 GHz	4	4	4 MB	80 W
E5506	2.13 GHz	4	4	4 MB	80 W
L5506	2.13 GHz	4	4	4 MB	60 W
E5520	2.26 GHz	4	8	8 MB	80 W
L5520	2.26 GHz	4	8	8 MB	60 W
E5530	2.4 GHz	4	8	8 MB	80 W
E5540	2.53 GHz	4	8	8 MB	80 W
X5550	2.66 GHz	4	8	8 MB	95 W
X5560	2.8 GHz	4	8	8 MB	95 W
X5570	2.93 GHz	4	8	8 MB	95 W
W5580	3.2 GHz	4	8	8 MB	130 W

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[Nehalem . . . continued from page 3]

ment is designed to improve access to hardware for guest operating systems, reducing the overhead of virtualization software caused by page table translation. In the 5520 chipset, Intel Virtualization Technology for Directed I/O (Intel VT-d) can give designated virtual machines their own dedicated I/O devices, further reducing the burden on virtualization management software.

Introducing this new processor has not been a simple matter of releasing a new chip to plug into existing servers. Intel has ushered in an entirely new system platform with new interconnect, chipset, and memory technology. Hence, to accommodate the new processors, server manufacturers had to introduce completely new models in order to take advantage of the features available. A summary of some of the major new products, as they appear in Competitive Profiles, appears below.

Five New Dell Servers

Dell has introduced five new PowerEdge servers that all use the new Xeon 5500 series processors. Announced were two rack servers, two blade servers, and a tower server:

- » PowerEdge T610 – tower server
- » PowerEdge R610 – 1U rackmount
- » PowerEdge R710 – 2U rackmount
- » PowerEdge M610 – half-height blade
- » PowerEdge M710 – full-height blade

Eleven New HP Servers

HP has taken this opportunity to announce a major generation refresh of its ProLiant Industry Standard Server (ISS) family with the introduction of 11 new ProLiant G6 models. The new models are comprised of three blade servers, five rack servers, and three tower servers:

- » ProLiant ML150 G6 – tower server
- » ProLiant ML350 G6 – tower server
- » ProLiant ML370 G6 – tower server
- » ProLiant DL160 G6 – 1U rackmount
- » ProLiant DL180 G6 – 2U rackmount r
- » ProLiant DL360 G6 – 1U rackmount r
- » ProLiant DL370 G6 – 4U rackmount
- » ProLiant DL380 G6 – 2U rackmount
- » ProLiant BL280c G6 – half-height blade
- » ProLiant BL460c G6 – half-height blade
- » ProLiant BL490c G6 – half-height blade

Four New IBM Servers

IBM has announced four new servers supporting the Xeon 5500 platform – two rackmount servers, one blade server, and a new model in the iDataPlex range of super dense rackmount servers.

- » System x3550 M2 – a 1U rackmount
- » System x3650 M2 – a 2U rackmount server (available April 30)
- » BladeCenter HS22 – a single-width blade
- » iDataPlex dx360 M2 – iDataPlex node

Six new Sun servers

On April 14, Sun announced four new rack servers and two new blade servers, as well as enhancements to the Solaris operating system that enable it to better leverage the new technology.

- » Fire X2270 – 1U rackmount
- » Fire X4170 – 1U rackmount
- » Fire X4270 – 2U rackmount
- » Fire X4275 – 2U rackmount
- » Blade X6270 – blade server
- » Blade X6275 – dual-node blade

Three New Fujitsu Servers

On April 1 Fujitsu announced a tower server and two new rackmount servers.

- » PRIMERGY TX300 S5 – tower server
- » PRIMERGY RX200 S5 – 1U rackmount
- » PRIMERGY RX300 S5 – 2U rackmount ■



BLOG BITES (From IDEAS Insights: <http://www.ideasint.blogs.com>)

The decision to focus on Intel x86 is interesting given that Fujitsu has an existing sizeable stake in the SPARC architecture . . .

From "Fujitsu Sharpens Its Identity"

Gary Burgess | April 2, 2009

<http://ideasint.blogs.com/ideasinsights/2009/04/fujitsu-sharpens-its-identity.html>

[fujitsu-sharpens-its-identity.html](http://ideasint.blogs.com/ideasinsights/2009/04/fujitsu-sharpens-its-identity.html)



In describing its goals for the Unified Computing System, Cisco portrays a vision in which servers become 'fluid objects in the network.'

From "When the Network Wags the Server"

Tony Iams | March 18, 2008

<http://ideasint.blogs.com/ideasinsights/2009/03/when-the-network-wags-the-server.html>

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