

# Sun Blade System 6000

## A Computing Platform for All Seasons

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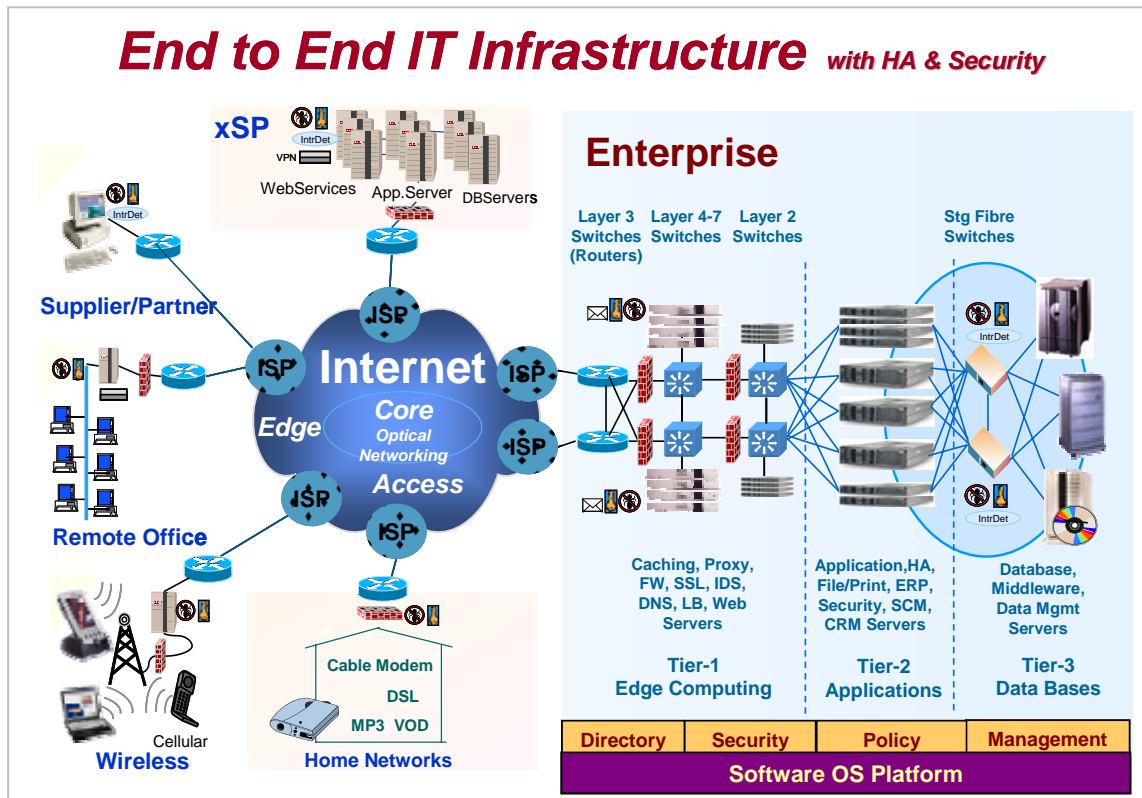
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# Sun's New Blade System 6000

## A computing platform for all seasons (er ... Applications)

Despite all their potential in the server space, blades have not grown anywhere near as fast as earlier expected mainly due to two reasons – the lack of interoperability between products from different vendors at the physical and even API levels and the impact from rapid rise of virtualization in increasing the utilization of existing underutilized servers hitherto running only one application per server.

While Dell, Sun Microsystems, Fujitsu, NEC and a number of smaller players failed at first attempt to crack the blade server market due to poor product positioning by addressing only the entry level web server market using light weight microprocessors like Pentium-3 and focusing on density (3U form factor and number of blades per chassis), IBM, and to a lesser extent HP, positioned their products for multiple tiers including Application and Database Servers (see diagram).



Now with the Blade System 6000 (code name "Constellation") launch, Sun is eyeing to challenge the dominance of IBM and HP who together command 75% of total blade servers market.

## Design Philosophy

Designed under the guidance of Andy Bechtolsheim, an industry luminary and co-founder at Sun, Blade System 6000 helps Sun to truly embrace Open Systems Architecture. Leveraging industry standard elements such as UltraSparc, AMD and Intel multicore microprocessors; three operating systems - Solaris, Windows and Linux ; large standard memory up to 64 GB, industry standard PCI-Express I/O; 10Gb Ethernet network fabric; open management framework - an open management facility to allow fast and easy integration with popular and already available blade or rack mount management tools from many vendors; customer oriented self-help features such as hot-swap modules, front-loading disk drives and many other innovative features such as optimized cooling and airflow and technology support for next five years.

### Scalability using Off-the-Shelf Components

Sun Blade 6000's architecture built on openness to leverage industry standard infrastructure components and scalability for long-term investment protection has the potential for Sun Blades to come from behind to challenge the blade server leaders of today.

Sun pumped up the memory capability of its Blade Server 6000 using 16 DIMMs allowing customers the flexibility to use off-the-shelf 1Gb inexpensive memory chips or maximize capacity to 64 GB using 4Gb, albeit expensive, chips. Sun chose to address the memory dilemma for two reasons: First, multicore processors require more main memory to run in a balanced way. Second, server virtualization hypervisors need lots of main memory to run efficiently. Since many blade servers are also being virtualized, future demands large main memory on each blade server. All this enables the Sun Blade 6000 Modular System to run virtually any enterprise application.

The use of industry standard PCI-Express I/O adapters will allow customers to install or replace an I/O module without interfering with systems operation and the choice of dual and quad core processors maximizes customer investment by supporting future x86 microprocessors with four and eight cores.

Creating highly dense blade servers creates a side effect: severe power and cooling issues in the existing air-cooled data centers which were not designed to handle such hot spots created by dense blade servers. So instead of high density as the major design guide, Sun strove for longevity of design, scalability, use of industry standard off-the shelf components and performance as the key metrics to design for a future proof machine which has the longevity to accommodate newer emerging technologies in processors to futures proof the architecture .

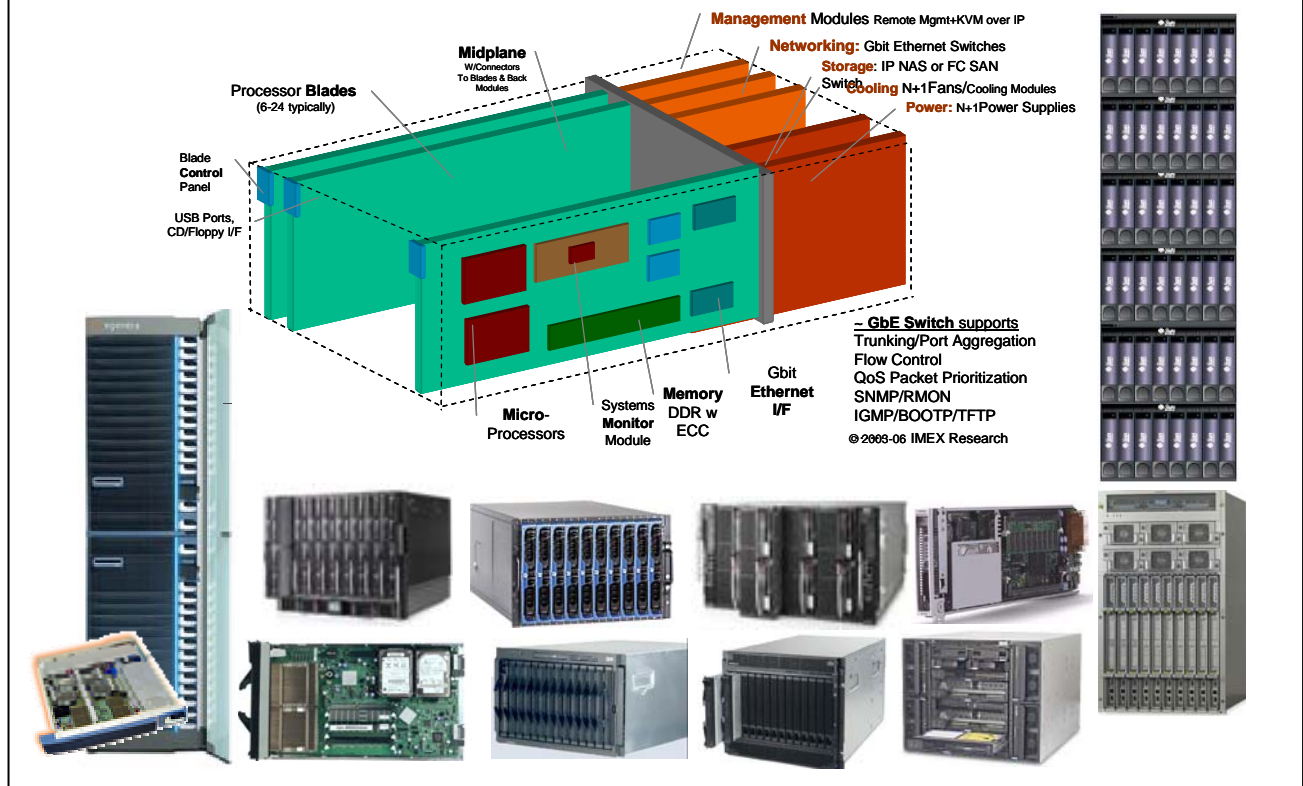
Sun's Blade 8000 box, initially created using AMD's dual-core Rev E Opteron chips with four sockets on each blade, was a large 19U behemoth by blade server standards whereas the recent Blade 6000 machines are based on a two-socket blade design and fit in a more compact 10U chassis.

## Sun follows SIVA®

### Standardization, Integration, Virtualization and Automation

A blade server is essentially a physical structure for compact motherboard modules or "blades" which have their own processors, memory, storage and I/O connections, but share physical space, power supply, cooling and other resources with fellow blades. Blade servers—chassis with multiple thin, modular circuit boards, or blades, which can be dedicated to single applications—are designed to offer more processing power using less rack space. Each blade can include one or more processors, memory, storage, or network connections. However, they share the chassis' common power and air-supply resources. © 2007 IMEX Research

# Blade Infrastructure: Local Area Grid (LAG®)



Sun introduced the Sun Blade 6000 Modular System, with up to double the memory and double the I/O capacity of competing blades and rackmount servers.

Sun Blade System 6000 chassis supports up to 10 blade servers. A choice of three new blade servers: - Sun UltraSparc TI "Niagara" processor based blade, Intel Xeon quad-core processor based blade and an AMD Opteron processors based blade. Because the system uses PCI Express to connect the blades, they support hot-plugging and address problems involved in mixing and matching technologies. Support for three OS – Solaris 10, Windows 2003 and Linux form the heart of Sun Blade System 6000. A fully loaded rack with four 6000 chassis modules could boast 320 CPU cores, 2.5 TB of memory, and 5 Tb/sec of usable I/O throughput.

With the three fastest processor platforms, three operating systems, high memory and I/O bandwidth, Sun is providing its users with a system that allows customers to upgrade to virtualized blade platforms without the expense or technical compromises presented by some of its competitors.

## A universal deployment platform

Sun built one chassis for longevity while addressing requirements of various applications through flexibility to use various types of blades with characteristics to match the workload requirements whereas competitive products have the rigidity having to forklift to different chassis to accommodate different workloads.

Sun has managed to up the memory density on the Opteron and Xeon blades to a maximum of 64 Gbytes. In These improvements in memory and I/O density will keep customers who are planning to deploy VZ on these blades for virtualized environments. By adopting true industry standards, once customers see the value of sun's blade architecture they will drive up the adoption of Sun 6000. Sun has not only moved to the "brave new world of open systems" but in the process Sun has beaten Dell, HP, and IBM in the use of PCI Express to differentiate its offering.

Some customers see IT as a cost. To them new modular blade computing platform is a great way to reduce costs. But the much more interesting customers are those that see IT as a competitive weapon.

## Targeted Markets

BladeSystem 6000 is aimed squarely at the mainstream volume server market, a fully functional replacement of what you might expect from a rackmount server.

In the near term, Sun is not expected to steal customers from competitors with the new system. Instead, the company is more likely to sway their own customers who have been hesitant to buy the company's previous blade offerings. IMEX expects sales of the Sun Blade 6000 to come initially from replacing the Sun Rack Servers followed by incursions into competitive territories at the expense of IBM and HP blade servers. Overall Sun Blades will have the effect of helping grow the total blade server market.

Sun has smartly differentiated its new blade system through the Sun Refresh Service program, a subscription-based offering that provides a refresh of blade system 6000 hardware, including updated processors and memory, at 42 months after the initial purchase. The refresh falls right in the sweet spot of most enterprises' normal sever refresh cycle (3-5 years). This has the effect of locking customers into Sun Blades and peripherals for a long time.

## Solutions by Applications

The blade system is being positioned for virtualization and high performance computing (HPC), it as the ideal architecture for VMware, from both a memory and I/O capacity perspective. Data centers housing large databases will also benefit from Sun's Blade 6000 Modular System.

### Virtualization & Consolidation

By consolidating your Web or business application servers on Sun Blade systems, you can gain greater throughput in less space, reduce the number of systems, and improve the performance, management, and security of your IT infrastructure at up to half the cost of alternative solutions.

### OLTP/Business Computing & Databases

Enterprise business applications and databases require high processing and throughput capability, large memory footprint, and robustness. Sun Blade systems deliver fast performance, up to double the memory and I/O, and more serviceability than traditional server form factors.

### IT & Web Infrastructure

Sun Blade systems are the ideal platform for web 2.0 infrastructure. They are easy to deploy, easy to scale, and deliver fast performance with high efficiency. Sun's optimized AMP stack can provide excellent system performance.

### Web 2.0/Data Streaming Broadband

For the emerging Web 2.0 demands on broadband and multiple streams, configuring Sun Blade 6000 for video serving is easy using Virtualization

### Application Development Consolidation

For enterprises with large software application development infrastructure, Sun Blade Virtualized Developer Solution helps consolidate and streamline application development and system utilization.

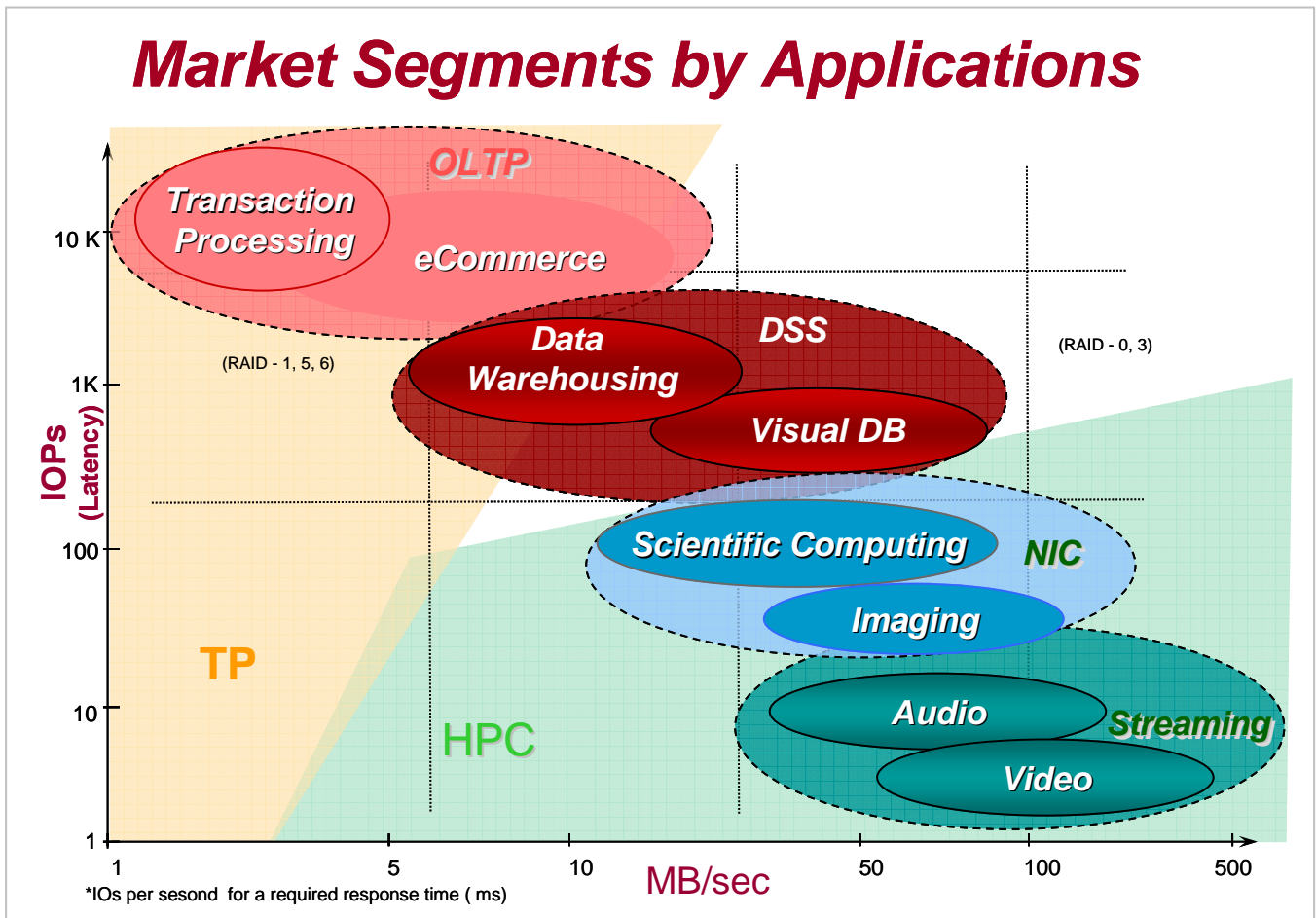
### High Performance Computing

High performance computing applications require the fastest performance, massive scalability and high efficiency. Sun Blade systems are essentially built for high performance computing. Find out how Sun Blade systems can help solve highly complex problems, perform business critical analysis, or run computationally intensive workloads faster and more efficiently.

## Market Positioning

Sun has yet to make a dent in the blade server market. In the first quarter of this year, HP easily led the market in terms of revenue with a 40.9% share, according to IDC. The computer maker increased revenue year over year by 49.2%, gaining 3.3 points of market share over the first quarter of 2006. IBM was second in the market with a 35.2% share.

HP also led the overall server market by revenue with a 29.2% share, followed by IBM, 28.9%; and Sun, 10.9%, according to IDC. The market overall grew 4.9% in the quarter to \$12.4 billion. IDC's Quarterly Server Tracker



released last month ranks HP the top vendor for blade server revenue and units, with 45.1% unit share and 40.9% revenue share. Sun had only 0.2% unit share and revenue share was 0.6%.

Sun Microsystems, the company's server revenue grew 15 percent in 2006, which jolted the company into a tie for third place among the top five vendors, according to the latest IDC study.

The survey, which IDC released on Feb. 26, showed Sun increasing its server revenue 24.4 percent in the fourth quarter of 2006 compared with the same time the previous year. That quarter helped Sun collect \$5.6 billion in server revenue for the whole year, which represented 10.8 percent of the marketplace.

Hewlett-Packard overtook IBM for the No. 1 spot in the blade market during the fourth quarter of 2006. However, for the year, IBM remained in the top spot with 40 percent of the blade market's revenue compared with 37.4 percent for HP.

For the whole year, server revenue grew 2 percent to \$52.3 billion, while shipments increased 5.9 percent to a total of 7.5 million units. In just the fourth quarter, revenue increased 5.2 percent but shipments were flat.

A closer look at the numbers showed that volume server system shipments grew only 2.1 percent in the fourth quarter, but sales of midrange and high-end server sales increased 5.4 and 11.5 percent respectively.

This trend seems to show that enterprises are no longer just looking at the server with the lowest price. IT departments are more concerned about how the purchase of each server fits into costs associated with the data center, the ability to deploy virtualization software on that system and what range of services vendors can provide for the hardware.

More customers are concerned about the total cost of ownership, vendors out there that are doing well are the ones that can offer a total integrated solution, and we saw that trend in the last half of 2006 and I think we'll see it continuing into the next couple of quarters."

The companies that are able to deliver those solutions, such as HP, Sun and IBM, were able to show growth in both the fourth quarter and for the 2006 as a whole.

Sun's improving financial picture during the second half of 2006 comes from its "Try and Buy" program, which helps get its hardware into the data center, and the growing use of its Solaris operating system.

In the fourth quarter, IBM held the top server vendor spot with \$5.8 billion revenue and 37.9 percent of the market. In the same quarter, HP was second with \$4 billion in revenue and 26.8 percent of the market. Sun, Dell and Fujitsu/Fujitsu-Siemens rounded out the top five vendors.

For the year, IBM held the top spot with \$17.1 billion in server revenue and 32.8 percent of the market. HP took the second spot with \$14.2 billion in revenue and 27.2 percent of the market. Sun and Dell were virtually tied for third place, while Fujitsu/Fujitsu-Siemens rounded out the top five.

In the x86 market, HP was the top vendor in the fourth quarter, while Dell and IBM tied for second. HP also finished first in the blade market with 41.9 percent of the market, compared with IBM's 37 percent.

For both the quarter and the year, IBM was helped by its System x offering, but more importantly by its midrange and high-end System z and System p products.

Linux server revenue grew 15.3 percent in the fourth quarter compared with the fourth quarter of 2005. However, Linux server shipments decreased 0.8 percent for the year due to consolidation in the data center.

Microsoft Windows servers grew both in terms of revenue and shipments in 2006 compared to 2005. Unix servers also experienced revenue growth year-over-year.

## GG Report

The number of server shipments worldwide grew nearly 9 percent in 2006, with Hewlett-Packard leading with 27.5 percent of the market, according to the latest study by Gartner.

IBM led the annual survey in terms of revenue, with \$16.9 billion worth of server sales in 2006. That number represented a 1.7 percent increase from the year before

Despite the fact that shipments totaled 8.2 million, an increase of 8.9 percent from 2005, overall revenue within the server market was nearly flat year-over-year. In 2006, server revenue stood at \$52.7 million, an increase of only 2 percent from 2005.

According to Gartner, the x86 server market slowed in the fourth quarter of 2006, while IT administrators waited to evaluate newer systems based on quad-core processors.



Intel, the world's largest supplier of microprocessors, introduced its quad-core Xeon 5300 series processors in November 2006. Intel's main rival, Advanced Micro Devices, is scheduled to release its quad-core Opteron processors, code-named Barcelona, later in 2007.

"The slowdown really hit the x86 market in the fourth quarter," said Jeffrey Hewitt, a research director at Gartner, based in Stamford, Conn. "You have a lot of new stuff coming out, with multicore products and the ongoing AMD versus Intel situation. This seems to have lengthened the sales cycle and clients are waiting to evaluate these new products before they decide on what to buy."

Companies also bought fewer servers as the adoption of virtualization technology—the ability to run multiple applications and operating systems on a single server—continued to gain momentum.

"Virtualization did have an effect on the market but it was not as great an effect as the lengthening of the sales cycle," Hewitt said.

Of the top five server vendors, Sun Microsystems had the best turnaround from a year ago. In 2006, the company's server revenue stood at \$5.7 billion, an increase of 15.4 percent. Sun's 10.8 percent revenue share in the global market placed the company third behind IBM and HP.

"By pushing its share ahead 1.2 percent to reach 10.8 percent, Sun reversed a yearly revenue share decline trend that had been occurring since 2001," the report said.

Blades remained the hottest segment of the server market. The revenue for blades grew 36.5 percent, while the number of systems shipped worldwide grew 33 percent. Once again, IBM remained the blade leader with 41.1 percent of the market's revenue, but HP managed to close the gap with a 32.5 percent share of the market. Together, the two companies totaled nearly three-quarters of blade market revenue worldwide.

"The technology the two companies have developed with their blades is pretty strong and they have managed to make really strong and appealing products," Hewitt said.

In addition, the Gartner survey showed that shipments of RISC-Itanium Unix servers had fallen 1.6 percent, while mainframes—a segment of the market dominated by IBM—had a revenue increase of nearly 4 percent.

Among the top five vendors, IBM had the greatest share of market in terms of revenue with 32.1 percent. HP was second with 27 percent, while Sun placed third with 10.8 percent. Dell and Fujitsu/Fujitsu Siemens rounded out the top five.

IBM was helped by the revenue growth of its System z and System x series, although revenue for its System p and System i series fell.

HP led all server vendors in shipments with 27.5 percent of the market. Dell was second with 21.7 percent of all worldwide shipments and IBM was third with 15.7 percent. Sun and Fujitsu/Fujitsu Siemens placed fourth and fifth respectively.

To take the top spot, HP was helped by shipments of its ProLiant servers, which grew by 8.5 percent, and its Integrity line, which increased 30.1 percent compared with last year. However, all other HP server shipments declined in 2006.

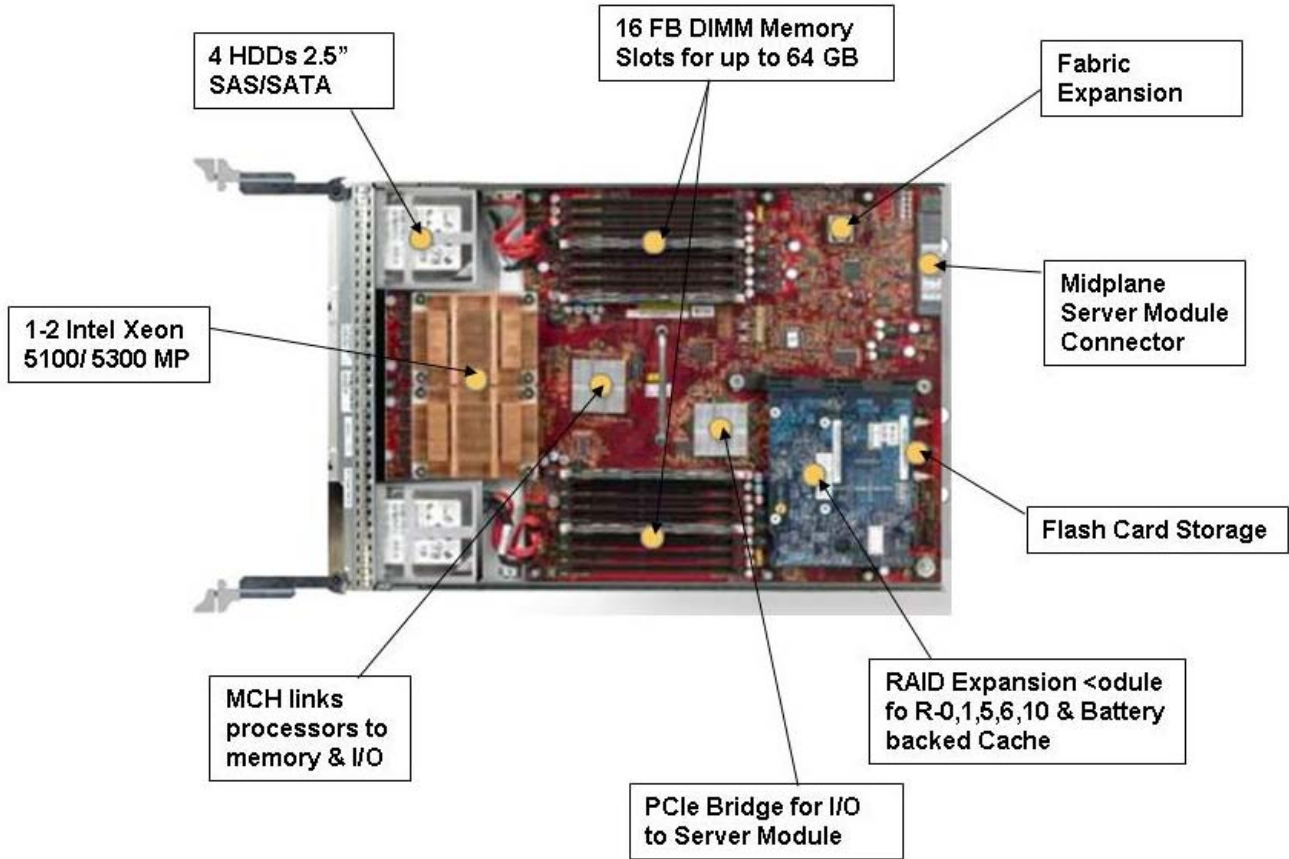
In the x86 market, HP was the leader in both revenue and shipments. Sun led the RISC-Itanium Unix server market in terms of revenue and shipments

## Competitive Position

By offering "the three fastest processor platforms, three operating systems, the most memory and I/O bandwidth," the new Blade 6000 system will enable customers to upgrade to virtualized blade platforms "without the expense or technical compromises presented by competitors." The new system can support large memory configurations

## Blade Server Modules

### Sun Blade X6250 Server Module



### Sun Blade Server Modules - Comparison

Three different server blades, up to a combined total of 10 per chassis, all loadable from the front of the chassis, are currently offered:

Server Blade	Sun UltraSPARC T1	Intel Xeon	AMD Opteron
<b>Total Sockets</b>	2 sockets	2 sockets	2 sockets
<b>Total Cores</b>	8 cores	8 cores	4 cores
<b>Threads per Module</b>	32 threads per module	8 threads per module	4 threads per module
<b>Servers</b>			Industry standard x64
<b>OS Compatibility</b>	Solaris OS compatibility	Multiple-OS	Multiple-OS
<b>Performance</b>	Unmatched, multi-threaded throughput	Large cache size Fastest integer performance	Fastest floating point performance
<b>Thermionics</b>	Best power/cooling efficiency		

## T6300 - Sun Processor based Blades

- Sun Blade T6300 is based on Sun's own "Niagara" Sparc T1 multicore processor but only available in single-socket\* configurations. It supports for up to 32 simultaneous processing threads per module and includes 8 DIMM slots for up to 32 GB of RAM per blade.
- \*The Niagara-2 chip will have SMP electronics in it to gang up two chips on a single board.
- 4 different configurations of the T6300 blade, which vary by the number of Sparc cores activated on the T1 chip, the speed of the cores, and the amount of base main memory on the blade are enumerated below:



T6300 Configurations	Small	Medium	Large	Extra Large
<b>Cores/processor</b>	six cores	eight cores	eight cores	eight cores
<b>Core Speed</b>	1 GHz	1 GHz	1.2 GHz	1.4 GHz (tops)
<b>Main Memory</b>	4 GB	8 GB (4x 2 GB DIMMs)	16 GB (8x 2 GB DIMMs)	32 GB (8x 4 GB DIMMs)
<b>Processor Thermionics</b>				75 watts
<b>Price</b>	\$5,995	\$13,995	\$19,125	\$41,995

## T6250 – Intel Processor based Blades

The X6250 blade is a two-socket blade server that plugs into the Blade 6000 chassis and uses a range of Intel quad-core chips as well as a single dual-core chip. This blade also uses Fully Buffered DIMM (FB-DIMM) main memory, **not the DDR2 main memory** used in the Opteron-based Galaxy and Constellation machines.

Sun Blade X6250; an Intel Xeon driven blade supporting 1 or 2 quad or dual core 5000 series processors (up to 8 cores per module). Like the AMD blade, the Intel blade has 16 DIMM slots for up to 64 GB of memory per server module.

The Blade 6000 is the first Sun box that will sport Intel processors, too, and is the result of a partnership between Sun and Intel that was announced in January. Under that deal, Sun is using Intel's Xeon chips in its "Galaxy" rack-mount and Constellation blade servers, and Intel is embracing Solaris as a Unix of choice on the X64 platform

Intel decided to exit the Blade Market in June 2007 where it had a development partnership with IBM and had targeted supplying OEMs and Channel. (see IMEX Research - Blade Servers Industry Report 2007).

X6250 Configurations	Small	Small	Medium	Large	Very Large
<b>Target Market</b>			highest single-threaded performance		
<b>Sockets/Blade^^</b>	2	2	2	2	2
<b>Cores/processor</b>	Quad-core	Quad-core	Dual-core	Quad-core	Quad-core
<b>Speed</b>	1.86 GHz	1.86 GHz	3 GHz	2.33 GHz	2.66 GHz
<b>Processor Model</b>	Xeon 5320 "Clovertown"	Xeon 5310	Xeon 5160 "Woodcrest"	Xeon 5320 "Clovertown"	Xeon 5355 Clovertown
<b>Main Memory</b>	2 GB FB-DIMM	8 GB FB-DIMM	8 GB FB-DIMM	32 GB 16x 2GB FB-DIMM	32 GB 8x 4GB FB-DIMM
<b>Thermionics Design Pt.</b>	80^+20 watts	80+20 watts			
<b>Price</b>	\$3,695	\$5,995	\$6,595	\$15,995	\$25,995

Sun is also selling a blade using slower low-voltage Clovertown L5310 parts, which run at 1.6 GHz but have a Thermionics Design Point of only 50 watts.

^ That thermal rating does not include the heat from a memory controller, which runs another 20 watts or so

^^ At Intel Developer Forum in Beijing in March, Sun was previewing a four-socket blade server based on Intel's "Tulsa" Xeon MP Processors that plugs into the Blade 8000 chassis.

## X6220 – AMD Processor based Blades

Sun Blade X6220; an AMD Opteron driven blade with two dual core AMD Opteron 2000 Series processors (4 cores per module). 16 DIMM slots are provided supporting the loading of up to 64 GB of memory per module.

X6220 Configurations	Small	Medium	Large	Extra Large
<b>No of Processors</b>	2	2	2	2
<b>Cores/processor</b>	Dual	Dual	Dual	Dual
<b>Speed</b>	2 GHz	2.8 GHz	2.8 GHz	3 GHz
<b>Processor Model</b>	Opteron 2212	Opteron 2218	Opteron 2220	Opteron
<b>Main Memory</b>	4 GB of DDR2	8 GB of DDR2	16 GB of DDR2 (2 GB DIMMs)	32 GB (4 GB DIMMs)
<b>Thermionics* Design Pt.</b>	95 watts	95 watts	95 watts	
<b>Price**</b>	\$3,995	\$5,595	\$8,395	

\*AMD also sells dual-core chips that get down into the 68 watt range as well.

\*\* One of the reasons why those prices are so low is that these two blades, which have 16 memory slots, are using very inexpensive 1 GB DIMMs.

When the quad-core "Barcelona" chips are ready for market later this summer, these chips will plug right into the Constellation X6220 boards. Sun is ready for Barcelona, and AMD needs to get the chip out the door.

## Blade Servers Thermionics

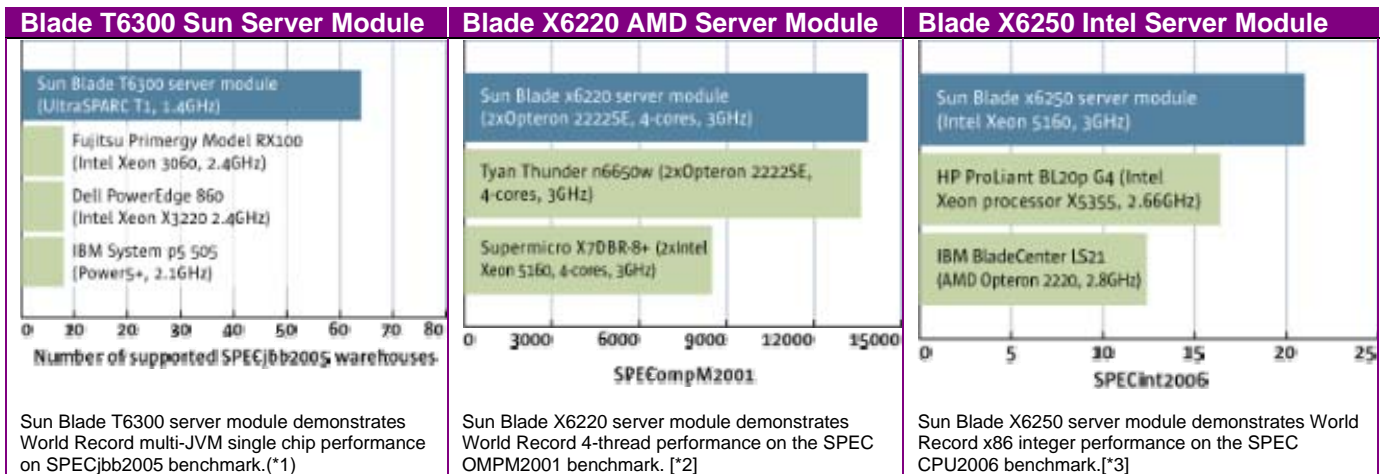
While Blade Server X6250 using Intel Processors have the Thermionics Design Points of 100 watts per microprocessor, Sun is also selling a blade using slower low-voltage Clovertown L5310 parts, which run at 1.6 GHz but have a Thermionics Design Point of only 50 watts.

Sun Blade Servers X6220 using family of AMD Opteron 22xx family of processors has a Thermionics Design Point of 95 watts, AMD also sells dual-core chips that get down into the 68 watt range as well.

## Storage

The blades have room for four 2.5-inch SAS drives too, and can also use SATA disks, which are larger.

## Performance Benchmarks – Sun Blades



(\*1) SPEC, SPECjbb are TM of the Standard Performance Evaluation Corporation. Results as of 06/04/2007. For the latest, visit <http://www.spec.org>. Sun Blade T6300: 96523 SPECjbb2005 bops; 24131 SPECjbb2005 bops/JVM. Fujitsu Primergy Model RX100: 49892 SPECjbb2005 bops; 49892 SPECjbb2005 bops/JVM. Dell PowerEdge 860: 112092 SPECjbb2005 bops; 9 6523 SPECjbb2005 bops/JVM. IBM System p5 505: 41751 SPECjbb2005 bops; 41751 SPECjbb2005 bops/JVM.

(\*2) (\*3) SPEC, SPECComp are TM of the Standard Performance Evaluation Corporation. Results as of 06/04/2007. For the latest, visit <http://www.spec.org>.

### World Records using Industry Standard Benchmarks

The Sun Blade 6000 Modular System also packs a performance punch with its comprehensive choice of versatile server modules. Regardless of the underlying microprocessor architecture, the innovative system design combined with the latest capabilities of the Sun Studio 12 software running on top of the Solaris 10 OS propelled these new blades to the top of industry-recognized Java, HPC and compute-intensive benchmarks. Additional details on these record-breaking results can be found at: <http://www.sun.com/servers/blades/6000/benchmarks>.

## Go-to-Market Strategy

### Distribution Channels Programs

The pricing Sun is showing, and lack of a proprietary switch is something a mid-size company could buy and grow with.

With the 6000 series, Sun can go after a couple of different market segments. With the UltraSparc option, companies with older Sun servers can look to the 6000 as a consolidation play. It's going to make very logical sense for some customers and it will help Sun stop from hemorrhaging through seeing its customers flee to competition as customers consolidated and adopted virtualization in their data centers. While we do not expect this announcement to sway non-Sun customers into their camp, the new blades should influence existing Sun customers who have remained on the fence about their blade offerings to date. **But the 6000 is expected to cannibalize Sun's own rack servers.**

### Try & Buy Incentives

Sun is expanding its channel programs to include the Sun Blade 6000, including its 60-day try-and-buy program, Startup Essentials, to let customers get started with the lowest cost, and a starter kit. The starter kit makes a Sun Blade 6000 enclosure and one or two server blades available to customers with application kits for software like VMware and Oracle, all at a 25 percent discount.

Early access and beta customers include Oregon State University and the University of Notre Dame.

## Future Proofing Customer's Investment

Sun will support all future processor upgrades through 2012 with the Sun Blade 6000 platform including quad-core, octo-core and so on, making it a future-proof investment for solution providers and their customers.

The blades that get inserted into the 6000 hold fewer processors, which make the individual blades cheaper. The blades designed for Xeon and Opteron processors can hold two multicore processors each while the Niagara blade can hold one eight-core chip.

The Sun Blade 6000 Modular System uses microprocessors from Sun, Intel and AMD, and provides support for Solaris, Windows and Linux operating systems. In addition, the new systems have been designed to maximize customer investment by supporting microprocessors with four and eight cores. All this enables the Sun Blade 6000 Modular System to run virtually any enterprise application.

Sun Blade 6000 easily integrates into existing datacenter infrastructure and management systems, without requiring proprietary I/O, proprietary management or hidden licensing costs. System features and support for the Solaris 10 OS, Windows and Linux ensure optimal performance, while allowing customers to scale for future growth without forklift upgrades.

## Built to last - Scalability Built In

Creating a next generation computer architecture and blade systems design that lasts for next 5 years, integrates industry standard elements to achieve lower costs through volume economics, virtualizes these elements to these elements to meet the latency and bandwidth requirements posed by different workloads yet remains easily upgradeable to leverages availability of newer and emerging technologies. Sun has achieved remarkable success in achieving future-proofing in its BladeSystem 6000 designs. Users can continue to add more (processing) cores, networking and storage. Virtualization and database clusters will have an easy time with Sun's high-capacity blades. Sun claims of a future-proof chassis with an ability to simply add more memory and I/O and by upgrading processors look believable.

We make our blades look like individual servers, so managing them is standard; they talk to the management network the same way typical rack-mount servers do. If you are using typical management tools from say Hewlett-Packard or IBM, you can use them in our blade chassis. This is different than most vendors who lock you into their products. The new blades also use the industry standard PCI-Express I/O architecture and adapters, meaning that customers can choose from a wide variety of standard adapters, rather than proprietary adapters designed for a specific blade system.

Selling it as an "open" platform, Blade 6000 assimilates into existing data center infrastructure and management systems easily and doesn't require proprietary I/O, management software or present any hidden licensing costs, as with other vendors' blades.

These blades are built around performance by Sun engineers with double the memory and I/O capacity compared to the competition. We've put a real Unix blade together here. The system is similar to T1000 and T2000 servers - 16 DIMM, 64 GB of memory, and it will run the whole host of OSes – Sun has created a computing platform to last the next 5 years

## Sun Services

### **Sun Refresh Service: Building an "Always Fresh" Datacenter**

The Sun Refresh Service now includes the Sun Blade X6220 Server Module, allowing customers to reach maximum performance and efficiency from their datacenters on an ongoing basis at half the cost of traditional acquisition methods. The subscription service program includes installation of the Sun Blade 6000 Modular System with server modules, plus three refreshes of server modules over a 42-month period. Customers receive automatic upgrades to the latest blade architecture as soon as it becomes available.

<http://www.sun.com/refreshservice>.

Several customers are on the verge of refreshing their servers & tackling server sprawl. With this new range of blade servers from the Sun stable there will be positive impact on physical, technical & operational aspects in a datacenter.

With the Sun Refresh Service, you can take advantage of the latest technological advancements by continuously enhancing the productivity of your existing datacenter infrastructure.