

New Sun Fire 15K server takes product line from \$1,000 to \$10 million

BY LARRY STORER

The much anticipated Starcat server that was to be the new high end beyond the Sun Enterprise 10000 was introduced by Sun Microsystems Inc. (www.sun.com) as the Sun Fire 15K, a data center architecture that Sun executives say employs a fundamentally different design philosophy to offer customers a clear alternative to the costly, complex solutions from companies such as IBM.

The system, said John Shoemaker, reflects Sun innovation in two key areas:

- an innovative technology to connect all the various system components for maximum system flexibility and application performance; and
- Sun's newest generation technology to divide and resize a system into many separate segments — or "servers" — for optimal management and resource use.

Unix servers are the biggest part of the server market, accounting for about \$29 billion of the \$60 billion overall server market in 2000.



Sun Fire 15K server

IBM is the largest server seller, but in the Unix server market Sun is No. 1, HP is No. 2 and IBM remains in third place. However, IBM gained Unix server market share in the second quarter of 2001 while HP and Sun both lost ground.

Sun President and COO Ed Zander said the Sun Fire 15K is the culmination of five years of investment in R&D, giving Sun an unrivaled product line with which to win new market opportunities.

"In 1997, the Sun Enterprise 10000 server took the industry by storm," Zander said. "The new Sun Fire 15K system exceeds the Enterprise 10000 in every dimension of scalability, availability and performance. Now, not only do we have a product that's peerless, we are the only company with a fully-compatible product family from below \$1,000 to \$10 million."

Zander said the Sun line offers the best cost of ownership, allowing customers to leverage their investments in applications, operating systems, administration, training and the like, across their corporate data center.

The high end is about 20 percent of Sun's sales. With Sun Fire 15K, Sun is not only aiming at the Unix high end, but also at mainframes.

It is the innovation in design that has Sun executives characterizing the server as a "mainframe." The Sun Fire 15K has a Sun Fireplane triple redundant crossbar interconnect triple redundant with an 18-inch by 18-inch crossbar. Fifty percent of the Fireplane logic provides error detection, recovery and fault injection.

At the heart of the system, with some five miles of wiring, is the Sun Fireplane interconnect that offers unprecedented throughput, critical for superior application

performance. With the ability to transfer 172GB per second, this high performance, triple cross-bar design enables predictable, high performance across a range of applications.

John Shoemaker, executive vice president of computer systems at Sun, said the Sun Fireplane interconnect is the only one of its kind and is three to five years ahead of expected competitive offerings.

Features include:

- 106 third-generation 64-bit UltraSparc III processors in one system cabinet — the largest server in the industry in a single cabinet;
- largest memory in a single system — half a terabyte, already two to four times that of the competition, and expandable to 1TB with future memory expansion upgrades;
- 4PB of disk storage;
- dynamic resizing of the system — up to 18 independent systems;
- hot swappable components and 100 percent component redundancy for highest availability;
- the ability to mix CPUs of different speeds in the same system;
- the industry's best platform for implementing services-on-demand, using the Sun ONE software suite; and
- Uniboard technology, which allows shared CPU/memory boards across Sun's entire data center server line.

The Sun Fire 15K has the ability to scale beyond 1,000 CPUs. The 900MHz UltraSparc III copper processor harnessed by the power of Solaris 8, enables linear scalability and application speed. The UltraSparc processor roadmap supports field upgradeability to speeds of 1.8GHz and beyond soon. And with hot CPU upgrades, the Sun Fire 15K server enables resources to be added while the system is up and running.

The Sun Fire 15K server also features a whopping 576GB memory in a single system, allowing applications to run directly in fast memory without having to access external storage devices. The large single system memory also enables new capabilities for applications never before possible - from large memory resident databases to complex scientific applications such as human genomics or offshore oil exploration.

"At nearly 2.5 times the MIPS rating (millions of instructions per second) of the largest mainframe, the Sun Fire 15K server has the most balanced high-performance server architecture available and delivers the industry's best benchmark results in real-world applications, including SAP, Java platform performance (SPECjbb) and high performance computing (Fluent).

He said the Sun Fire 15K system is the culmination of an 18-month roll-out of Sun's entire compatible product family.

"Together with Sun StorEdge array, Solaris 8, our new service offerings, and our Sun Open Net Environment (Sun ONE) suite of software, the Sun Fire 15K offers customers a clear choice to improve their productivity while reducing cost of ownership and regaining control of their data centers."

The new Sun Fire 15K system includes features designed to reduce the cost of ownership of large systems through server consolidation and mainframe application rehosting, while helping customers retain their investments in people, training, tools and applications.

Since introducing the Sun Enterprise 10000 server four years ago, Sun has added features not found in competitive server technology. The new Sun Fire 15K server adds features such as:

- Concurrent Dynamic reconfiguration for simultaneous online maintenance,
- Full hardware redundancy eliminates unplanned downtime, and
- Automatic failover for critical housekeeping and monitoring functions.

Referring to midrange announcements from Hewlett-Packard and Silicon Graphics, and high-end introductions from IBM, Shoemaker said that, based on the capacity, feature set, and RAS robustness, Sun expects its Sun Fire 6800 server announced earlier this year to exceed the capabilities of these anticipated competitive Unix platform announcements.

Dynamic System Domains

Already available on the Sun Enterprise 10000, which has an installed base of 5,000, Dynamic System Domains make Sun systems the only Unix servers able to dynamically manage multiple workloads, a key success factor for large-scale server consolidation projects.

He said that with fifth generation Dynamic System Domains, the Sun Fire 15K server includes secure domain architecture, each of the 18 Dynamic System Domains is 100 percent fault-isolated, and enables the movement of CPUs and memory independent from and across other domains.

Although IBM has been partitioning their mainframes for 20 years, partitions on its Unix systems are new and are soft partitions as opposed to hard-wired partitions. Shoemaker said no one else offers the ability to manage and dynamically isolate potential faults like the Sun Fire 15K system.

Sun Fire 15K server shares common components with the midframe Sun Fire product line introduced earlier this year. This includes the "Uniboard" technology, which provides common CPU/memory boards, to enable common sparing in order to meet peak demand of resources. This inter-generational compatibility provides guaranteed investment protection and significantly simplifies customers' data center provisioning approach.

Capabilities such as the SunPlex clustering capability, Live Upgrade, Hot Patching, Dynamic Reconfiguration, Remote Monitoring, Resource Management, Bandwidth Allocations and Automatic System Recovery minimize planned and unplanned downtime to achieve the high availability needed for mission critical application services.

Benchmarks

In terms of performance, Shoemaker said Sun and IBM have different design philosophies. IBM reports results from controlled, lab-environment tests; Sun reports results that he said are "industry leading for real-world business and technical applications that are a better indicator of actual workloads and environments."

Sun said the Sun Fire 15K system outperformed IBM's best result (IBM iSeries model 840) in the industry standard SAP-SD/Oracle 2-tier benchmark —even with three times more users.

On the SPECjbb Java application benchmark, the Sun Fire 15K server outperformed an IBM p680 by 2.5 times. Additionally, a Sun Fire 15K system showed a 59 times speed-up over 72 CPUs and ran 23 percent faster than a 128-processor IBM xSeries server in the high-performance computing Fluent benchmark.

Sun officials said the new Sun Fire 15K server is nearly three times as powerful as IBM's biggest mainframe (based on mainframe MIPS ratings), the zSeries 900, and offers better price/performance.

New services

Sun also announced new services to help customers design, implement and manage their environments with the high availability levels at low total cost of ownership.

These include new consolidation and migration services, high availability service packages and the RAS Profile service that includes 1,300 knowledge-based rules to optimize configurations.

Shoemaker said Sun also demonstrated the first-ever fully integrated product platform ideal for rehosting mainframe applications. The SunTone Cluster Platform integrates two Sun Fire 15K servers with the recently announced Sun StorEdge 9960 system and Sun Cluster 3.0 software.

"Sun calls into question any further investments in mainframes with the acquisition of mainframe rehosting software from Critical Path Inc., which migrate mainframe applications to a flexible open computing environment," Shoemaker said.

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This solution takes the power of the Sun Fire 15K to the next level by integrating the storage environment of the Sun StorEdge 9960 system to deliver the integrated SunTone Cluster Platform that can deliver an unprecedented 99.999 percent availability. The Sun Fire Cluster Platform will significantly reduce TCO by delivering a simpler, safer and swifter choice for a highly available infrastructure.

IBM, HP not impressed

Mark Hudson, Hewlett-Packard worldwide marketing director for HP Unix servers, said he disagreed.

"You know, this is the first high-end system Sun has developed themselves," Hudson said. "When they introduced the Sun Fire 6800, there were technologies that were to be included that still have not been delivered — what assurance do customers have that this launch won't be the same or worse? How can customers be assured their existing high-end system applications will even run on this new unproven architecture?"

"Which benefits make the Sun Fire worth the risk?"

Hudson said there was also the problem of UltraSparc III, which he said is a generation behind the entire industry. While the Sun Fire 15K server is being introduced with 900MHz processors, a Sun spokesman said an announcement on that front could be made very soon.

Finally, he said Sun seems focused only on fault recovery (using redundant components) instead of fault avoidance with reliable technology such as chip kill memory or hardware memory scrubbing.

Sun emphasizes that its partitioning technology can consolidate large numbers of lesser servers within a single computer that's easier to manage.

But partitioning a system into independent domains is something IBM developed in its mainframe computers and brought to its just announced new top-end 32-processor p690 Regatta server.

IBM's mainframe marketing manager Peter McCaffrey, disagrees with Sun's claim of pioneering partitioning on servers.

"We essentially invented partitioning technology," McCaffrey said.

"Sun in many regards is shooting for where we were 20 years ago. Putting a little bit of mainframe (technology) in everything we do across the other product lines is a whole lot easier than to reinvent the wheel, which is where Sun's going," McCaffrey said.

Customers happy with innovation

Osamu Gotoh president and CEO Itochu Techno-Science Corp. said the Sun Fire 15K server builds on Sun Microsystems' success with the Sun Enterprise 10000 server, and as such it is the system CTC has been eagerly anticipating.

"Having shipped more than 150 Sun Enterprise 10000 servers to our customers, CTC has extensive experience and technical know-how in the high-end server market. With its mainframe class, mission-critical design, the Sun Fire 15K server will certainly give CTC the power to expand our business," Gotoh said.

Epson Director and Deputy CEO Yasumasa Otsuki said that to help Epson cope with the growing market demand for high temperature polysilicon TFT (thin film transistor) panels that are used in liquid crystal projectors, Epson has chosen Sun Microsystems for its high reliability and predictable application performance to help ensure its production systems are up and running 24 hours a day.

"Sun Microsystems' Sun Fire 15K server has taken this to an unprecedented level for us," Otsuki said.

"From an environmental perspective, Sun's consolidated system is a natural choice for Epson. The Sun Fire 15K server delivers maximum effectiveness with the minimal number of servers, thus conserving power and space.

"Like any business, we want to maximize the effectiveness of our workforce and business processes. What that means to Epson is that we simply want our applications to run reliably — from our process governance software and our Oracle application to our in-house software."

Akinobu Shigeki, senior vice president of the public administration division at NTT Data Corp., said in his large-scale projects, high availability is not an option, it's a requirement.

"Our mission-critical projects require availability 24 hours per day, 365 days per year," Shigeki said. "With the new Sun Fire 15K server, Sun Microsystems has shown us that it is dedicated to providing the top levels of reliability, availability and scalability with an

iron-clad platform that can't be matched. Offering a mission-critical system provider peace of mind is no easy task, but with the robustness of the Solaris Operating Environment and Sun's architectural vision behind us, we believe that we'll continue delivering our customers the superior service they've come to expect."

Mike Vildibill, deputy director of resources for the San Diego Supercomputer Center (SDSC), was one of the first customers to use the Sun Fire 15K server.

"The Sun Fire offers the performance needed to support our data-intensive requirements ranging from storage management, relational databases, data mining and data-intensive scientific applications such as those in bioinformatics," Vildibill said. "The solid reliability and manageability of the system allows us to deploy our most critical services. The combination of reliability and performance makes the Sun Fire a critical component to our IT infrastructure."