

# Bulletin

## **Sun's StarCat: A High-End Server Designed to Pounce into High-End Data Centers**

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### **IDC Opinion**

*What is Sun Microsystems' StarCat system, and what markets is it designed to attack?*

Sun Microsystems' quick entry into the high-end server market back in 1997 was the result of a great "buy" of Cray technology rather than a Sun-only "build." Nearly five years on, Sun has redesigned its high-end server entirely, basing it on UltraSPARC III chips, Solaris 8, and enough redundant components for near-continuous operations. Sun aims to prove that StarCat can completely replace IBM-compatible mainframes, which are known for extremely high levels of availability and controllability. The new Sun machine is off to a good start, with strong hardware and software features, up to 18 partitions for workload isolation, and sophisticated resource-management software. But its price range of \$1–10 million and its required use of Solaris 8 rather than widely used older versions of Solaris, combined with an environment of economic uncertainty, may limit a quick ramp-up in CY01.

## Product Highlights

On September 25, Sun announced its new StarCat server, formally called the Sun Fire 15000, or Sun Fire 15K. This follow-on to the popular Enterprise 10000 server (code-named StarFire) will be priced from \$1 million to more than \$10 million (when fully outfitted with maximum amounts of storage and peripherals), depending on configuration. It can also be clustered with other StarCat systems to create extremely large computing systems.

Highlights of the announcement include the following:

- 72 UltraSPARC III RISC microprocessors, running at 900MHz
- Another configuration, with 106 UltraSPARC III processors running at 900MHz and up to 576GB of memory, to be available
- Solaris 8 server operating system
- Use of “common components,” including CPUs, memory, and I/O that are used in all other Sun Fire server systems (3800, 4800, 4810, and 6800) that were introduced in March 2001 (each Sun Fire “server-blade” building block [also called a Uniboard] contains four UltraSPARC III processors and up to 32GB of memory)
- Flexible provisioning of Sun Fire CPU/memory “Sun Fire server blade” system boards, or Uniboards
- Hot CPU upgrade that allows processors to be added while the system is running
- Support for mixed-speed processors within a domain
- Automated Dynamic Reconfiguration (ADR) of system partitions, supported by Solaris 8, allowing for the addition or repair of processors, memory, and I/O while system is running
- Key software modules include Solaris Resource Manager (SRM), Sun Cluster 3.0, and the Sun Management Center (SMC) console
- Overall system bandwidth of 100GB/sec+ with the Sun Fire Interconnect centerplane
- I/O bandwidth of 21GB/sec
- Fully redundant I/O paths to ensure continued processing
- Eighteen I/O hubs to reduce system bottlenecks
- Packaged professional services for data center best practices

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Pricing starts at \$1.4 million for a 16-processor system with 16GB of memory and ranges up to \$4.4 million for a 72-processor system with 288GB of memory and 3.9TB of storage. A 106-processor system with 500GB of memory and nearly 4TB of storage is priced at \$7.1 million.

## **Snapshot Analysis**

### ***Is the StarCat a Unix Mainframe?***

The central notion of StarCat is that the day of the Unix high-end system as the “top gun” of a corporate data center has arrived. IBM, the builder and guardian of System/360/370/390 mainframe architecture for more than 30 years, is now the only IBM-compatible mainframe player in the field. (Mainframes are one type of high-end server, and high-end servers — by IDC definition — are priced at \$1 million or more.) In the last year, IBM mainframe competitors Amdahl Corp. and Hitachi Data Systems have dropped plans to field next-generation IBM-compatible mainframe servers and have refocused their businesses. (See *Amdahl's Exit from the S/390 Market Offers Opportunity and Concern* [IDC #23227, October 2000] and *Hitachi Data Systems' S/390 Hiatus Hurts All of Us* [IDC #21818, March 2000] for more information.)

Technically, the StarCat cannot be a traditional IBM-mainframe because it does not run IBM's System/390 operating system (or previous versions, including System/360 and System/370 operating-system software). However, Sun's point is that it can run mainframe-style workloads — and that it can run them in partitions — in the manner of the IBM mainframe servers.

Further, the Sun system's Automated Dynamic Reconfiguration (ADR) software, a feature that is built into Solaris 8, will allow partitions to “grow,” through the addition of processors and memory, as workloads grow within the partitions. From there, Sun's Solaris Resource Manager (SRM) software can be used to shift workloads from one partition to another.

Sun would like to replace a “slice” of IBM's installed base of G-Series and older IBM System/390-compatible mainframe systems. IDC research shows that there were approximately 11,200 IBM ES/9000 S/390 systems (in both the midrange and high-end price bands) installed worldwide by the end of CY00. In October, IBM said it has shipped more than 1,000 zSeries mainframes (of all sizes) since their introduction in CY00. The zSeries systems can run the traditional IBM OS/390 server operating system or the new IBM zOS server operating system.

In addition, there were approximately 2,000 IBM-compatible high-end server machines installed worldwide by the end of CY00 — split between those made by Amdahl and those made by Hitachi Data Systems. Many of these systems are now more than five years old, and most of them carry heavy monthly license fees for OS/390 (or the older MVS operating system) and related systems software and applications. IDC anticipates that there will be an accelerated

retirement rate for Amdahl and Hitachi Data Systems mainframes due to their deemphasis on IBM-compatible machines announced during CY00 and CY01.

All of this will serve to “clear the way” for a new generation of high-end Unix servers, including those made by Sun, Hewlett-Packard, IBM, Compaq, and Fujitsu-Siemens (for high-end server market share, including all servers and Unix-only servers, see Tables 1–4). All of these vendors have extended their 64-bit Unix/RISC architectures from the midrange to the high end. Sun is targeting this product-transition period for its renewed marketing initiative to gain market share from traditional IBM mainframe sites. One recent Sun campaign, dubbed the “Blue Bomber” marketing campaign, specifically targeted IBM mainframes for replacement by Sun’s high-end Unix servers, according to information provided in a recent Sun quarterly call to financial analysts.

**Table 1**  
**Worldwide High-End Unix Server Revenue by Vendor, 1999 and 2000**

	1999		2000		1999–2000 Growth (%)
	Revenue (\$M)	Share (%)	Revenue (\$M)	Share (%)	
Sun Microsystems	1,144.4	43.2	2,107.2	47.1	84.1
IBM	662.9	25.0	842.0	18.8	27.0
Hewlett-Packard	184.2	7.0	511.9	11.4	177.9
NCR	282.3	10.7	317.4	7.1	12.4
Compaq	14.9	0.6	134.0	3.0	800.6
SGI	184.0	6.9	117.1	2.6	-36.3
Fujitsu	25.3	1.0	93.6	2.1	269.9
Amdahl	67.9	2.6	82.0	1.8	20.8
Hitachi Ltd.	19.7	0.7	73.6	1.6	273.7
NEC	0.0	0.0	71.9	1.6	NA
Subtotal	2,585.6	97.6	4,350.6	97.2	68.3
Other	63.1	2.4	125.5	2.8	99.0
Total	2,648.7	100.0	4,476.1	100.0	69.0

**Messages in the Data:**

- The top 5 high-end server vendors controlled more than 87% of the total market share in 2000.
- Sun continues to dominate the high-end server Unix market, with 47% market share, due to the success of its E10000 server.
- As vendors began volume shipments of new systems, the high-end server space realized a dramatic overall growth of 69% in 2000.

Source: IDC, 2001

**Table 2**  
**Worldwide High-End Unix Server Shipments by Vendor, 1999 and 2000**

	1999		2000		1999-2000 Growth (%)
	Shipments	Share (%)	Shipments	Share (%)	
Sun Microsystems	1,691	66.7	1,926	55.9	13.9
Hewlett-Packard	153	6.0	532	15.4	247.7
IBM	223	8.8	342	9.9	53.4
NCR	204	8.0	249	7.2	22.1
Amdahl	107	4.2	92	2.7	-14.0
Data General	21	0.8	68	2.0	223.8
Compaq	20	0.8	61	1.8	200.6
SGI	71	2.8	44	1.3	-37.8
Fujitsu-Siemens	0	0.0	34	1.0	NA
NEC	0	0.0	32	0.9	NA
Subtotal	2,491	98.2	3,380	98.1	35.7
Other	45	1.8	64	1.9	42.3
Total	2,536	100.0	3,444	100.0	35.8

**Messages in the Data:**

- Sun's unit-shipment market share in the high-end Unix server market decreased in 2000, while its revenue-based market share increased in 2000 due to sales of high-end systems with higher average sales prices.
- HP had triple-digit growth in unit shipments — more than doubling its market share due to volume shipments of Superdome.
- Unit shipments grew a healthy 35.8% in 2000, with all but two vendors showing growth.

Source: IDC, 2001

**Table 3**  
**Worldwide High-End Server Revenue by Vendor, 1999 and 2000**

	1999		2000		1999-2000
	Revenue (\$M)	Share (%)	Revenue (\$M)	Share (%)	Growth (%)
IBM	4,614.5	42.2	4,269.4	36.3	-7.5
Sun Microsystems	1,144.4	10.5	2,107.2	17.9	84.1
Compaq	764.9	7.0	934.7	7.9	22.2
Fujitsu	674.7	6.2	888.3	7.5	31.7
Hewlett-Packard	360.1	3.3	667.2	5.7	85.3
Hitachi Ltd.	633.9	5.8	561.2	4.8	-11.5
Unisys	626.1	5.7	516.2	4.4	-17.5
Amdahl	426.4	3.9	432.4	3.7	1.4
NCR	282.3	2.6	317.4	2.7	12.4
Fujitsu-Siemens	57.7	0.5	310.5	2.6	438.3
Subtotal	9,585.0	87.6	11,004.4	93.4	14.8
Other	1,355.0	12.4	772.6	6.6	-43.0
Total	10,940.1	100.0	11,777.0	100.0	7.7

**Messages in the Data:**

- For the second year in a row, IBM had negative revenue growth in the high-end space.
- Sun and HP grew more than 80% in 2000 due to volume shipments of new products.

Source: IDC, 2001

**Table 4**  
**Worldwide High-End Server Shipments by Vendor, 1999 and 2000**

	1999		2000		1999-2000
	Shipments	Share (%)	Shipments	Share (%)	Growth (%)
Sun Microsystems	1,691	25.9	1,926	27.6	13.9
IBM	1,682	25.8	1,750	25.0	4.0
Hewlett-Packard	500	7.7	826	11.8	65.2
Compaq	682	10.4	701	10.0	2.8
Fujitsu	317	4.9	322	4.6	1.6
Amdahl	334	5.1	287	4.1	-14.2
Unisys	267	4.1	259	3.7	-3.1
NCR	204	3.1	249	3.6	22.1
Hitachi Ltd.	255	3.9	184	2.6	-27.9
NEC	0	0.0	113	1.6	NA
Subtotal	5,932	90.9	6,616	94.6	11.5
Other	596	9.1	374	5.4	-37.2
Total	6,528	100.0	6,991	100.0	7.1

**Messages in the Data:**

- Growing 65.2%, HP was the only vendor that gained significant market share in 2000.
- For the second year in a row, Sun maintained the number 1 position in high-end unit shipments.

Source: IDC, 2001

Although IBM's new 64-bit high-end and midrange zSeries servers support the older IBM OS/390 systems software, and they are strong engines for ecommerce in their own right, Sun believes that it can tap enough mainframe customers for the StarCat to ramp sales outside the Sun-installed base. Sun claims that its Blue Bomber campaign has already accounted for more than 50 such system replacements for its existing Enterprise 10000 high-end servers. Figure 1 shows the current Sun product line, which is topped by the high-end Sun Fire 15000 server.

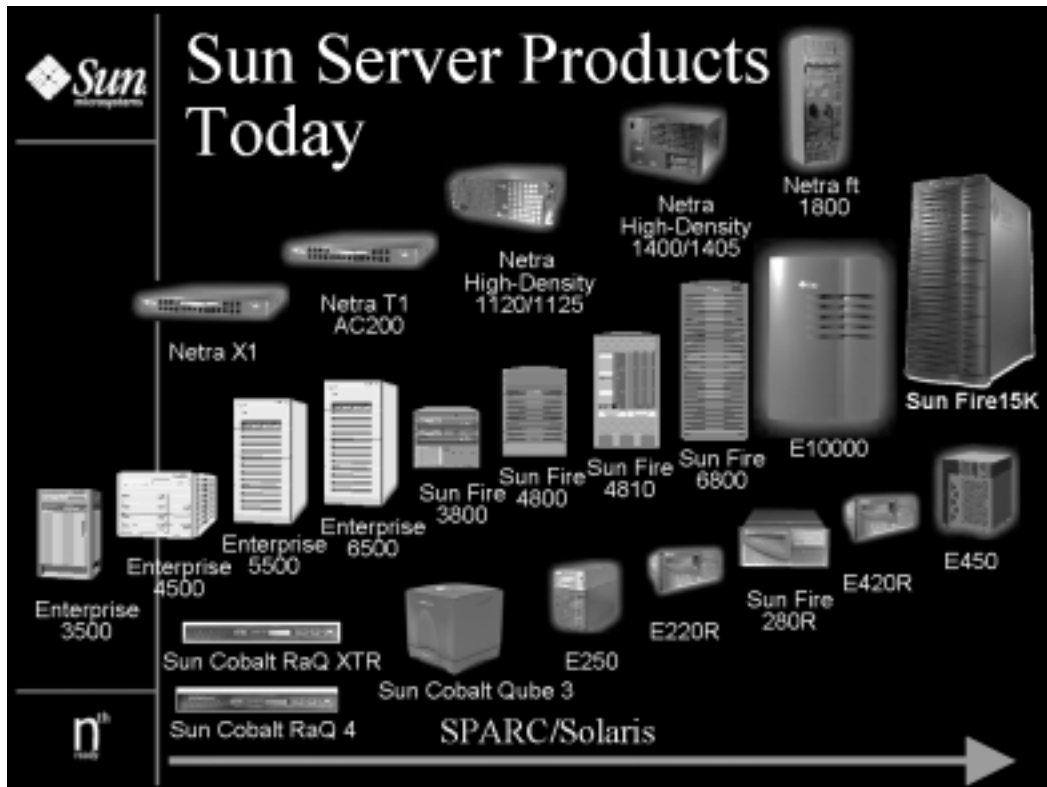
***What Sun Must Do to Displace Mainframes***

To achieve its goal as a high-end replacement, the Sun Fire 15000 must:

- Support multiple workloads running in separate partitions
- Run major packaged applications equivalent to those running on today's mainframes (financial, manufacturing, inventory, order/entry, customer database, OLTP, and database), and provide network services to thousands of end users

- Achieve 99.999% uptime, or near-continuous operations (although this is not a fault-tolerant server, it must provide equivalent uptime to an IBM Sysplex by supporting multiple server “nodes” and by running multiple, mission-critical workloads)

**Figure 1**  
**Sun’s Server Product Line**



Source: Sun Microsystems, 2001

- Manage multiple terabytes (TBs) of storage, through direct-attach drives and access to storage area networks (SANs)

To go a step “beyond” the traditional mainframes (those before the 64-bit zSeries), the Sun Fire 15000 must:

- Support open-systems applications even as it takes on traditional mainframe-style workloads, such as payroll, customer inventory databases, OLTP-based workloads, and batch-processing. This process will go more smoothly where packaged ISV applications provide the mainframe-style functionality that can run on Sun’s Solaris Unix-based servers. Otherwise, custom applications must be rewritten or modified to run on Unix servers.
- Be a stronger Internet platform than IBM’s mainframes, wherever possible. IBM has done a convincing job of merging

mainframe technology with Internet-style collaborative computing, particularly with its Lotus Domino software suite and support of Java applications. However, Sun can work to prove that it supports even more Internet-style software through its iPlanet software stack and its leverage of the Java software environment, which Sun invented in the mid-1990s. Even so, IDC notes that IBM collaborated closely with Sun on Java software and makes strong use of Java-enabled software and middleware on its high-end servers.

- Be the key “hub” of a corporate “intranet” that serves up centrally supported information to an organization’s employees, suppliers, business partners, and consumer end customers. This intranet serves up corporate data over a highly secure link to all end users on the network.
- Be the core of a corporate network. Central-site management of privately operated business networks are, after all, one of the primary tasks of traditional IBM mainframes, which maintain IBM-style SNA networks (which were combined with Internet-compatible TCP/IP networking standards many years ago).
- Manage central-site storage of multiple TBs of data. Sun helped its cause here by agreeing to resell Hitachi Data Systems’ Lightning 9900 as the Sun StorEdge 9900. This high-end storage system will compete with high-end storage systems from EMC Corp., which is a major supplier to Sun server sites.

Scalable Unix servers, including high-end servers, have long coexisted with IBM-compatible mainframes at the largest corporations, such as General Motors, Boeing, FedEx Corp., and United Parcel Service (UPS). Now, Sun must prove to mainframe customers that it has the interest, and the consulting expertise, to help them move custom applications from IBM System/390 mainframes to Sun’s Solaris-based high-end servers.

The data center is a place where high-end Unix servers can do well — and where they are far ahead of Microsoft Windows/Intel servers with regard to scalability (with the exception of systems such as the 32-processor Unisys ES 7000 CMP), reliability (with the exception of fully fault-tolerant Windows 2000 servers such as those from Stratus and NEC), and clustering capabilities for high-availability of business applications and data.

IDC’s ongoing quarterly server research shows that, to date, there are very few high-end Windows 2000 servers. That could change somewhat after Intel’s McKinley chip, the next-generation chip in the Itanium Processor Family, ships in 2002/2003. For example, HP’s 64-processor Superdome high-end Unix server will support replacement of its PA-RISC chips with Itanium chips that will run any of the following operating systems: 64-bit HP-UX 11i Unix operating system, 64-bit Microsoft Windows 2000, and 64-bit Linux. However, IDC notes that these multiple operating systems will run in separate partitions within the larger 64-processor Superdome machine.

If the installed base of IBM mainframes declines in coming years, particularly with the eventual retirement of older IBM-compatible mainframes, then high-end Unix servers are extremely well positioned to take their place at the top of the data center hierarchy. That will also put them at the center of private corporate networks and intranets — and at the heart of the storage systems that maintain the master copies of corporate data worldwide.

### ***A Platform for Server Consolidation***

In the server marketplace today a user has two options when building an IT infrastructure: build out or build up. At first glance, there are several advantages related to building out and adding several hundred small servers at one site. With the build-out strategy, each individual server is a low-cost unit that is easy to replace if a failure occurs, and getting an IT shop up and running is often completed in a short period of time.

However, there are several disadvantages that can combine to make the sites that have experienced a build-out strategy into prime targets for server consolidation. Although it is easy to replace a single low-end system that fails, having a high-end server that does not fail in the first place has enormous business benefits. Having hundreds, if not thousands, of servers increases IT sites' overall electrical requirements, causes heat-dissipation issues associated with housing so many servers together in one place, and causes higher administrative, systems-management, and personnel costs.

According to Sun, deploying a StarCat system could reduce an IT site's total cost of ownership (TCO) by up to 80%. Through server consolidation, a user can replace 1,000 or more servers with one StarCat, according to Sun.

Sun has stated that it has had success with customers that are moving to a server consolidation model. For example, according to Sun, Unicable, a Swiss supplier of banking information systems, consolidated 120 servers into one Sun Enterprise 10000 server, resulting in 30% faster run-times and a lower TCO. IDC believes that Sun, along with other high-end server vendors, will be successful in converting customers from a build-out strategy to a build-up strategy as more and more workload applications become mission critical and as customers become aware of the total cost savings that can be obtained through server consolidation.

### ***Workload Management and Partitioning***

Within one Sun Fire 15000 server, IT managers can set up as many as 18 separate partitions. Each partition can run a separate workload, including workloads that are running new copies of application software for testing and certification on the Solaris 8 operating system.

Partitioning will have the following business benefits:

- Separating workloads to ensure effective processing times through the avoidance of resource contention between multiple workloads
- Allowing server consolidation by supporting different business units' data-processing workloads within separate partitions
- Supporting the service level agreements (SLAs) that centralized IT may have provided to individual business units to guarantee uptime and processing performance
- Ensuring fault isolation should the Solaris image within any one partition go offline (IDC notes that hardware fault isolation is also supported by the StarCat system)
- Ensuring continuous data processing through the failover of mission-critical workloads from one partition to another, if needed. This internal failover capability is managed by Sun's SRM, which matches applications to available hardware resources, and by Sun Cluster 3.0 software, which can move workloads from one partition to another (and thus from one "instance" of the Solaris 8 operating system to another) within a single StarCat machine — or from one server node to another in a StarCat cluster (containing two or more StarCat servers). The hardware resources themselves are assigned to specific partitions through the use of Solaris 8's ADR capability, which allocates more processors and memory to partitions, as needed, to support growing workloads. The same ADR capability can also remove processors and memory from partitions through the process of deallocation.

### ***The Price of Playing the Enterprise Server Game***

IDC expects that there will be a high-profile partitioning "war" within the midrange and high-end server market segments. This reflects recent improvements in Unix server resource-management software, including software from Unix systems vendors (IBM, Sun, HP, Compaq, and Fujitsu-Siemens) and from third-party independent systems vendors (ISVs) such as Aurema.

In time, the current, noisy marketing war over partitioning capabilities for high-end servers will calm down to a whisper — as partitioning capabilities, dynamic reallocation of CPU/memory resources, and system-management software become the accepted level of system software that is required to play the high-end server game. Those vendors that cannot supply competitive partitioning and resource-management software will simply be left on the sidelines, IDC believes. That is because a new generation of Web-enabled data services, combined with utility pricing, will require that level of controllability and manageability to deliver enterprise service levels.

### ***A Channel Sales Approach for Big Servers?***

Many suppliers believe that the only route to market for enterprise and high-end products is through a direct sales force. The reality is that not only is this not the case now, but that it never has been the

case. What is true is that enterprise-class products are most often sold to the largest of customers, and that all customers of all sizes, and in all vertical-market segments, buy through all channels.

The challenge is that many suppliers do not assess the channel for what it is — a group of companies, each of which is unique and each of which has its own profile. Most indirect partners are not able to sell this class of system (a high-end server system) or are not interested in selling this class of system. Thus, through effective use of certification and qualification processes, the channel will actually self-select which ones will choose to sell high-end Unix servers.

Sun Microsystems has long been recognized as a very channel-friendly supplier. However, when it first introduced its high-end E10000 server in 1997, the primary delivery vehicle targeted was the direct sales force.

To the company's credit, Sun did provide the option for those partners that were interested in participating in the sale of the E10000 systems. This worked very well for Sun and its partners, since the company allowed the channel to provide its ability to augment the direct selling effort that was helping to drive E10000 sales.

Having learned from its initial foray into high-end server sales with the E10000, Sun Microsystems is embracing and working with its partners for this new product rollout of the Sun Fire 15000. IDC notes that not all Sun partners have sold high-end servers, expressed interest in selling them, or met the certification requirements for selling them. But those partners that have already done so are definitely in the fold for the Sun Fire 15000 rollout.

There are clear variations in Sun's channel strategy from a geographic perspective. Sun, like many suppliers, is totally reliant on partners in certain geographic regions of the world. In those areas, the indirect partners are the only route to market — and they are encouraged to behave more fully as Sun's direct sales reps in taking orders for all product lines. As the channel splits shift for Sun's product lines, Sun is working to accommodate a channel-neutral plan and to make a smooth transition for both its direct and indirect sales resources. IDC believes that Sun is wise not to "disallow" qualified partners in any geography and to keep its balance and neutrality in check as "artificial" obstacles such as these just serve to add more confusion and delay to a market that is already highly competitive.

### **Competitive Analysis**

Overall, IDC believes that Sun has strengthened an already-strong high-end server offering with its Sun Fire 15000 system. The system is completely balanced as a symmetrical multiprocessing (SMP) design — as was its predecessor. The microprocessors have been speeded up from 64 UltraSPARC II processors running at 466MHz to 72 UltraSPARC III processors running at 900MHz. Further, the Sun Fire 15000 units can be clustered together with Sun Cluster 3.0 software to create clusters of 288 or more processors (for a four-server cluster configuration).

The system is based on common components, or “Sun Fire server blades,” that add memory and bandwidth as processors are added to the configuration. This is designed to ensure adequate bandwidth as data traffic between the systems processors grows and to reduce I/O bottlenecks.

### ***Competing with IBM***

IBM’s mainframe marketplace is IBM’s to win — or to lose.

IBM has a lot of leverage in existing mainframe accounts, including its personal ties to those accounts via its direct sales reps, onsite support personnel, and volume discount agreements that affect hardware, software, and service prices — and thus the customer’s TCO.

More important, IBM is now the only major supplier of IBM System/390-compatible mainframes, and it will be the only major supplier of those systems going forward. So, its further development of the promising zSeries 64-bit high-end servers, including strong support for Internet-centric technologies and Linux, will help to retain IBM zSeries sites. Further, the zSeries’ Intelligent Resource Director (IRD) and License Management (LM) capabilities, when used in combination with IBM’s logical partitions (LPARs), will be extremely strong competition for high-end Unix/RISC servers from Sun, HP, Compaq, and Fujitsu-Siemens — and even for IBM’s high-end Unix servers.

Further, IBM will lean heavily on IBM Global Services’ (IGS’) capability to keep its existing mainframe sites happy — and within the IBM fold. IGS will work to extend and to maintain custom applications, which are often mission-critical applications (such as those used in airline reservation systems, stock exchanges, banks, manufacturing companies, and retail operations). IGS also acts as a source of business consultants to help longtime customers protect existing investments in IBM technology while integrating non-IBM technologies, such as Web-centric technologies, into mainframe computer systems.

### ***Competing with Hewlett-Packard***

HP’s Superdome high-end Unix server was announced one year ago, but the market has yet to feel its full impact. There are several reasons for this:

- Superdome shipments began in December 2000 but did not ramp until 1Q01 and 2Q01 when an economic downturn hit the United States and impacted IT spending.
- Much of HP’s installed base still uses older V-Class high-end servers and has not yet installed new Superdome servers.
- HP requires a formal sign-off on final acceptance of Superdomes — delaying payments (and revenue recognition) on its already-installed Superdome servers.

- HP's multiple financing options include purchases, leasing, pay per use (utility pricing), and pay per forecast (another form of leasing based on projected growth in computer usage over time). The multiple programs have caused delayed revenue on some Superdome units. In recent HP quarterly calls to financial analysts, HP executives said that about 60% of anticipated Superdome revenue had been collected, based on the already-installed Superdome shipments worldwide.

HP Superdome technology will, however, continue to compete with Sun high-end Unix servers for new customer business. Reasons for this continued competition include the following:

- HP is a strong Unix/RISC competitor, with an overall number 2 standing in Unix/RISC server systems since 1998 and a number 1 standing in Unix midrange server systems since 1997, and it has been Sun's strongest rival in recent years.
- HP has highly granular partitioning on its Superdome systems. Each Superdome has up to 16 hard partitions and up to 64 software-defined virtual partitions, or vPARs.
- HP remains a top Unix server supplier, especially where the customers are longtime HP sites. The installed base of HP Unix/RISC servers is more than 100,000 servers worldwide, IDC research shows.
- Many IT sites have both HP-UX and Sun Solaris operating systems installed. If only Solaris is installed in a site, Sun has an edge; in mixed sites, the future choice of Unix/RISC servers is highly competitive.
- HP has an edge in sites where the customer plans to migrate from HP's PA-RISC microprocessors to Intel Itanium processors. HP Superdome customers have the option of switching from PA-RISC to Intel McKinley-generation IPF processors in CY02.

### ***Competing with Fujitsu-Siemens***

Fujitsu-Siemens offers several server products, including one that runs on Sun's Solaris/SPARC architecture, that compete in the high-end arena. Fujitsu's high-end servers include both proprietary and Unix/RISC system designs. These systems are targeted for commercial, technical, and scientific applications.

Fujitsu-Siemens' BS2000/OSD systems use CMOS technology in an IBM-compatible System/390 mainframe architecture. Starting at \$2 million, the S-family can be configured with up to 14 CPUs and is priced at approximately \$12 million. It is equipped with a hot-spare CPU, which in the event of a CPU failure is activated to maintain system performance.

In the Unix/RISC server market, Fujitsu-Siemens has two offerings: its older RM-class Unix/RISC servers, which are based on the 64-bit MIPS RISC microprocessors and the former Siemens' Reliant Unix operating system, and the newer PRIMEPOWER series, which runs

on the company's variant of Sun's SPARC RISC architecture and on Sun Solaris. The RM-class systems, which can be clustered to create very large computing configurations with 128+ processors, are no longer actively marketed, although Fujitsu-Siemens continues to support its installed base.

On July 16, Fujitsu Technology Solutions, with North American offices in Sunnyvale, California, announced general availability of the 128-processor PRIMEPOWER 2000 high-end Unix server, which was originally announced in March 2001 and is also sold by Fujitsu-Siemens in Europe. Each of the system's microprocessors is a 563MHz SPARC64-GP processor. These processors are binary compatible with Sun's UltraSPARC II and UltraSPARC III processors, but they are made in a separate process by Fujitsu Ltd., which owns the Fujitsu Technology Solutions business unit. The PRIMEPOWER 2000 system runs several versions of Sun's Solaris server operating system, including Solaris 2.6, Solaris 7, and Solaris 8.

The PRIMEPOWER 2000 will compete most heavily with Sun's Sun Fire 15000, which has up to 72 processors, and Sun's Enterprise 10000, which has up to 64 processors. But it will also compete with HP's high-end Superdome server, which has up to 64 processors, and with IBM's soon-to-be-announced Regatta system. Further, all of these systems are sold in clustered configurations that include multiple server nodes.

The PRIMEPOWER 2000 system will be sold as part of end-to-end total solutions for enterprise resource planning (ERP), such as the packaged software from SAP AG. It can also be a platform for scalable databases, other packaged business solutions (such as CRM, MRP, and HR), server consolidation, and data warehouse and business intelligence applications.

The Sun Fire 15000's new UltraSPARC III microprocessors require the use of Solaris 8. However, Fujitsu Technologies believes that its customers will like the PRIMEPOWER 2000's ability to run older versions of Solaris, in addition to Solaris 8, within the server's partitions. On a technical level, Fujitsu Technologies' previous experience with partitioning technology and with managing multiple workloads should help it to compete effectively with partitioned high-end Unix servers from other vendors, IDC believes. However, the company must work to make its new brand name, along with the specifications of its new 128-way server, better known to IT managers through a new round of advertising and marketing efforts. This could happen as a continuation of a Fujitsu brand-name campaign that began earlier this year, IDC believes.

### ***Competing with Unisys***

In the high-end server space, Unisys has two families — the ClearPath Plus family and the ES7000 with Cellular Multiprocessing (CMP) architecture — running different operating systems.

The ClearPath Plus CS7802 server supports the OS 2200 operating system for midrange and high-end models, whereas the CS7101 server supports the MCP operating system for midrange models.

Unisys has been attempting to merge the CMP and ClearPath product lines by having proprietary chips in the same machine, and the CS7802 is the first machine in the Unisys high-end product line that accomplishes this.

The CS7802 can be configured with up to 32 processors that can be a combination of the Unisys-designed CMOS processors and Intel processors. This system is the first Unisys server offering that combines Unisys-designed processors and Intel processors on the same backplane/busing architecture. The CS7802 offers heterogeneous multiprocessing, which enables the integration of the OS 2200 and Microsoft Windows operating environments via high-speed interconnects and a suite of middleware.

Unisys' CMP is a proprietary architecture that was developed by Unisys to run industry-standard operating systems on Intel-based processors. Currently, the ES7000 uses Intel 32-bit microprocessors and runs Microsoft Windows 2000 Advanced Server, Microsoft Windows 2000 Datacenter Server, and SCO UnixWare 7.

Although the ES7000 system uses 32-bit processors today, it will support 64-bit Itanium Processor Family (IPF) microprocessors next year. Both the 32-bit and 64-bit Intel processors will be able to run in the same machine, although the 32-bit chips and the 64-bit chips must run in separate partitions on the same machine.

## **Conclusion**

Sun plans to leverage its new StarCat system to build on five years of success with its popular StarFire system. It plans to grow high-end server sales by server consolidation and by targeting IBM-compatible servers for replacement by Sun's new high-end servers. At the same time, Sun will continue to compete with its strongest Unix server competitors, HP and IBM, for future high-end Unix/RISC server sales worldwide.

There will be many challenges this time around: Sun energized the high-end Unix server market with its new 64-processor design in January 1997. It was a well-balanced, extremely scalable system that gave big users lots of headroom for growing applications and databases. This time, StarCat represents a product transition from older Sun technology (UltraSPARC II chips and Solaris 2.6 or Solaris 7) to new technology (UltraSPARC III and Solaris 8) that is extremely capable and reliable.

With smart marketing and a creative trade-in/trade-up program, Sun can do much to encourage early sales for StarCat. But a flagging economy, the social uncertainty created by the recent tragedies at the World Trade Center and the Pentagon, and tight IT budgets may act to slow a quick ramp-up of this highly sophisticated high-end server system.

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