Sun Fire X2100 M2 Server

More for your Money: Richly featured, highly scalable, economically priced 1S entry server. Offers IMPI v2.0 service processor and remote management capability standard with leading network connectivity and expandability, and greater scalability in small clusters than Intel Xeon systems.

Sun Fire X2200 M2 Server

Outstanding scalability, industry-leading memory capacity – ideal price/performance for memory-intensive HPC computing, simulations and modeling, and web infrastructure applications.

Just the Facts, 12/09/08

SunWIN Token # 478548

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Dedication

The author would like to thank her dog, Kelly, for her morale support, during the many late night night sessions incurred during the production of this document. In addition, this document is owed in great part to the many talented team members I've been lucky enough to have on this program.

The author also welcomes comments and suggestions: **susan.pommer@sun.com**

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Sun Fire X2200 M2 Server: Outstanding scalability coupled with industry-leading memory capacity make it an ideal price/performance choice for memory-intensive HPC computing, simulations and modeling, and web infrastructure applications.

What's new...

July '07: Toolless rack mount kit announced.

Q1/Q2FY08: Sun Fire X2100 M2 adds support for the AMD Opteron 1222 processor; ATO processor and new standard configuration announced. Sun Fire X2200 M2 adds support for the AMD Opteron 2222 processor as an ATO processor.

March 08: Sun Fire X2100 M2 and X2200 M2 support for x-option (only) 1 TB 7200 rpm SATA II drives.

April 08: 65nm AMD Opteron Quad Core (Barcelona) support for the Sun Fire X2200 M2 server.

December 08: 45nm AMD Opteron Quad Core (Shanghai) support for the Sun Fire X2200 M2 server

Positioning

Introduced in August 2006, the Sun Fire™ X2100 M2 and Sun Fire™ X2200 M2 servers turned up the heat on the highly competitive market for scale-out systems for the data center. Both servers are an ideal fit for all scale-out applications, such as intensive high performance computing, web services -- or wherever the customer invests in performance in preference to hardware redundancy.

The Sun Fire™ X2200 M2 server offers outstanding price-performance and industry-leading memory capacity and expandability in a 1 RU non-redundant 2-socket system. Quad core support is planned for H2FY08 and will enable extremely competitive performance to competitive Intel Quad Core systems.

The Sun Fire X2100 M2 server further extends Sun's leadership in single processor price/performance, bringing a new sub-$750 price point and including standard a service processor with full remote system management.

In addition to utilizing Advanced Micro Devices (AMD) Opteron processors, these servers include standard energy-conscious DDR2 memory, high performing PCI-Express I/O slots and an on-board Service Processor with embedded Lights Out Management for full remote management functions.

Supporting the Solaris™ Operating System (OS), Linux and Windows operating systems, both the Sun Fire X2100 M2 and Sun Fire X2200 M2 servers enable customers to run existing 32-bit x86 OS and applications on the same hardware as they migrate to a wide selection of 64-bit operating systems and their choice of applications. The Sun Fire X2200 M2 server is also planned to support of VMware[1], enabling virtualization of applications for increased application security and higher system utilization.

AMD Opteron processors, offering a built-in memory controller, consistent thermal power requirements and low power options, coupled with DDR2 memory, result in lower system power requirements and operational costs than competitive products using Intel Xeon processors. Quad core AMD Opteron processors will feature the same, consistent socket design and thermal envelope, making dual core systems easily upgradable to Quad Core performance with simple changes, thus reducing data center churn and acquisition costs.

An IMPI 2.0 compliant service processor with embedded Lights Out Management (LOM) enables system management with remote power control and monitoring capabilities. Sun xVM Ops Center supports the Sun Fire X2100 M2 and Sun Fire X2200 M2 servers, enabling rapid discovery, configuration and provisioning of groups of Sun servers, and simplifying datacenter management tasks by enabling remote power control, OS patching and monitoring.

For more information see:

Sun Fire X2100 M2: **http://www.sun.com/servers/entry/x2100**
Sun Fire X2200 M2: **http//www.sun.com/servers/x64/x2200**

[1] See Operating System Support matrix at: **http://www.sun.com/servers/x64/x2200/os.jsp**

Features, Functions, and Benefits

Key Features, Functions, and Benefits

Feature	Function	Benefit
Performance		
AMD Opteron Processors	• Native dual core and quad core designs. • Delivers both 32- and 64-bit enterprise-class computing. • Common socket design and similar thermal envelopes for dual and quad core processors. • AMD Direct Connect Architecture • AMD Virtualization™ Technology	• Nearly doubles computing resources without power and cooling increases • Increases performance while providing investment protection for existing 32-bit application. • Reduces data center churn with easy upgrades for increased performance. • Integrated Memory Controller improves performance by more effectively handling the memory. • Direct Connect Architecture helps guests run at near-native speed in virtualized environments.
HyperTransport Technology and Integrated 128-bit wide DDR2 Memory Controller	• Provides a high-speed connection between processor and core logic. • Integrated controller pools memory resources onto a single coherent space.	• Eliminates performance bottlenecks found in traditional x86 Front Side Bus (FSB) architectures. • Reduces power requirements of server by eliminating the need for a separate memory controller chip. • Reduces memory bandwidth latency.
Power		
Energy Efficiency	• Consistent processor thermal/power requirements • Integrated Memory Controller • DDR2 memory • PowerNow! Technology: dynamic processor voltage and frequency throttling technology which works with server BIOS and operating system	• Eliminates need to upgrade data center power requirements when increase performance. • Lower system power requirement as an additional memory controller chip is not required. • DDR2 memory requires less power than FBDIMM required with Intel Xeon servers. • When using a system and OS which support PowerNow! technology, power consumption be further minimized.
DDR2 Memory	• Proven, cost-effective technology	• DDR2 memory has been in the marketplace for years and is a very stable design and continues to drop in price.
Sun Fire X2200 M2 supports up to 64GB of ECC memory	• Supports memory-intensive applications in a low-cost platform.	• Improves application performance.
Operating System and Management Environment		

Feature	Function	Benefit
Sun Support for: • Solaris 10 OS on x64 • RHEL 4 or 5 • SLES 9 or 10 Linux • Windows Server 2003 or 2008 • VMware (Sun Fire X2200 M2 only)	• Run applications on industry standard platform using OS of choice. • Application portability across the entire family through binary compatibility. • Run applications in a virtualized environment.	• Maximize application performance • Ease transition to 64-bit computing • Maximize IT investment by standardizing hardware to reduce required training and spares • Hardware-assisted virtualization to increase security and utilization.
Tools and Drivers CD	• Provides tools to flash BIOS, run diagnostics and aid in operating system installation	• Simple installation of supported operating systems • Straight forward system-level diagnostics package
Broadcom NetXtreme Software is included on Tools and Drivers CD (for use with 32-bit Windows operating systems)	• Allows administrators to obtain status reports on all LAN adapters and controllers	• Confirm connectivity with remote users • Quickly diagnose and rectify nearly all network related problems • Perform CAT5 cable characterization analysis • Implement teaming, load balancing, fault tolerance or VLAN tagging
Embedded Lights Out Management	• On-board Service Processor. Provides IPMI 2.0 in-band and out-of-band management • Provides similar functionality to Sun Fire X4100/X4200 server ILOM	• Provided as a core part of the system – no extra charge. • Enables remote power control, KVM, remote media (DVD, CD, floppy), and monitoring of key hardware components. • Allows centralized management through management tools such as Sun xVM Ops Center software. • Enables easy integration into customers' existing management environments.
Sun xVM Ops Center	• Optional software provides complete hardware life cycle management for Sun systems from a single central console Functions include: • Bare-metal discovery • firmware updating • OS patching • OS Provisioning • Monitoring • Event logging	• Reduces total cost of ownership and increases efficiencies of managing groups of Sun systems (supports SPARC and x64 systems). • Provides fast and easy access to systems for monitoring and maintenance from a single centralized console. • Enables 'one to many' grouped commands, vastly reducing administrator overhead. • Easily integratable with enterprise management tools.
Expandability with Reliability		
PCI Express Slots	• Allows connectivity to additional network or storage while supporting full CPU path bandwidth.	• Enables flexibility to meet evolving business and application requirements.

Feature	Function	Benefit
DDR2/667 memory with ECC	• ECC provides automatic single-bit error correction.	• Increases memory reliability, helping to reduce the chances of system downtime caused by memory failures.
Integrated Quad Gigabit Ethernet ports	• Outstanding network I/O performance. • Increased network availability when installed in failover configurations.	• Increases network efficiency, flexibility, and availability.

Service Processor – Further Information

The Sun Fire X2100 M2 and Sun Fire X2200 M2 servers feature an ASPEED AST2000 Service Processor with embedded Lights Out Management capability. This service processor differs from ILOM found in the Sun Fire X4100 and X4200 servers, but offers similar remote management functionality:

Feature	***Service Processor with embedded LOM (X2100 M2/X2200 M2)***	***Sun ILOM (Sun Fire X4100, X4200)***
Remote Power/power cycle systems	Yes	Yes
Monitor key system components (CPU, Voltages, Chassis temperature, fans)	Yes	Yes
Comprehensive hardware monitoring	Yes	Yes
DMTF SMASH CLI command set	Yes	Yes
Serial & Network Access	Yes	Yes
Dedicated Management Port	Yes[1]	Yes
Serial-Over-LAN support (SOL)	Yes	Yes
SSH support	Yes	Yes
Console Redirection	Yes	Yes
Comprehensive Browser interface	Yes	Yes
Remote KVM	Yes	Yes
Remote Media capability (DVD, CD, Floppy)	Yes	Yes
Simple GUI or CLI driven BIOS and firmware upgrade procedure	Yes	Yes
IPMI 2.0 support	Yes	Yes
SNMP support	Yes	Yes
In-band management/monitoring	Yes	Yes

(1) User may opt to dedicate the Ethernet port to the service processor or share with the operating systems.

- For more information on the Sun Fire X2100 M2 and Sun Fire X2200 M2 servers' service processor capabilities and usage guidelines, see the Service Processor section in the **Product Release Notes** or **Service Processor Administration Guide** available at **sun.com/documentation or http://docs.sun.com/app/docs/coll/x2200m2**

Product Family Placement

The entry-level members in Sun's x64 server family, the Sun Fire X2100 M2 and X2200 M2 servers, are the price/performance solution for customers who maximize their computing resources with limited budgets through scale-out technologies rather than server-based (e.g. PSUs/fans) redundancy.

The Sun Fire X2100 M2 server, with dual core AMD Opteron processors and onboard IMPI 2.0 compliant Service Processor standard, is an enhanced replacement for the Sun Fire X2100 (“Aquarius”) server.

The Sun Fire X2200 M2 is an addition to the x64 rack-mount server product line, ideal for those customers seeking a 1 or 2-socket server with large memory capacity for data and compute intensive applications or simulations.

X64 Server Family Comparison

The following table compares some features of the Sun Fire X2100 M2, Sun Fire X2200 M2, Sun Fire X4100 and the Sun Fire X4150 servers.

	Sun Fire X2100 M2	**Sun Fire X2200 M2**	**Sun Fire X4100 Server**	**Sun Fire X4150 Server**
CPU type	1-socket, AMD Opteron 1000 Series Dual Core processors	1- or 2-socket, AMD Opteron 2000 Series dual core processors (Santa Rosa), 65nm quad core processors (Barcelona), 45nm quad core processors (Shanghai) planned December 9 2008.	1- or 2-socket, AMD Opteron dual core processors (Santa Rosa), 65nm quad core processors (Barcelona), 45nm quad core processors (Shanghai) planned December 9 2008.	1- or 2-socket Intel Xeon dual-core processors (Wolfdale) and quad-core processors (Harpertown)

	Sun Fire X2100 M2	Sun Fire X2200 M2	Sun Fire X4100 Server	Sun Fire X4150 Server
CPU speed	1222 (3.0 GHz), 1220 (2.8 GHz), 1218 (2.6 GHz), 1210 (1.8 GHz)	**Dual Core (Santa Rosa)** 2222 (3.0 GHz), 2220 (2.8 GHz, 2218 (2.6 GHz), 2218 (HE (2.6 GHz, 55W ACP), 2210 (1.8 GHz) **65nm Quad Core (Barcelona)** 2356 (2.3 GHz), 2354 (2.2. GHz), 2347 HE (1.9 GHz), 2346 HE (1.8 Ghz) **45nm Quad Core (Shanghai)** 2384 (2.7 GHz), 2376 (2.3 GHz)	See X4100/X4200 JTF or sun.com product page for more specifics on supported processors	See X4150 JTF or sun.com product page for more specifics on supported processors
Cache	1 MB Level 2 cache per core. No L3	**Dual Core (Santa Rosa)**: 1 MB Level 2 cache per core. No L3 **65nm Quad Core (Barcelona)**: 512KB Level 2 cache per core. 2MB L3 **45nm Quad Core (Shanghai):** 512KB Level 2 cache per core. 6MB L3	See X4100/X4200 JTF or sun.com product page for more specifics on supported processors	Varies by processor model number; see sun.com product pages for more information
CPU interconnect	HyperTransport@ 24 GB/s peak bandwidth per processor @ 1000 MHz	HyperTransport@ 24 GB/s peak bandwidth per processor @ 1000 MHz	HyperTransport@ 24 GB/s peak bandwidth per processor @ 1000 MHz	Front Side Bus – processor dependent: 1066/1333MHz; see sun.com product pages for more information

	Sun Fire X2100 M2	Sun Fire X2200 M2	Sun Fire X4100 Server	Sun Fire X4150 Server
Maximum memory	Up to 8 GB of unbuffered DDR2-667 ECC memory; 4 DIMM slots per CPU, 512 MB, 1GB and 2GB 667 MHz supported.	Up to 64 GB of registered ECC DDR2-667 memory, 8 DIMM slots per CPU, 2GB and 4GB 667 MHz supported. If more than 4 DIMM per CPU used, memory clocks down to 533 MHz.	Up to 32 GB of memory, 4 DIMM slots per CPU, 2GB and 4GB 667 MHz supported.	Up to 128 GB of registered ECC Fully Buffered (FB) memory, 8 DIMM slots per CPU, 2GB, 4GB, and 8GB 667MHz supported.
Graphics Controller	ASpeed AST2000	ASpeed AST2000	ATI Rage XL	ASpeed AST2000
Internal HDDs	Up to two 3.5" SATA or SAS drives. All drives are hot-pluggable. Use of SAS drives requires SAS HBA: SG-(X)PCIE4SAS3-Z	Up to two 3.5" SATA or SAS drives. All drives are hot-pluggable. Use of SAS drives requires SAS HBA: SG-(X)PCIE4SAS3-Z	Up to two (w/ DVD-ROM) or four (w/o DVD-ROM) 2.5" SAS HDDs Hot-swappable	Up to eight 2.5" SAS HDDs with add-on SAS HBA (SG-(X)PCIE8SAS-I-Z) Hot-swappable SATA drive support under testing.
Disk Drive Capacity	250 GB, 500 GB, 750 GB or 1 TB 7,200 RPM SATA; 146 GB or 300 GB 15,000 RPM SAS with optional SAS HBA	250 GB, 500 GB, 750 GB or 1 TB 7,200 RPM SATA; 146 GB or 300 GB 15,000 RPM SAS with optional SAS HBA	72 GB or 146 GB 10,000 RPM SAS	72 GB or 146 GB 10,000 RPM SAS
On-board RAID (two drives req'd)	RAID 0/1 with optional SAS HBA (SG-(X)PICE4SAS3-Z)	RAID 0/1 with optional SAS HBA (SG-(X)PICE4SAS3-Z)	Onboard Striping, Mirroring (RAID 0, 1)	RAID 0/1/5/6/10 with optional SAS HBA (SG-(X)PICE8SAS-INT-Z
Network connections	Integrated Quad Gigabit Ethernet	Integrated Quad Gigabit Ethernet	Integrated Quad Gigabit Ethernet	Integrated Quad Gigabit Ethernet
Removable media	DVD-ROM or CD+/-RW/DVD-ROM	DVD-ROM or CD+/-RW/DVD-ROM	DVD-ROM or CD+/-RW/DVD-ROM	DVD+/-RW

	Sun Fire X2100 M2	Sun Fire X2200 M2	Sun Fire X4100 Server	Sun Fire X4150 Server
Expansion Slots	Standard: Riser card assembly with 2x 8-lane PCI-Express slots Accepts low profile, half length cards Optional: Riser card assembly with 1x 16-lane PCI-Express slot. Only supported x16 card is PCI card needed for NVIDIA QuadroPlex system	Standard: Riser card assembly with 2x 8-lane PCI-Express slots Accepts low profile, half length cards Optional: Riser card assembly with 1x 16-lane PCI-Express slot. Only supported x16 card is PCI card needed for NVIDIA QuadroPlex system	2x internal PCI-Express low-profile 8-lane slots	3x internal PCI-Express low profile 8-lane slots (all with x16 mechanical connector)
Integrated Service Processor	Yes, IPMI 2.0	Yes, IPMI 2.0	Yes, IPMI 2.0	Yes, IPMI 2.0
In-band management	IPMI v2.0 via KCS driver SNMP OS-resident agent	IPMI v2.0 via KCS driver SNMP OS-resident agent	IPMI v2.0 via KCS driver SNMP OS-resident agent	IPMI v2.0 via KCS driver SNMP OS-resident agent
Out-of-band management	IPMI v2.0;DMTF SMASH CLI; SNMP- v1, v2c, v3; Web GUI	IPMI v2.0;DMTF SMASH CLI; SNMP- v1, v2c, v3; Web GUI	IPMI v2.0;DMTF CLI; SNMP- v1, v2, v3; Web GUI	IPMI v2.0; full DMTF CLI; SNMP- v1, v2c, v3 for system monitoring Web GUI
Remote management features	Secure remote access using Web Interface over SSL or CLI over SSH. Full lights-out remote management using remote keyboard and mouse, remote CD/DVD-ROM and remote graphics. Plus remote KVM & media capabilities.	Secure remote access using Web Interface over SSL or CLI over SSH. Full lights-out remote management using remote keyboard and mouse, remote CD/DVD-ROM and remote graphics. Plus remote KVM & media capabilities.	Remote Keyboard, Video, Mouse (KVM), and remote media capability Video redirection, Remote power control, remote access to BIOS, remote FRU status	Full remote management with full Keyboard, Video, Mouse, Video, Storage (KVMS), and remote media capability (floppy, CD, etc.), remote FRU status

	Sun Fire X2100 M2	Sun Fire X2200 M2	Sun Fire X4100 Server	Sun Fire X4150 Server
System management paths	Uses one of four 10/100/1000 Base-T Gigabit Ethernet Network ports	Uses one of four 10/100/1000 Base-T Gigabit Ethernet Network ports	A single dedicated management 100BaseT port, system serial port and four system Ethernet ports	A single dedicated management 100BaseT port, system serial port and four system Ethernet ports
Rack unit height	1 RU	1 RU	1 RU	1RU
Depth	25.0 inches 633.7 mm	25.0 inches 633.7 mm	25.2 in. 640 mm	28 in. 711.2 mm
Power supply	Single, non hot swappable, 345W	Single, non hot swappable, 450 W	Redundant, Hot-swappable, 550 W each	Redundant, Hot-swappable, 650 W each
O/S	See http://www.sun.com for latest operating system support for each product			

Target Users

Sun Fire X2100 M2 and Sun Fire X2200 M2 servers target customers requiring low-cost, non-redundant, high performance servers with full remote management capability. Offering 8 DIMM slots per processor and total maximum memory capacity of 64GB, the Sun Fire X2200 M2 server will be particularly attractive to customers running memory intensive applications.

Vertical Markets

- Financial Services
- Oil & Gas
- MCAD/EDA
- Education
- Internet/Web 2.0

Horizontal Markets

- Financial Modeling
- Graphical Simulations, visualization
- HPC/Grid and Technical computing
- R&D
- Web, memcache and database tiers; boot node for JBODs

Competitive

Please ask your Sun Sales representative for the Sun Fire X2100 M2 and Sun Fire X2200 M2 server Competitive Matrix posted on their OneStop product pages. These matrices will be updated quarterly, or as new competitive products are introduced.

Availability

Sun Fire X2100 M2 and Sun Fire X2200 M2 Servers were revenue released in Q1FY07. At initial RR, only PTO standard configurations were available, with General Availability of PTO standard configurations

lagging their Revenue Release by one month. Customer-specific ATO configurations lagged the RR of PTO standard configurations by one month to help provide a smoother production ramp. GA of Customer-specific ATO configurations will lag their RR by one month.

45nm Quad Core (Shanghai) Availability

Opteron Model 2384 and 2376 Quad Core ATO processors, standard configurations and Upgrade Kits for the Sun Fire X2200 M2 server will be revenue release ready on 12/09/08 and inventory is being built to stock. Sun is currently accepting pre-release orders under NDA until presto announcement on 12/09/08.

GA date is TBD

See more information in: Ordering Information. Final pricing for standard configurations and ATO processor options is available under NDA from Sun's Area Business Managers (ABM) and/or field finance.

Enabling Technology

AMD Opteron Processor Basics

Dual and quad core AMD Opteron processors leverage the same proven Direct Connect Architecture and CMP (Chip-level Multi-Processing) designs originally featured in the first-generation AMD Opteron processor design, including:

- Native multi-core design incorporates two or four processor cores, for dual and quad core processors respectively, on a single die of silicon
- Similar thermal design power (TDP) envelopes – Dual and quad core Opteron processors maintain the same socket and similar thermal envelopes, enabling a seamless upgrade path.
- 64-bit operating systems to provide full, transparent, and simultaneous 32-bit and 64-bit platform application multitasking
- AMD HyperTransport™ Technology
  - Provides a scalable bandwidth interconnect between processors, I/O subsystems and other chipsets
  - The 2000 Series Opteron processors have three coherent HyperTransport links providing up to 24.0 GB/s peak bandwidth per processor.
- Dual core processors (Santa Rosa) offer dedicated 1MB L2 Cache per core and no L3 Cache; 65nm quad core processors (Barcelona) offer 512KB L2 cache per core and 2MB L3 cache per processor; 45nm quad core processors (Barcelona) offer 512KB L2 cache per core and 6MB L3 cache per processor.
- Direct Connect Architecture
  - Addresses and helps reduce the real challenges and bottlenecks of system architecture
  - Memory is directly connected to the CPU, optimizing memory performance
  - I/O is directly connected to the CPU, for more balanced throughput and I/O
  - CPUs are connected directly to CPUs allowing for more linear symmetrical multiprocessing
- Integrated DDR2 Memory Controller
  - A 128-bit wide, on-chip DDR2 memory controller that supports ECC and ChipKill technologies and provides low-latency memory bandwidth which scales as processors are added.

10.7 GB/s @ DDR2-667

24 GB/s @ 1000MHz HyperTransport

Figure 1: Dual Core ("Santa Rosa") AMD Opteron Processor Design for Socket F (1207)

(Note: AMD Opteron 1000 Series processors have one HyperTransport link)

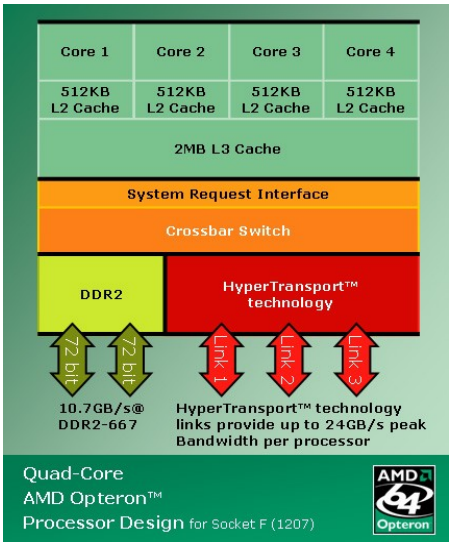
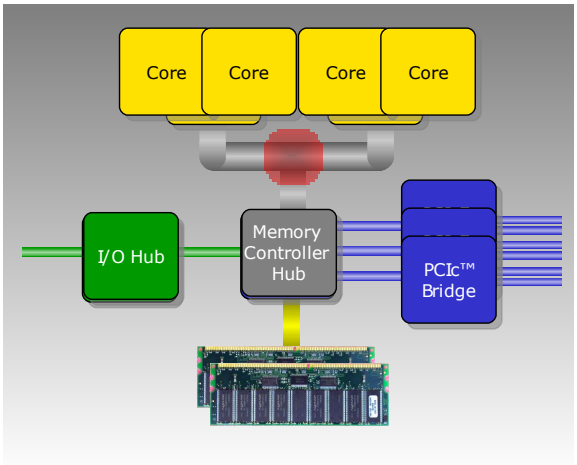


Figure 2: AMD Opteron Quad Core Processor

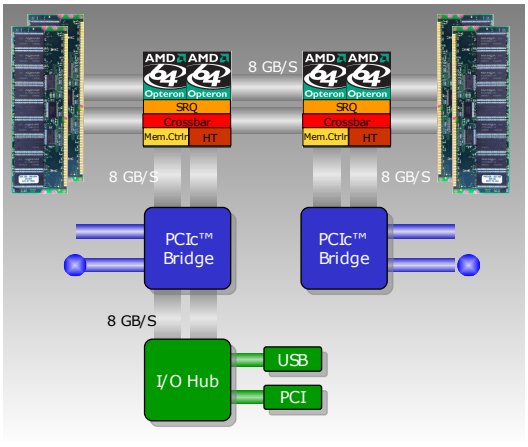
HyperTransport™ Technology

Dual and quad core AMD Opteron processors continues to use HyperTransport Technology links to provide a scalable bandwidth interconnect among processors, I/O subsystems, and other chip sets. HyperTransport Technology:

- Helps increase overall system performance by removing I/O bottlenecks typically found in Front Side Bus (FSB) architectures and efficiently integrating with legacy buses, increasing bandwidth and speed, and reducing latency of processors.
- Provides up to 8 GB/sec. bandwidth per link at 16x16 bits, 1 GHz operation, providing sufficient bandwidth for supporting new interconnects, such as PCI-Express.



Intel's Front-side Bus (FSB) Architecture



AMD Direct Connect Architecture

Figure 3: Intel versus AMD processor Architecture

Intel's Front Side Bus (FSB) architecture requires a separate memory controller. I/O bottlenecks and reduced efficiencies are seen as data from CPU to CPU, CPU to I/O and CPU to memory all funnel through a central Front-Side Bus.

Power Consumption: Thermal Design Power (TDP) & Average CPU Power (CPU)

ACP: AMD Opteron vs. Intel Xeon

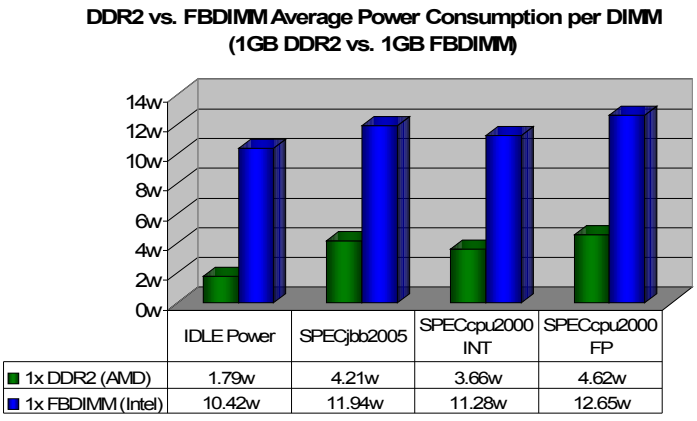
Power consumption is one of today's top customer issues. Thermal Design Power (TDP) is not actual, real world power use, but instead a theoretical maximum used for design reference specifications and in engineering platform thermal design.

Average CPU Power (ACP) captures typical power usage in real-world scenarios and is more relevant to data center planning. As the following chart summarizes, AMD Opteron processors provide leading ACP efficiency while delivering significant performance gains over dual core processors. In addition, AMD Opteron processors include an onboard memory controller, eliminating the need for additional memory controller chips in system designs.

Dual Core AMD Opteron TDP	***Quad-Core AMD Opteron TDP***	***Quad-Core AMD Opteron ACP*** ***(n/a for dual-core)***	***Intel Xeon 5000 Series ACP***
120 W	137 W	105 W (SE processors)	120 W
95 W	115 W	75 W	80 W
68 W	79 W	55 W (HE processors)	50 W

Power Consumption: Supporting Memory Technologies

Intel Xeon 5000 series processors support FB-DIMM; AMD Opteron dual and quad core processors support DDR2 memory. As the following chart indicates, FB-DIMM memory uses more power during both idle and loaded cycles when compared to DDR2 memory technology.

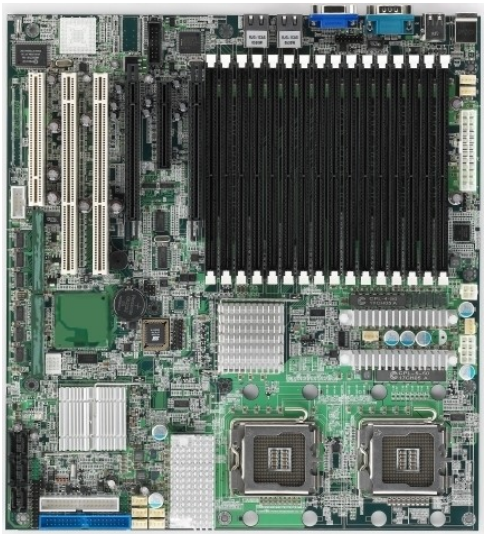


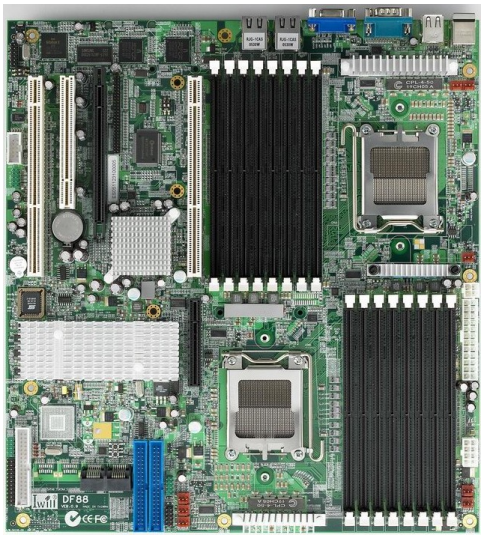
	IDLE Power	SPECjbb2005	SPECcpu2000 INT	SPECcpu2000 FP
1x DDR2 (AMD)	1.79w	4.21w	3.66w	4.62w
1x FBDIMM (Intel)	10.42w	11.94w	11.28w	12.65w

Notes:

- SPECcpu2006 benchmarks under testing
- All testing completed by AMD: Micron DDR2-667 memory, model MT18HTF12872Y-667D6 1 GB, versus ATP FB-DIMM, model AP28K72S8BHE6S 1 GB

Power Consumption: 2-socket AMD vs. Intel Quad Core Systems





The following example details is a typical system by system comparison of power requirements:

	Typical Intel Xeon 5000 Series 2-socket System	***Typical AMD Opteron 2000 2-socket Series System***
Processor	2x 50W ACP per CPU	2x 55W ACP per CPU
Memory	4x 12.65 W per FBDIMM	4x 4.62 W per DDR2
Chipset	32.4 for Northbridge	15 W
	12.4 for Southbridge	---
Total	**195 W; 667 BTU/hr**	**144 W; 493 BTU/hr**
$/year energy costs	274 (US$)	201 (US$)
For 500x servers	136,916 (US$)	$100,511 (US$)

Notes: Energy estimates include power input & cooling at 60%, Power Utility cost: $0.10/KW-hr, based on publicly available processor & chipset specifications and AMD internal estimates. The examples contained herein are intended for informational purposes only, actual results will vary. Other factors will affect real-world power consumption and cost.

AMD PowerNow™ Technology

AMD PowerNow™ is a dynamic processor voltage and frequency throttling technology that works in conjunction with a server's BIOs and the operating system to minimize power consumption under less than maximum workloads.

For AMD PowerNow technology to work, **both the operating system and server BIOS must be qualified to run AMD's PowerNow**. Please see below for specific product support.

For both the Sun Fire X2100 M2 and Sun Fire X2200 M2, the **PowerNow is disabled** by default.

The **Sun Fire X2100 M2** and the following operating systems support AMD's PowerNow technology:

Operating System	Versions	Support for AMD PowerNow
Solaris x64 10u2 and up	32 & 64-bit	No
RHEL 4u4 and up	32 & 64-bit	Yes*
RHEL5	32 & 64-bit	Yes*
SLES 9, SP3 and up	64-bit	Yes
SLES 10, SP1 and up	64-bit	Yes
Windows 2003, SP1	32 & 64-bit	Yes
Windows 2008	32 & 64-bit	Yes

* 32-bit requires power module installation (2 commands). See X2100 M2 **Product Release Notes** for more information.

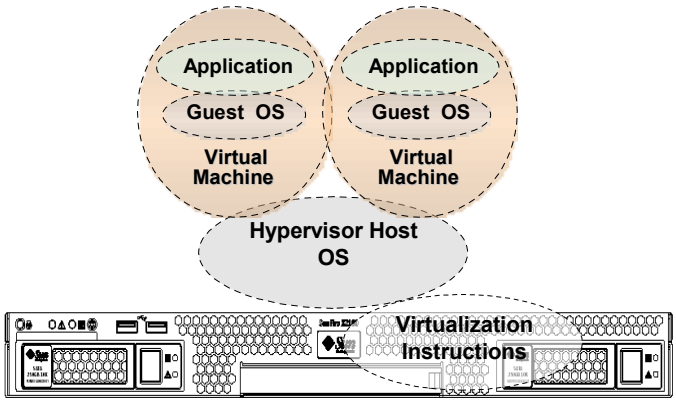
The **Sun Fire X2200 M2** and the following operating systems support AMD's PowerNow technology:

Operating System	Versions	Support for AMD PowerNow
Solaris x64 10u5	32 & 64-bit	S10U5 (April 2008) as support for **Quad Core AMD Opteron processors (only)**
RHEL 3u8 and up	32 & 64-bit	unknown
RHEL 4u4 and up	32 & 64-bit	Yes - dual core systems require BIOS 3B25 or greater
RHEL5	32 & 64-bit	Yes - dual core systems require BIOS 3B25 or greater
SLES 9, SP3	64-bit	Yes - dual core systems require BIOS 3B25 or greater
SLES 10	64-bit	Yes - dual core systems require BIOS 3B25 or greater
Ubuntu 8.04 LTS	64-bit	Unknown
Windows 2003, SP1	32 & 64-bit	Yes
Windows 2008	32 & 64-bit	Yes

Solaris Support for PowerNow!

There is no planned Solaris PowerNow support planned for dual core AMD Opteron processors.

AMD Virtualization™ Technology



Virtualization enables data centers to achieve higher levels of efficiency, utilization and flexibility by dividing a computer into several virtual machines or consolidating many systems onto one virtual machine.

Hardware-enabled AMD Virtualization™ offers:

- Reduces complexity of virtualization software by adding instructions to the hardware
- Reduces overhead by selectively intercepting information destined for guest OS's
- Enables simpler implementation and support by allowing guest OS's to run unmodified.
- Improves security of virtual machines by increasing isolation of host and guest OS's.
- Improves efficiency of switching between hypervisor and guest OS's through tagged TLB memory architecture.

AMD Virtualization versus Intel VT

- AMD's Direct Connect Architecture helps guests run at near-native speed. In shared FSB architectures, the FSB can become the bottleneck, decreasing guest applications performance.
- Intel's separate Memory Controller Hub is not virtualization-aware, so software must drive more memory management. AMD's memory controller is integrated into the processor and is virtualization-aware, providing better isolation of virtual machine memory resulting in enhanced data speed and security.
- AMD Virtualization utilizes tagged Translation Look-Aside Buffer (TLB) resulting in highly efficient switching between host and guests as the memory architecture selectively flushes data. Intel VT utilizes untagged TLB resulting in less efficient switching between hosts and guests require flushing the entire memory buffer when switching between host and guests.

Quad Core AMD Opteron Benefits

Designed from inception for the most demanding datacenters, quad-core AMD Opteron processors bring significant enhancements to market the following key areas:

1. Energy-Efficiency

- **AMD CoolCore™ Technology** automatically reduces energy consumption and heat generation by turning off unused parts of the processor.
- **Independent Dynamic Core Technology**, an enhancement to AMD PowerNow! technology, allows each core to vary its clock frequency depending on the specific performance requirement of the applications it is supporting, helping to reduce power consumption. Intel Xeon processors, which are not native quad core designs, lock voltage levels for all cores to the highest utilized core's requirements.

2. Investment Protection

- Quad-core AMD Opteron processors (Barcelona and Shanghai) maintain socket compatibility with dual core AMD Opteron processors (Santa Rosa). Quad-Core Thermal Design Power (TDP) increases slightly with quad-core processors (see chart, page 16), but should not significantly change average CPU power and data center power requirements.

3. Virtualization

- Virtualization is memory intensive. Quad core AMD Opteron processors provide exceptional memory throughput through its integrated memory controller.
- The Sun Fire X2200 M2 is planned to support VMware, and with its quad core processors and eight memory slots per processor, is ideal for excellent performance on memory-intensive virtualized applications. See Operating Systems (page 29) for more information.
- **AMD Rapid Virtualization Indexing** (formerly called “Nested Paging”) and Tagged TLBs. AMD’s Rapid Virtualization Indexing feature is designed to reduce the overhead penalty associated with virtualization technologies by moving the process of managing virtual memory from software to hardware, reducing the complexity of existing x86 virtualization solutions and enabling increased performance and efficiency for many virtual workloads, allowing for a higher performing, more flexible IT environment.

4. High-Performance

- **AMD Memory Optimizer Technology** increases memory throughput by up to 50% compared to previous generations of the AMD Opteron processor.
- **AMD Wide Floating Point Accelerator** provides 128-bit SSE floating point capabilities, which enable each core to simultaneously execute up to four FLOPS per clock (four times the floating-point computations of previous AMD Opteron processors) for significantly improving performance in compute-intensive and workstation applications.
- **AMD Balanced Smart Cache** provides significant cache enhancements with 128KB L1 cache and 512KB L2 cache per core and 2MB shared L3 cache across all four cores.

Learn more at:

http://multicore.amd.com/us-en/AMD-Multi-Core/Quad-Core-Advantage/At-Work-AMD-Opteron.aspx

System Architecture

Figure 7: Sun Fire X2100 M2 Server System Architecture

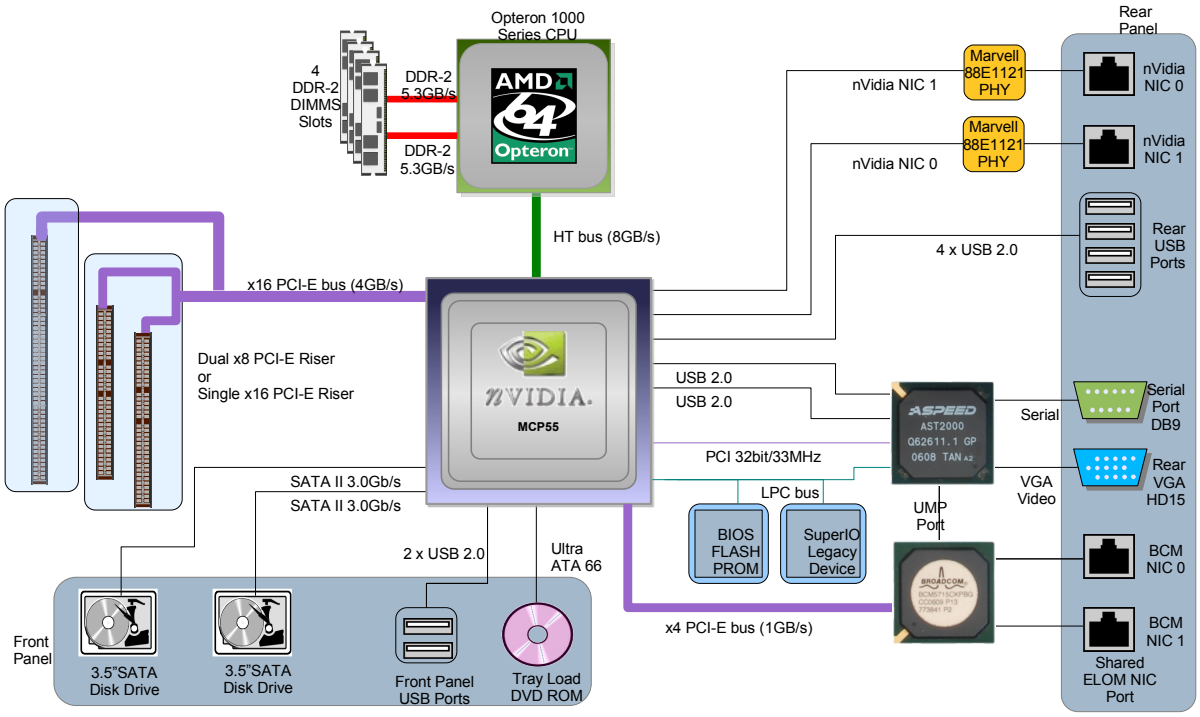
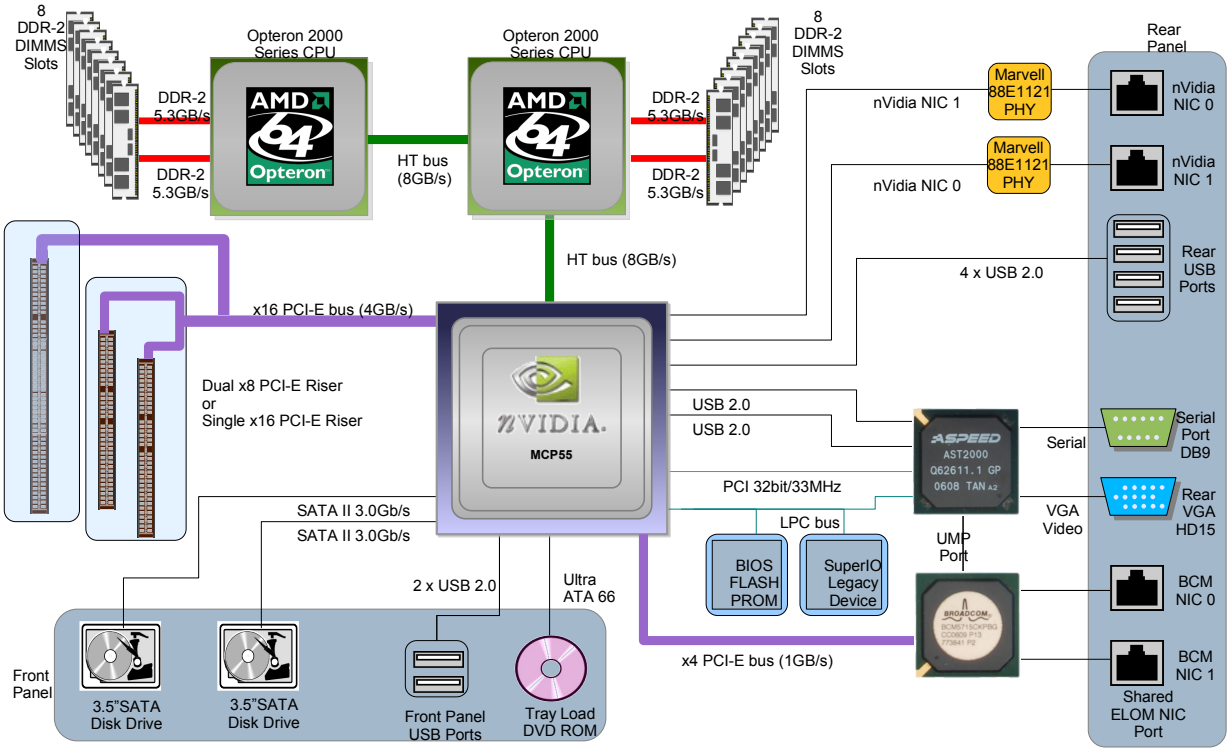


Figure 8. Sun Fire X2200 M2 Server System Architecture



Sun Fire X2100 M2 and Sun Fire X2200 M2 Server System Architecture

The Sun Fire X2100 M2 server features a single CPU socket that supports AMD Opteron 1000 series (AM2 socket) processors. The processor controls 2 pairs of four DIMM slots, with 4.3 – 5.3 GB/s access between processor and memory and one 1GHz 16x16 HyperTransport link from the processor to the NVIDIA NFP 3600 chip set (8 GB/sec. bandwidth).

Use of quad-core AMD Opteron processors with the Sun Fire X2200 M2 server requires motherboard (*motherboard PN:375-3560-01 (or later rev)*) which includes the 1MB flash PROM required to support the larger, quad-core BIOS. Both dual and quad core systems will be built with this motherboard starting in Q1FY09.

Quad-core Upgrade Kits are available to upgrade previously built motherboards include in dual core systems to support quad core processors. These kits include all the parts – 1MB PROM, quad core processors and pregreased heat sinks – tools and instructions to upgrade a dual core Sun Fire X2200 M2 server to quad-core performance.

The Sun Fire X2100 M2 server supports 512 MB, 1 GB and 2GB **unbuffered** DDR2-667 memory. 4 GB DIMM are not on this product's roadmap at this time. Populated with 2 GB DIMMs, the Sun Fire X2100 M2 server supports up to a total of 8 GB of memory.

The Sun Fire X2200 M2 server features two CPU sockets that support AMD Opteron 2000 Series (L1 socket) processors. The server is supported with one or two processors and each processor controls 4 pairs of DIMM slots, for a total of sixteen DIMM in a two CPU system. There is a 4.3 – 5.3 GB/sec. access between processor and memory and one 1GHz 16x16 HyperTransport link between the two processors (8 GB/sec. Bandwidth).

The Sun Fire X2200 M2 server supports 1 GB, 2 GB and 4 GB **registered** DDR2-667 memory, for a system with up to a total of 64 GB of memory. The Sun Fire X2200 M2 server's 1GB DIMM are single rank; 2GB and 4 GB DIMM are dual rank. 8GB DIMM are not on this product's roadmap at this time. **Please note: Sun Fire X2200 M2 server's memory will down-clock to 533 MHz in the BIOS for a system configuration of more than 4 four DIMM per CPU**.

For optimal performance in both servers, memory DIMMs need to be installed in pairs so the processor is able to run in 128-bit ECC mode. Systems with an odd number of DIMMs are supported, but the processor will run in 64-bit ECC mode, reducing performance.

Important Notes:

Sun Fire X2100 M2 and Sun Fire X2200 M2 servers use different processors which are not interchangeable

- Sun Fire X2100 M2 server: AMD Opteron 1000 Series (AM2 socket) processors
- Sun Fire X2200 M2 server: AMD Opteron 2000 Series (L1 socket) processors

Sun Fire X2100 M2 and Sun Fire X2200 M2 servers use different types of memory which are not interchangeable

- Sun Fire X2100 M2 server: unbuffered ECC DDR2-667 memory
- Sun Fire X2200 M2 server registered ECC DDR2-667 memory

Important Ordering/Installing x-option memory:

- Sun purchases memory from multiple vendors and it is not possible to have all vendors qualified, with no issues, on all platforms simultaneously.
- As such, each platform has a unique set of registered ECC DDR2-667 memory marketing part numbers, each representing two or more memory vendors qualified for a subset of Sun platforms.

- When ordering x-option memory, **please use the memory marketing part numbers listed in the Ordering section for each product.**

Chipset

NVIDIA NFP 3600 (MCP55 Pro)

Connected through the HyperTransport to the CPU, NVIDIA's NFP 3600 integrated bridge/controller chip maximizes real estate efficiency with a single-chip low latency design. The chip features three Integrated SATA II controllers, each operating up to 2 disks at 3 Gps each, 28 PCI-Express lanes in flexible configurations, 10 USB 2.0 ports, ATA-133 port, Dual Integrated Gigabit Ethernet NICs, integrated PCI 33MHz/32-bit bus for legacy devices and more. For more information on NVIDIA chips, visit: **http://www.NVIDIA.com/page/nfpro_workstation_features.html**

Designed around this capability, the Sun Fire X2100 M2 and Sun Fire X2200 M2 servers are expected to provide support for up to two 3.5" SATA II disk drives, up to one tray-load optical drive, riser card assembly with 2x 8-lane or 1x 16-lane PCI-Express slot(s), four Gigabit Ethernet ports, six USB 2.0 ports, video output via the AST200 chip, and a serial port. Up to two 3.5" SAS disk drives are also supported with the purchase and installation of an optional SAS 4-port HBA.

ASPEED AST2000 -- Service Processor with embedded Light Out Management

The Sun Fire X2100 M2 and Sun Fire X2200 M2 servers both incorporate standard onboard service processor with embedded Light Out Management. Included in all systems, the Sun Fire X2100 M2 and Sun Fire X2200 M2 servers provides industry standard management interfaces and similar functionality to that found in the Sun Fire X4100/X4200 servers' ILOM.

Remote management is achieved using the NVIDIA NFP 3600 chip with an ASPEED AST200 Baseboard Management Controller (BMC). The BMC firmware is **IPMI v2.0 compliant** and provides the following functions:

- Full local and remote Keyboard, Video, Mouse (KVM) access
- Remote media functionality enabling administrators to select local drives on the network as boot devices for the system (supports floppy, CD and DVD drives)
- IPMI 2.0 and SNMP V3 support for management, monitoring and control, enabling integration into existing management environments
- DMTF SMASH CLI (Command Line Interface)
- Access via Serial Over LAN (SOL), serial port or 10/100 management ports
- Browser based UI
- Monitoring of all components and event logging

Both the Sun Fire X2100 M2 and Sun Fire X2200 M2 servers offer four 10/100/1000 Base-T Ethernet ports. Remote management of these servers requires use of one of the four Network dual port 10/100/1000 Base-T Gigabit. Port sharing is accommodated through use of the UMP port feature of the Broadcom 5715C dual Gigabit Ethernet controller. The ASPEED AST2000 is connected to the UMP port on the BCM5715C, providing an effective 100Mbps Ethernet port to the ASPEED AST2000 with a dedicated MAC and IP address. The BCM5715C then handles filtering and forwarding of the ASPEED AST2000 traffic out of and into the main server stream of traffic over the external facing Gigabit port. The negotiated speed of the external port is not important to the ASPEED AST2000, it always sees a 100Mbps port.

Administrators can manage, monitor and control systems using the onboard service processor, or choose to manage one to hundreds of systems through a hardware life cycle management tool such as Sun xVM Ops Center.

For more information, visit **www.sun.com/documentation** or **http://docs.sun.com/app/docs/prod/server.x64#hic** for the **embedded Lights Out Management Administration Guide** for the Sun Fire X2100 M2 and Sun Fire X2200 M2 servers.

Broadcom Ethernet Controller (BCM5715C)

The Sun Fire X2100 M2 and Sun Fire X2200 M2 servers have selected to incorporate an industry-leading Broadcom Ethernet Controller chip. The Universal Management Port (UMP) interface provided on this chip allows the BMC to be integrated with a Broadcom Ethernet Controller enabling combining of the BMC network management packet traffic with that of the Controller. This integrated design eliminates any requirement for the BMC to provide its own separate physical network connection.

This solution is realized by physically interfacing the BMC Media Access Controller (MAC) to the Broadcom Ethernet Controller via its auxiliary 10/100 Ethernet Port (UMP). The BMC is then logically interfaced to the Broadcom Ethernet Controller using predefined UMP control commands that allow it to configure the Ethernet Controller to control the flow of packets between the BMC and the Controller Gigabit Ethernet port.

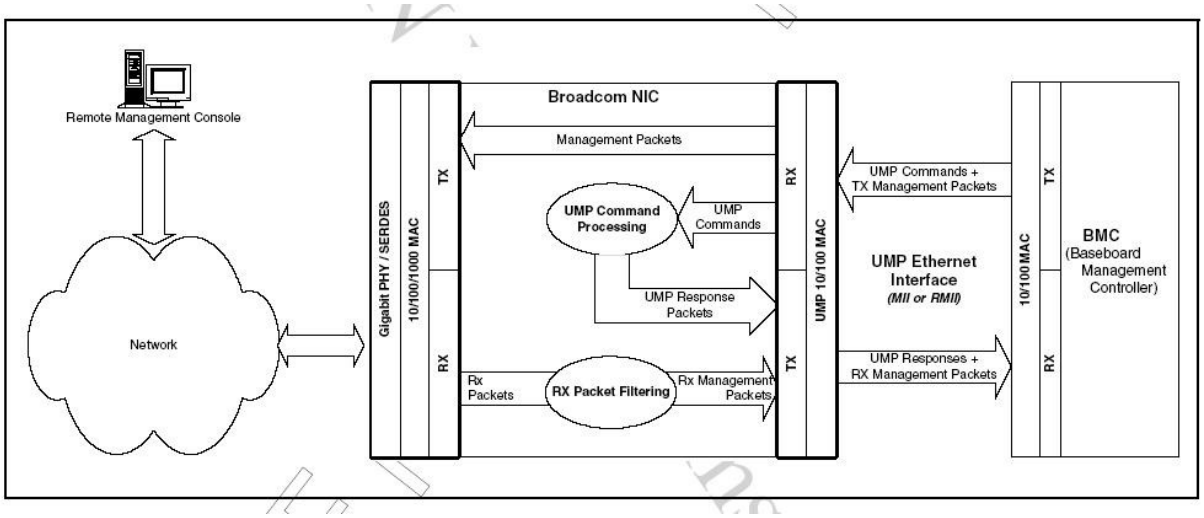


Figure 10. UMP Interface

As shown in the above block diagram, the primary function of the UMP is to provide a TX/RX pass through for management packet traffic flowing between the BMC and remote connections. Once the UMP pass through feature has been activated by enabling the UMP channel, the Broadcom Ethernet Controller will start forwarding eligible packets. One the BMC TX side, the Broadcom Ethernet Controller will forward all non-control command packets received at the UMP RX interface to the primary MAC for transmission onto the wire. On the BMC RX side, the Broadcom Ethernet Controller will route all packets received off the wire and addressed to the BMC, to the UMP TX interface for forwarding to the BMC. The UMP interface is implemented using MII signaling on the server. Furthermore, although it is referred to as a 10/100 Ethernet interface, the UMP link configuration is always fixed at 100 Mbps full-duplex.

Hard Disk Drives

3.5” SATA II and SAS (with optional SAS 4-port HBA) are supported for the Sun Fire X2100 M2 and Sun Fire X2200 M2 servers.

Diskless Standard Configurations: Offering Maximum Configurability

To allow customers and partners maximum flexibility of drive choice and maximum speed of system configuration, most standard configurations are diskless. Hard drives are **hot pluggabl**e and x-options are easy to install from the front of the server. To add SATA II drives to a standard configuration, a customer or partner simply orders the desired drive capacity as an x-option, removes the disk bay filler panel and slides the drive into the disk bay. No tools are required.

SATA II Hard Disk Drives

The Sun Fire X2100 M2 and Sun Fire X2200 M2 servers support up to two internal 3.5" SATA-II disk drives. SATA-II drives are twice as fast (3.0 Gb/sec.) as SATA I drives; however, performance improvements are only seen in multi-disk systems.

Figure 11. Easy-to-Install Disk Drive

SAS Hard Disk Drives

The two internal SATA II channels in the Sun Fire X2100 M2 and Sun Fire X2200 M2 servers are convertible to support 3.5" 146 GB or 300 GB, 15,000 RPM SAS drives through use of an optional 4-port SAS HBA: **SG-(X)PCIE4SAS3-Z.**

- For use of SAS drives in the Sun Fire X2100 M2, the customer/partner needs to purchase the drives and optional SAS HBA noted above. The customer/partner reroutes internal cables during installation.
- For use of SAS drives in the Sun Fire X2200 M2, the customer/partner needs to purchase the SAS drives, optional SAS HBA noted above as well as a SAS cable kit ((X)5295A-Z). The customer/partner removes current cables, and install the new cables in a different routing during installation.

Detailed instructions for installation of SAS hard drives will be added to the Sun Fire X2100 M2 and Sun Fire X2200 M2 servers' **Service Manual** available at **http://docs.sun.com/app/docs/coll/x2200m2**

RAID Support

RAID 0/1

This capability is supported on Sun Fire X2100 M2 and Sun Fire X2200 M2 servers, for both SAS and SATA drives, through the use of a 4-port SAS HBA, marketing part number: **SG-(X)PCIE4SAS3-Z**. This is the only part number supported for RAID on these platforms.

- For use of RAID 0/1 in a Sun Fire X2100 M2, the customer/partner needs to purchase the drives and optional SAS HBA noted above. The customer/partner reroutes internal cables during installation.
- For use of RAID 0/1 in the Sun Fire X2200 M2, the customer/partner needs to purchase the SAS drives, optional SAS HBA noted above as well as a SAS cable kit ((X)5295A-Z). The

customer/partner removes current cables, and install the new cables in a different routing during installation.

- For use of SAS drives in a RAID 0/1 configuration in either server, only one 4-port SAS HBA card is required.

RAID 5/6/10

Require more than two hard drives, so these capabilities are not supported on Sun Fire X2100 M2 and Sun Fire X2200 M2 servers.

Reliability, Availability, and Serviceability (RAS)

Reliability

- Simplicity of system design with the AMD Opteron processors -- integrated Memory Controller architecture and HyperTransport -- requires less components and thus provides higher reliability.
- RAID 0/1 mirroring of the internal drives with optional SAS HBA.
- ECC memory supported

Availability

- The low cost and small form factor of the Sun Fire X2100 M2 and Sun Fire X2200 M2 servers allow redundant system deployment in a compact space to increase overall service availability.
- Built-in quad Gigabit Ethernet ports enable networking redundancy.

Serviceability

- Indicator LEDs on the front and back of the chassis allow problems to be detected and isolated easily.
- A fault indicator LED stays on following a fault even if the system has been powered off (but still connected to the power source).
- Front power switch provides easy access.
- Rackmount slide rails and cable management arm are available as options for easy installation and removal of a unit to a cabinet.

Operating System

Sun Fire X2100 M2 and Sun Fire X2200 M2 Server Operating Systems

The 64-bit Sun Fire X2100 M2 and Sun Fire X2200 M2 servers allow customers to run the operating system that best fits their needs. With a multitude of operating systems fully supported and/or certified, customers have more choices, within the same hardware architecture, than competing servers in the one and two socket classes.

Operating Systems for Dual Core Sun Fire X2100 M2 and X2200 M2 servers.		**Sun Supported**	**Certified by OS Vendor**	**Factory Installed**	**Licenses resold by Sun**
Solaris x64 10u2 and up	64-bit	Yes	Yes	Optional preinstall	No cost
Red Hat Enterprise Linux 3, U8	32-bit, 64-bit	Yes	Yes	CRS[1]	Yes
Red Hat Enterprise Linux 4, U4	32-bit, 64-bit	Yes	Yes	CRS[1]	Yes
Red Hat Enterprise Linux 5	32-bit, 64-bit	Yes	Yes	CRS[1]	Yes
SUSE Linux Enterprise Server 9, SP3 (SLES 9)	64-bit	Yes	Yes	CRS[1]	Yes
SUSE Linux Enterprise Server 10 (SLES 10)	64-bit	Yes	Yes	CRS[1]	Yes
Windows Server 2003, Enterprise and Standard Editions, SP1	32-bit, 64-bit	Yes	Yes [2]	CRS[1]	No, not for these platforms
Windows Server 2008, Datacenter, Enterprise and Standard Editions	32-bit, 64-bit	Coming Soon	Coming Soon	No, not for these platforms	No, not for these platforms
VMware ESX 3.0.2 **(Sun Fire X2200 M2 Dual Core only)**	64-bit	Yes[3]	Yes[3]	CRS[1]	Yes

1. Red Hat Enterprise Linux 3,4 or 5, SUSE Linux Enterprise Server 9/10 and VMware 3.0.2 can be ordered factory installed on these servers through the Sun Customer Ready Systems Program. For a factory installation of any supported Windows Operating Systems, the customer must sign a form confirming they have a volume licensing agreement directly with Microsoft.
2. “Designed for Windows” designation as a certified platform.
3. VMware ESX 3.0 only supports 2 or more sockets; version 3.0.2 qualified **only** for Sun Fire X2200 M2 Dual Core only.

Operating Systems for Quad Core Sun Fire X2200 M2 server		Sun Supported	Certified by OS Vendor	Factory Installed	Licenses Sold by Sun
Solaris x64 10u5	64-bit	Yes	Yes	Optional no-cost preinstall	no-cost
Red Hat Enterprise Linux 4 U5	32-bit, 64-bit	Yes	Yes	CRS[1]	Yes
Red Hat Enterprise Linux 5 U1	32-bit, 64-bit	Yes	Yes	CRS[1]	Yes
SUSE Linux Enterprise Server 9, SP4 (SLES 9)	64-bit	Coming Soon[3]	Coming Soon[3]	CRS[1]	Yes
SUSE Linux Enterprise Server 10, SP1 (SLES 10)	64-bit	Yes	Yes	CRS[1]	Yes
Ubuntu Linux 8.04 LTS	64-bit	No	Yes	No	No
Windows Server 2003, Enterprise and Standard Editions, SP1	32-bit, 64-bit	Yes	Yes[2]	CRS[1]	No, not for these platforms
Windows Server 2008, Datacenter, Enterprise and Standard Editions	32-bit, 64-bit	Coming Soon[3]	Coming Soon[3]	No, not for these platforms	No, not for these platforms
VMware ESX 3.0.2 or ESX 3.5 U1 **(Sun Fire X2200 M2 Quad Core only)**	64-bit	Coming Soon[3]	Coming Soon[3]	CRS[1]	Yes

1. Red Hat Enterprise Linux 4 or 5, SUSE Linux Enterprise Server 9 or 10 and VMware ESX can be ordered factory installed on these servers through the Sun Customer Ready Systems Program. For a factory installation of any supported Windows Operating Systems, the customer must sign a form confirming they have a volume licensing agreement directly with Microsoft.
2. "Designed for Windows" designation as a certified platform
3. Planned late Q4FY08; requires specific BIOS version, see more details at: **http://www.sun.com/servers/x64/x2200/downloads.jsp**

Supported Operating Systems

For the latest status and more information on the OS support, see:

Sun Fire X2100 and Sun Fire X2100 M2 servers:

http://www.sun.com/servers/entry/x2100/os.jsp

http://www.sun.com/servers/x64/x2200/os.jsp

Firmware and Drivers

For the latest firmware and drivers:

http://www.sun.com/servers/entry/x2100/downloads.jsp

http://www.sun.com/servers/x64/x2200/downloads.jsp

Supported I/O Cards and Associated Drivers

For the latest qualification status, associated drives and additional information on supported I/O cards, see:

http://www.sun.com/servers/entry/x2100/optioncards.jsp

http://www.sun.com/servers/x64/x2200/optioncards.jsp

Supported Storage and Associated HBAs

For the latest supported Sun Storage systems and Host Bus Adapters, see:

http://www.sun.com/servers/entry/x2100/storage.jsp

http://www.sun.com/servers/x64/x2200/storage.jsp

Sun xVM™ Ops Manager

Sun xVM Ops Center software, the industry's only complete solution for virtualizing and managing your data center infrastructure for rapid and simplified discovery, OS provisioning and updates and management of multi-vendor Solaris and Linux OS-based x86 and SPARC systems. This optional software combines the benefits of N1 System manager with the administration of virtualized datacenter assets by merging with Sun Connection. Sun xVM Ops Center improves manageability by centralizing control of heterogeneous architectures across the entire IT infrastructure. Learn more at: **http://www.sun.com/xvmopscenter**

Sun xVM Ops Center software provides full Life Cycle management for physical, and soon virtual, data center infrastructure. Highly scalable and built on the proven N1SM and Sun Connection, xVM Ops Center provides End-to-End Systems Management:

- Discover & Inventory
- Check & Provision Firmware
- Bare Metal Provision OS
- Manage Hypervisors
- Provision applications
- Automate software lifecycle/update
- Monitor HW and SW
- Compliance reporting

Solaris™ 10 Operating System – In a Class By Itself

Key Messaging

In a class by itself, the Solaris Operating System is a significant leap forward from the Solaris 9 OS, establishing it in a class by itself when compared to competing operating systems. It offers many innovative technologies that fundamentally change the equation for organizations needing to reduce costs, reduce complexity, and minimize risk. The new features in the Solaris 10 OS bring mainframe-

quality software to even the smallest single-processor servers and provide a stepping stone into tomorrow's data center.

For CIOs and Line of Business Managers dissatisfied with high infrastructure costs and security vulnerabilities in their workgroup server environments, the Solaris 10 OS brings a proven, enterprise-class OS at 1/11th the cost of Microsoft and 20-60% off the cost of Red Hat over three years.

The Solaris 10 OS is designed to help organizations optimize system utilization levels, deliver extreme performance and provide virtually unparalleled security – all with relentless, around-the-clock availability.

- **Optimal Utilization** of computing systems is a priority for IT managers where server consolidation is a common approach and is improved in the Solaris environment by:
    - **Solaris™ Containers** enable as much as a 4x increase in system utilization by making it possible to efficiently and securely support thousands of applications per system. Highly configurable, Solaris Containers can dynamically adjust system resources to business goals within and across Containers with the added benefit of isolating applications from each other and from system faults, so a problem in one application cannot affect the system or other applications.
    - Solaris ZFS (zettabyte file system) integrates devices, storage and filesystems into a single management structure and reduces the amount of effort involved in managing data. ZFS is integrated with the Fault Management Architecture to proactively identify potential faults in the data path and if problems are detected ZFS can initiate corrective action before the data is put at risk.
- **Extreme Performance** as evidenced by over 100 world record benchmarks is delivered with optimization for the latest UltraSPARC(R), AMD Opteron™ and Intel Xeon processors as well as:
    - **Dynamic Trace,** designed for live use in production situations, is a powerful tool for analyzing and diagnosing elusive problems and increasing system performance. It is non-invasive and has no system overhead when not in use, but with its pervasive coverage, root cause for intermittent system problems can be found quickly; real-world applications have been optimized to run anywhere from 30% to 50 times faster.
    - **An Optimized TCP/IP Stack** where the TCP and IP layers are partially merged, delivers a 30- to 50-percent improvement in network throughput with a 10- to 15-percent lower CPU load than previous Solaris OS versions. There are also massive improvements in the UDP stack under Solaris 10 with performance gains of 30-120%.

- **Virtually Unparalleled Security** continues to be a focus as Solaris 10 adds significant features that can help defend against attacks by preventing unauthorized access to data and applications with:
    - **Process Rights Management** replaces the traditional UNIX “all or nothing” root mechanism with a fine-grained set of privileges for control over the resources and objects that processes can manipulate.
    - **Solaris Cryptographic Framework** secures data flows by providing a set of programming interfaces for application-level and kernel-level cryptographic operations, allowing developers to utilize highly optimized cryptographic algorithms and providing transparent access to the same hardware encryption acceleration devices used by the operating system kernel.
- **Relentless Availability – As customers have come to** expect in a Solaris environment, resiliency remains a top priority. Predictive self-healing technologies provide new levels of application availability with:

- **New predictive self-healing for Opteron based systems** extends Solaris fault manager functionality to integrate automatic monitoring of AMD64 CPU and system resources, and supports advanced features like real-time core & memory offlining
- **Solaris Fault Manager** proactively handles system problems by removing components before failure. CPU, memory and I/O problems are diagnosed and corrected – before they can cause downtime.
- **Solaris Service Manager tracks** dependencies among application software, OS facilities and system states ("milestones") , monitoring applications and restarting entire application trees if failures are detected.

Compatibility

- **Same OS—Low-End to High-End Systems.** The Solaris OS is built from a single source base and optimized to run on multiple platforms, providing customers with the same best of breed OS on SPARC and x86 systems, including optimized support for AMD Opteron 64-bit processors.
- **Solaris Application Guarantee Program.** This program guarantees binary compatibility between versions of Solaris on each platform and has been extended to include source code compatibility between SPARC and x86 systems .
- **Linux Compatibility.** With unwavering support for interoperability and open standards, and a commitment to delivering customer choice, Sun has made Linux interoperability a high priority.
    - **Standard Free/Open Source Software (F/OSS) libraries included in Solaris include:** Glib, Gtk+, JPEG, PNG, TIFF, and XML2
    - **Hundreds of F/OSS additional applications and libraries** are provided with the Solaris OS, including the GNOME desktop, Apache, Perl, and Postgres
    - **Solaris Containers for Linux Applications**, currently under development and available as part of the OpenSolaris initiative, allows Linux applications to run unchanged on the Solaris OS when coupled with a Linux distribution.
    - **Linux Compatibility Assurance Toolkit (LinCat)** helps to simplify the process of porting Linux applications to run natively on the Solaris OS.

Solaris Licensing

Solaris 10 is free to end-users and is available via no-cost download for registering at **http://www.sun.com/software/solaris/get.jsp**. Media kits are available for purchase.

Linux - Complementing Sun's Solaris OS Strategy

Key Messaging

Sun is key to Linux and Linux is key to Sun.

Contributions

- Sun is the largest contributor to the GNU/Linux operating system*. Key areas of support are OpenOffice.org, Mozilla, GNOME, X.org:
    - OpenOffice.org: Began life as StarOffice. Sun set it free in 2000 and now it is the standard Linux office suite.
    - Mozilla: Sun has been a major contributor providing both staff and funds helping to drive 508 accessibility and I18N (internationalization).
    - GNOME: Sun contributed most of the documentation and online help. Sun's contribution of the accessibility framework to GNOME allows desktop Linux to meet 508 compliance. A Sun employee serves as a GNOME board member.
    - X.Org: Sun has been a long term contributor. Hosted the X consortium on its campus this year. A Sun employee has been elected to their Board of Directors.

Benefits and Offerings

- GNU/Linux is essential to Sun's being able to provide its customers with the ability to chose the OS platform that best meets their needs.
- Supported GNU/Linux distributions
  - Sun resells subscriptions from the leading Linux providers, Red Hat & Novell:
    - Red Hat provides support for Red Hat Enterprise Linux.
    - Sun provides support for SuSE Linux Enterprise Server.
  - Sun works with Canonical Ltd. to certify and support selected x64 based systems and CoolThreads servers on **Ubuntu Linux.**
- Sun's CoolThreads servers have also been certified for Gentoo Linux.
- Sun's Carrier Grade Netra servers are certified for Monta Vista Linux.
- Sun Systems
  - Sun certifies its x64 based systems for Linux
  - Sun Storage line supports Linux
  - Sun SPARC systems support Linux
- Sun's key software offerings are available for GNU/Linux:
  - Lustre High Performance Computing File System
  - StarOffice/StarSuite Office Suite
  - Sun Ray Server Software
  - Sun Secure Global Desktop Software
  - Sun N1 Software
  - Java Desktop Powered Program
  - Dev. Tools: Sun Studio, Java Studio Creator, NetBeans IDE, N1 Grid Toolkit
- The Java Enterprise System and most of the Sun Java Suites are certified for Red Hat Enterprise Linux.
- All Java technology offerings for the server and desktop: J2SE, J2EE, Java Web Services Developer Pack, and the Jini Starter Pack.
  - The Java Development Kit (JDK), GlassFish application server, NetBeans tools and JavaDB database are included in the Ubuntu Linux distribution.
- Sun has recently announced its intention to acquire MySQL, the maker of the MySQL database, the "M" in the LAMP (Linux Apache MySQL Perl/Python/PHP) open source software stack.

*Source: Study on the: Economic impact of open source software on innovation and the competitiveness of the Information and Communication Technologies (ICT) sector in the EU, November 20, 2006, UNU-MERIT for the European Commission, p. 51

Red Hat Enterprise Linux

- Sun resells an unaltered distribution of Red Hat Enterprise Linux (RHEL) from Red Hat.
- When a customer purchases a Red Hat subscription from Sun, Red Hat provides support for the OS.
- If a new version of RHEL is introduced during the term of the support agreement, the customer is entitled to the newer version.
- For up-to-date roadmaps and other details, please see:
  - **onestop.eng/redhat**

SUSE Linux Enterprise Server

- Sun resells an unaltered distribution of SUSE Linux Enterprise Server (SLES) from Novell.

- When a customer purchases a SUSE subscription from Sun, Sun will be the single point of contact for customer support for the entire Linux solution including SLES. Sun will handle front line support and, if necessary, transparently to the customer will solicit help from Novell.

- If a new version of SLES is introduced during the term of the support agreement, the customer is entitled to the newer version.

- For up-to-date roadmaps and other details, please see:
  - **onestop.eng/suse**

Microsoft Windows

The Sun Fire X2100 M2 and Sun Fire X2200 M2 servers are certified to run Microsoft Windows Server 2003 Standard and Enterprise Editions (SP1 and later). Support is available from Sun Microsystems at an additional charge.

See Sun's service offerings at:

http://www.sun.com/service/serviceplans/windows/index.xml

Please bookmark and refer to the following Windows on Sun sites for frequently updated information:

External: **http://www.sun.com/software/windows/**

Internal: **https://onestop.central.sun.com/windows/**

Key Messaging

- **Designed For Windows**
  - Sun and Microsoft have developed a strong alliance. Sun supports Windows on its x64 systems, and resells Windows preinstalled on select systems (see above url's for details). Sun is also a Microsoft Gold Certified Partner.
  - Sun's x64 servers and workstations, as well as most of Sun's storage products, have passed Microsoft's stringent compatibility testing suite and are listed in the Windows Catalogs.
  - Sun systems have thus earned the "Designed for Windows"(TM) certification, demonstrating Sun's commitment to providing the best platforms to run not only Solaris and Linux, but Windows as well.

- **Flexibility for Sun's Heterogeneous Customers**
  - The ability to run Solaris, Microsoft Windows, or Linux software on Sun x64 servers and workstations allows customers to use a single vendor to meet a wide range of requirements.
  - Sun's support for multiple operating systems enables customers to deploy their choice of operating system without having to change hardware platforms when their requirements change. This helps reduce the cost and complexity required to support and manage multiple vendors, in turn helping to increase return on investment while reducing risk.

Other Windows on Sun Activities

- Please bookmark and refer to the external and internal URL's listed above in this section for frequent updates on other Windows on Sun activities, including:
  - Up-to-date Windows on Sun certification tables

- Microsoft Cluster certification listings
- Windows System and option card drivers posted on Sun's website
- Windows on Sun customer references
- World record Windows on Sun x64 system benchmarks
- Windows FAQ's and sales tools
- Documentation and tools for installing and running Windows on Sun

VMware

- Sun certifies its x64 based systems for VMware ESX.
- Sun (Client Solutions) resells ESX & related components from VMware.
- SunVIP Interop Support **(http://www.sun.com/service/sunvip/)** is available for VMware software sold through Sun.
- For up-to-date roadmaps and other details, please see:
  - **onestop.eng/vmware**

Installation Data

Sun Fire X2100 M2 and Sun Fire X2200 M2 Server Specifications

Processor, CPU Interconnect, Graphics Controller

	Sun Fire X2100 M2	**Sun Fire X2200 M2**
Processor	One AMD Opteron Processor **1000 Series**; Dual Core only No QC Support	One or two AMD Opteron Processor: Dual Core (Santa Rosa), 65nm Quad Core (Barcelona), and 45nm Quad Core (Shanghai)
Cache	1 MB Level 2 per core	**Dual Core (Santa Rosa)**: 1 MB Level 2 cache per core. No L3 **65nm Quad Core (Barcelona)**: 512KB Level 2 cache per core. 2MB L3 **45nm Quad Core (Shanghai):** 512KB Level 2 cache per core. 6MB L3
System Architecture/CPU Interconnect	X16 HyperTransport 8 GB/s (Processor to South Bridge)	X16 HyperTransport 8 GB/s (Processor to South Bridge) X16 HyperTransport 8 GB/s (CPU-0 to CPU-1)
Graphics Controller	ASPEED AST2000	ASPEED AST2000
Flash PROM	512 KB PROM	*Quad Core processors require motherboard PN:375-3560-01 (or later rev) which includes 1 MB PROM. This motherboard is included in all quad core ATO chassis and all Quad Core Std Configs. New dual core systems are planned to change to motherboard 375-3560-01 in Q4FY08.* ***Quad Core Upgrade Kits*** *are available to convert older dual core systems with older motherboards containing a 512 KB PROM to quad core performance. See* ***Ordering****.*

Main Memory

	Sun Fire X2100 M2	**Sun Fire X2200 M2**
DIMM Slots Memory type	4 DIMM slots 4 DIMM slots total system **Unregistered DDR2/667** ECC DIMMs (128 bit plus ECC databus)	8 DIMM slots per processor 16 DIMM slots total system **Registered DDR2/667** ECC DIMMs (128 bit plus ECC databus)

Supported DIMM Max. System Configuration	512 MB, 1 GB and 2 GB memory supported. System configurations from 512 MB up to 8 GB. For optimal performance, install DIMMS in pairs. Pairs of DIMMS must be matched.	2 GB and 4 GB memory supported. System configurations from 2 GB up to 64 GB. For optimal performance, install DIMMS in pairs. Pairs of DIMMS must be matched. **Sun Fire X2200 M2 server memory will down-clock to 533 MHz in the BIOS for a system configuration of more than four DIMM per processor.**

Standard/Integrated Interfaces (for both Sun Fire X2100 M2 and Sun Fire X2200 M2 servers)

Network	Four 10/100/1000 Base-T Ethernet ports Broadcom: ports 0,1 NVIDIA: ports 2, 3
Management	Network Management: One dualport 10/100/1000 Base-T Gigabit Ethernet port (one of four Network ports)
Serial	One Serial DB-9 Port (on rear)
SATA	Two channel SATA II interface, internal access only
SAS	Two channel SAS interface, internal access only. Requires optional SAS PCI card kit for Sun Fire X2100 M2; optional SAS PCI card kit and SAS cable kit for the Sun Fire X2200 M2 server.
USB	Six USB 2.0 ports - two front, four rear
Expansion bus	Riser card assembly with 2x internal 8-lane or 1x internal 16-lane low-profile, half length PCI-Express slot(s).
Power per PCI-Express slot	25W max per card

Mass Storage and Media (for both Sun Fire X2100 M2 and Sun Fire X2200 M2 servers)

Internal disk	Optional: Up to two 3.5” SATA II hard drives; 250GB, 500GB, 750GB or 1 TB 7,200 RPM drives supported, or Up to two 3.5” 146 GB or 300 GB, 15K RPM SAS hard drives. **SAS drives require optional SAS PCI card kit for Sun Fire X2100 M2 or optional SAS PCI card kit and SAS cable kit for Sun Fire X2200 M2.** Drive types can not be mixed in a system.
Internal DVD-ROM	Optional one EIDE tray-load DVD-ROM
External disk	See **http://www.sun.com/servers/entry/x2100/storage.jsp** **http://www.sun.com/servers/x64/x2200/storage.jsp**

Software

	Sun Fire X2100 M2	**Sun Fire X2200 M2**

Operating environment	**Latest OS Support Matrix: http://www.sun.com/servers/entry/x2100/os.jsp**	**Latest OS Support Matrix: http://www.sun.com/servers/x64/x2200/os.jsp**
Java Enterprise System 4	Solaris 10u2 on x64 Operating System Standard Linux distributions	Solaris 10u2 on x64 Operating System Standard Linux distributions
Languages	C/C++, FORTRAN, Java programming language, all other standard Sun-supported languages	C/C++, FORTRAN, Java programming language, all other standard Sun-supported languages
Networking Standards	ONC™, ONC+, NFS, WebNFS, TCP/IP, SunLink™, OSI, MHS, IPX™/SPX, SMB technologies, and XML	ONC™, ONC+, NFS, WebNFS, TCP/IP, SunLink™, OSI, MHS, IPX™/SPX, SMB technologies, and XML
Management	Standard on-board IPMI 2.0 compliant Service Processor offering KVMoIP	Standard on-board IPMI 2.0 compliant Service Processor offering KVMoIP

Power Supply

	Sun Fire X2100 M2		**Sun Fire X2200 M2**	
Quantity	Single PSU		Single PSU	
Power Supply Rating (DC Output)	345 W		450 W	
Power Supply AC Input	100-240 VAC (47-63 Hz) Auto-sensed		100-240 VAC (47-63 Hz) Auto-sensed	
	110 V 63 Hz Measured load	**220V 63 Hz Measured load**	**110 V 63 Hz Measured load**	**220V 63 Hz Measured load**
Max Config[1] Max Work Load[3]	234.15 Watts	225.47 Watts	453.8 Watts	415.2 Watts
Max Config[1] System Idle	143.55 Watts	138.77 Watts	351.5 Watts	335.9 Watts
Max Config[1] Standby System Power Requirements	24.14 Watts	23.7 Watts	12.2 Watts	11.7 Watts
Min Config[2] Max Work Load[3]	138.75 Watts	134.78 Watts	172.1 Watts	163.7 Watts
Min Config[2] System Idle	109.72 Watts	106.61 Watts	134.6 Watts	130.5 Watts
Min Config[2] Standby System Power Requirements	17.49 Watts	17.08 Watts	9.7 Watts	11.3 Watts
Power Calculator	**Http://www.sun.com/servers/entry/x2100/M2calc/index/jsp**		**Http://www.sun.com/servers/x64/x2200/calc/index.jsp**	

1 Maximum Configuration

CPU: 2x Next-Generation AMD 2218 processor (2.6GHz)
Memory: 16x Samsung 2GB
HDD: 2x Seagate 160GB 7200 rpm
ODD: 1x Panasonic DVD-ROM

I/O Adaptor: SAS Riser card, no cards

2 Minimum Configuration
PU: 1x Next-Generation AMD 2214 processor (2.2GHz)
Memory: 1x Infineon 1GB
HDD: 1x Seagate 160GB 7200 rpm
ODD: 1x Panasonic DVD-ROM

3 **Max Test Load**
OS: Windows 2003, 64-bit
AMD SST + Random

Environment

	Sun Fire X2100 M2	**Sun Fire X2200 M2**
AC power (Input)	100-240 VAC, 47-63 Hz	100-240 VAC, 47-63 Hz
UL Maximum (AC Input)	6.5A @ 100-240V	8A @100-127V, 4A @ 200-240V
Operating temperature /humidity (single, non-rack system)	2 ºC to 38 ºC (36 ºF to 100ºF), 7% to 93% relative humidity, non-condensing, 27 ºC max wet bulb	2 ºC to 38 ºC (36 ºF to 100 ºF), 7% to 93% relative humidity, non-condensing, 27 ºC max wet bulb
Non-operating temperature/humidity (single, non-rack system)	-40 ºC to 68 ºC (-40º F to 154 ºF), up to 93% relative humidity, non-condensing, 38 ºC max wet bulb	-40 ºC to 68 ºC (-40º F to 154 ºF), up to 93% relative humidity, non-condensing, 38 ºC max wet bulb
Altitude (operating) (single, non-rack system)	Up to 3,000m/9000ft, maximum ambient temperature is derated by 1º C per 300m above 900m	Up to 3,000m/9000ft, maximum ambient temperature is derated by 1º C per 300m above 900m
Altitude (non-operating) (single, non-rack system)	Up to 12,000 m	Up to 12,000 m

Acoustic Noise Emissions

Declared noise emissions in accordance with ISO 9296, A-weighted, operating and idling:

Measure & Environment	**Sun Fire X2100 M2**	**Sun Fire X2200 M2**
LwAd (1B = 10dB) Idle, at or below 25C Max, at ambient	 6.9 B 7.3 B	 6.9 B 7.2 B
LpAm bystander Idle, at or below 25C Max, at ambient	 56.7 dBA 61.0 dBA	 54.9 dBA 58.1 dBA

Regulations (applies to both Sun Fire X2100 M2 and Sun Fire X2200 M2 servers)

Meets or exceeds the following requirements:	
Safety	IEC 60950, UL/CSA60950, EN60950, CB scheme with all country differences
RFI/EMI	FCC Class A, Part 15 47 CFR, EN55022, CISPR 22, EN300-386:v1.31, ICES-003
Immunity	EN55024 ,EN300-386:v1.3.2

Certifications: Safety EMC	 CE Mark, GOST, GS Mark, cULus Mark, CB scheme, CCC, S Mark CE Mark, Emissions and Immunity Class A Emissions Levels: FCC, C-Tick, MIC, CCC, GOST, BSMI, ESTI, DOC, S Mark
Other	Labeled per WEEE (Waste Electrical and Electronic Equipment) Directive

Dimensions and Weight

	Sun Fire X2100 M2	**Sun Fire X2200 M2**
Height	43 mm (1.7”)	43 mm (1.7”)
Width	425.5mm (16.8”)	425.5mm (16.8”)
Depth	633.7 mm (25”)	633.7 mm (25”)
Maximum Weight	10.7 kg (23.5 lbs)	11.6 kg (24.6 lbs)
Minimum Weight	8.5 kg (18.7 lbs)	9.5 kg (20.8 lbs)

System Requirements, Configuration and Management

Operating System Requirements

The Sun Fire X2100 M2 and Sun Fire X2200 M2 servers run the Solaris 10 Operating System on x64 as well as standard Linux distributions and Microsoft Windows Server 2003 Standard Edition 2003. For a list of supported OS versions, please refer to section titled **Server Operating Systems Support.**

System Configuration

Sun Fire X2100 M2 Server

The Sun Fire X2100 M2 server has the following standard components:

- One AMD Opteron (socket AM2) 1000 Series dual core processor
- Four DIMM slots supporting **unbuffered** DDR2/667 MHz ECC DIMMs
- Up to two disk drive bays (optional) and up to one DVD-ROM (optional)
- Up to two 3.5” 7200 RPM SATA drives (250GB/500 GB/750GB/1 TB, or two 3.5” 146GB /300GB 15K RPM SAS drives (requires optional SAS PCI card kit for Sun Fire X2100 M2 server)
- Four 10/100/1000Base-T Ethernet ports
- Six USB 2.0 ports (2 front, 4 rear)
- Riser card assembly options: 2x 8-lane PCI-Express slots (low profile, half length) or 1x 16-lane PCI-Express slot.
- Single AC power supply
- Onboard Service Processor with embedded Lights Out Management
- On-board Graphics Controller
- 19-inch rack-mount kit (optional)
- Cable Management Arm (optional)

Sun Fire X2200 M2 Server

The Sun Fire X2200 M2 server has the following standard components:

- Up to two AMD Opteron (socket F (1207)) 2000 Series dual- or quad-core processors
- Eight DIMM slots per processor, supporting registered DDR2/667 MHz ECC DIMMs
- Up to two disk drive bays (optional) and up to one DVD-ROM (optional)
- Up to two 3.5” 7200 RPM SATA drives (250GB/500 GB/750GB/1 TB, or two 3.5” 146GB /300GB 15K RPM SAS drives (requires optional SAS PCI card kit and SAS cable kit for the Sun Fire X2200 M2 server.
- Four 10/100/1000Base-T Ethernet ports
- Six USB 2.0 ports (2 front, 4 rear)
- Onboard Service Processor with embedded Lights Out Management
- Riser card assembly options: 2x 8-lane PCI-Express slots (low profile, half length) or 1x 16-lane PCI-Express slot.
- Single AC power supply
- On-board embedded Lights Out Management Service Processor
- On-board Graphics Controller

- 19-inch rack-mount kit (optional)
- Cable Management Arm (optional)

MTBF Information

The MTBF (Mean Time Between Failure) for the Sun Fire X2100 M2 server varies depending upon configuration. Operating at 35 ºC, the MTBF is predicted by calculations to be up to 41,300 hours.

The MTBF (Mean Time Between Failure) for the Sun Fire X2200 M2 server varies depending upon configuration. Operating at 35 ºC, the MTBF for a Sun Fire X2200 M2 server configuration with all 16 DIMM slots populated is calculated to be 39,550 hours.

Measured BTU information

A **maximum configured** Sun Fire X2100 M2 server, with an AMD Opteron dual core 1218 CPU (2.6 GHz) processor, was measured **while running worst case stress** at 225 W = 768 BTUs per hour with 30.1 cu ft/min cooling provided by system fans.

A **maximum configured** Sun Fire X2200 M2 server, with an AMD Opteron dual core 2218 CPU (2.6 GHz) processor was measured **while running worst case stress at** 415 W = 1416 BTUs per hour with 37.8 cu ft/min cooling provided by system fans.

BTU Information and Power Calculator

The Sun Fire X2100 M2 and Sun Fire X2200 M2 power calculators can be used to determine the power consumption of a server for a given standard configuration or for a system specifically configured for a customer. Please see URLs in Installation Data table.

The intent of the power calculator is to provide guidance for estimating electrical and heat loads per server for racking and facilities planning. For the Sun Fire X2100 M2 and Sun Fire X2200 M2 servers, actual system power use was measured during a series of test runs of different configurations of the servers in order to provide estimates of individual component power requirements. The systems under test, in several different configurations, ran a composite workload intended to fully exercise the systems CPU(s) memory, local disk storage and Network and PCI-Express IO system.

The workload consisted of simultaneously executing:

- SPECfp2000_rate benchmark
- Creation of a 100GB file on a ZFS filesystem which extended over local disks and via a PCIe FC-AL card to a Fibre Channel array (a Dual Channel PCIe FC-AL card was linked to a FC-AL storage system)
- Installation of the Thunderbird package from the network using pkg-get
- GNOME GUI execution

From those tests, per per component power draw was extrapolated for the power calculator. While this load heavily stressed the systems, power draw under different loads may vary. Room temperatures during testing were below 25 degrees C.

The actual or precise power (in BTUs/hr or Watts) for the Sun Fire X2100 M2 or Sun Fire X2200 M2 server will vary depending upon hardware configuration, OS, application, and environmental conditions.

Rack Mounting

The Sun Fire X2100 M2 and Sun Fire X2200 M2 servers measure is 1.7 inches (43 mm) high, 16.8 inches (425.5 mm) wide and 25 inches (633.7 mm) deep. Most I/O ports are located on the rear panels; two USB ports are located on front panel. Informational LEDs are located on the front and back panels. Access to the power connection is at the rear of the chassis. For more information, please see the **Installation Guide** posted at: **http://docs.sun.com/app/docs/coll/x2200m2**

The air-flow direction is from front to back. Due to front to back cooling, rear fan doors are not required for racking of these servers.

Every current Sun rack is supported for in-field installation and for shipment preinstalled with servers by the Sun Customer Ready Systems (CRS) Program. For more information, see: **www.sun.com/CRS**

Field installation of these servers in the Sun Fire Expansion Cabinet, the Sun StorEdge Cabinet, Sun Rack 900 or 1000 cabinets, as well as 3rd party ANSI/EIA 310-D-1992 or IEC 60927 compliant cabinets is supported with the optional Slide Rail Kit (X8029A-Z) and optional Cable Management Arm (X8028A-Z).

Two optional slide rail kits - a Toolless kit and a 4-point hardware mounted kit – are designed to enable Sun Fire X2100 M2 and Sun Fire X2200 M2 servers to be racked in the Sun Rack 900, the Sun Rack 1038, the Sun Rack 1042 and 3rd party ANSI/EIA 310-D-1992 or IEC 60927 compliant racks. No other kits will be available to allow 2 point, front-mount, nor mid-mount configuration. The slide kits include all necessary hardware to enable mounting to any of the following types of rack rails:

- 6 mm threaded holes
- #10-32 threaded holes
- #10 clearance holes
- square unthreaded holes per EIA and IEC standards listed above

Rack requirements to support installation are:

- rack horizontal opening and unit vertical pitch conforming to ANSI/EIA 310-D-1992 and/or IEC 60927
- four-post structure (i.e. mounting at both front and rear)
- distance between front and rear mounting planes between 610mm and 915mm (24 to 36 inches)
- clearance depth (to front cabinet door) in front of front rack mounting plane at least 25.4mm (1 inch)
- clearance depth (to rear cabinet door) behind front rack mounting plane at least 800mm (31.5inches), or 700mm (27.5inches) without cable management arm
- clearance width (between structural supports, cable troughs, etc.) between front and rear mounting planes at least 456mm (18 inches)

Please note that not all 3rd party racks meet these parameters and are not compatible with these slide rail kits. Also, some third-party rack vendors do not support a completely filled rack with this type of server, due to the amount of power required.

For mounting in 2-post racks, see: **www.chatsworth.com** for trays and accessories. These products are not sold or supported by Sun.

Rack Density

Sun Fire X2100 M2 and Sun Fire X2200 M2 server rack density will vary widely based on each cabinet's:

- Weight limits
- Number of rack units
- Available power distribution (in-cabinet or external)
- Available power source (single-phase, three-phase)

Important Racking Notes:

- The front to rear cooling design, Sun Fire X2100 M2 and Sun Fire X2200 M2 servers do **NOT** require a fan door be installed on racks full of these servers.

- The Cable Management Arm can **NOT** be used with fiber cards/switches (e.g. Infiniband, Fiber HBAs) as fiber cables will be damaged when bent to install to CMA.

Tools and Drivers CD

Sun Fire X2100 M2 and Sun Fire X2200 M2 servers ship with a bootable Tools and Drivers CD containing tools and drivers including the following:

- System BIOS and BMC firmware
- Device drivers which are not included in most OS releases
- Broadcom NetXtreme Software
- Eurosoft PCCheck Diagnostic Software
- Flash utility programs
- Wipedisk utility
- Sun installation scripts
- Windows Reburn scripts

Origin statement

Sun Fire X2100 M2 and Sun Fire X2200 M2 servers have components from various countries of origin. The motherboard and chassis are manufactured in China. The PSU is manufactured in Thailand. The commodity parts such as disk drivers, memory, and CPU come from a variety of countries.

Final system assembly is performed in one of the following locations: Fremont, CA, U.S.A., Aachen, Germany or Shanghai, China.

Hardware Global compliance

Hardware Global compliance for this product complies with the guidelines as specified for hardware at:
http://global.eng/compliance/i18nl10nbigrules.html

The localized documents will be located at:
http://www.sun.com/products-n-solutions/hardware/docs/Servers/

Ordering Information (updated 11/06/08)

Sun Fire X2100 M2 Server Standard Configurations

Part Number	Description	Availability
A84-GQZ1-H-4GB-JL8	Sun Fire X2100 M2 x64 Server: AMD Opteron Model 1222 dual core processor (3.0GHz/1MB), 4x 1GB unregistered ECC DDR2-667 memory, no Serials ATA drives, no DVD, 1x PSU, Service Processor, 2x 10/100/1000 Ethernet ports, 6x USB 2.0 ports, 1x I/O riser card with 2x PCI-Express x8 slots, no power cords, order Geo-specific x-option. RoHS-5. Standard Configuration	EOL-announced 1/13/09 Last Order Date 4/13/09
A84-GPZ1-H-2GB-JL8	Sun Fire X2100 M2 x64 Server: AMD Opteron Model 1220 dual core processor (2.8GHz/1MB), 2x 1GB unregistered ECC DDR2-667 memory, no Serials ATA drives, no DVD, 1x PSU, Service Processor, 2x 10/100/1000 Ethernet ports, 6x USB 2.0 ports, 1x I/O riser card with 2x PCI-Express x8 slots, no power cords, order Geo-specific x-option. RoHS-5. Standard Configuration.	EOL-announced 1/13/09 Last Order Date 4/13/09
A84-GGZ1-H-4GB-JL8	Sun Fire X2100 M2 x64 Server: AMD Opteron Model 1218 dual core processor (2.6GHz/1MB), 4x 1GB unregistered ECC DDR2-667 memory, no Serials ATA drives, no DVD, 1x PSU, Service Processor, 2x 10/100/1000 Ethernet ports, 6x USB 2.0 ports, 1x I/O riser card with 2x PCI-Express x8 slots, no power cords, order Geo-specific x-option. RoHS-5. Standard Configuration.	EOL-announced 1/13/09 Last Order Date 4/13/09
A84-GWZ1-H-512-JL8	Sun Fire X2100 M2 x64 Server: AMD Opteron Model 1210 dual core processor (1.8GHz/1MB), 1x 512MB unregistered ECC DDR2-667 memory, no Serials ATA drives, no DVD, 1x PSU, Service Processor, 2x 10/100/1000 Ethernet ports, 6x USB 2.0 ports, 1x I/O riser card with 2x PCI-Express x8 slots, no power cords, order Geo-specific x-option. RoHS-5. Standard Configuration.	EOL-announced 1/13/09 Last Order Date 4/13/09

Sun Fire X2200 M2 Server Standard Configurations

Part Number	Description	Availability
45nm Opteron Quad Core ("Shanghai") Standard Configurations		
A85-ZSZ2-H-8GC-JL8	Two AMD Operon Model 2376 (Shanghai 2.3GHz), 4x2GB Registered DDR2-667, two x8 slots, no HDD, no ODD	Introduced 12/9/08
A85-ZWZ2-H-8GC-JL8	Two AMD Operon Model 2384 (Shanghai 2.7GHz), 4x2GB Registered DDR2-667, two x16 slots, no HDD, no ODD	Introduced 12/9/08
65nm Opteron Quad Core ("Barcelona") Standard Configurations		

Part Number	Description	Availability
A85-FSZ2-H-8GC-JL8	Two AMD Operon Model 2356 (Barcelona 2.3GHz), 4x2GB Registered DDR2-667, two x8 slots, no HDD, no ODD	EOL-announced 1/13/09 Last Order Date 4/13/09
A85-FSZ1-H-4GC-JL8	One AMD Operon Model 2356 (Barcelona 2.3GHz), 2x2GB Registered DDR2-667, two x8 slots, no HDD, no ODD	Introduced 12/9/08
A85-FFZ2-H-8GC-JL8	Two AMD Operon Model 2354 (Barcelona 2.2GHz), 4x2GB Registered DDR2-667, two x8 slots, no HDD, no ODD	EOL-announced 1/13/09 Last Order Date 4/13/09
A85-FFZ1-H-4GC-JL8	One AMD Operon Model 2354 (Barcelona 2.2GHz), 2x2GB Registered DDR2-667, two x8 slots, no HDD, no ODD	Introduced 12/9/08
A85-SUZ2-H-8GB-JL8	Two AMD Operon Model 2347HE (Barcelona 1.9GHz 50W), 4x2GB Registered DDR2-667, two x8 slots, no HDD, no ODD	EOL-announced 1/13/09 Last Order Date 3/9/09
Opteron Dual Core ("Santa Rosa") Standard Configurations		
High Performance Dual Core A85-FPZ2-H-4GB-GA1	Sun Fire X2200 M2 x64 Server: 2x AMD Opteron Model 2220 dual core processor (2.8GHz/1MB/95W), 4x 1GB registered ECC DDR2-667 memory, 1x 250GB SATA II drive, 1x DVD-ROM, 1x PSU, Service Processor, 4x 10/100/1000 Ethernet ports, 6x USB 2.0 ports, 1x I/O riser card with 2x PCI-Express x8 slots, no power cords, order Geo-specific x-option. RoHS-5. Standard Configuration.	EOL-announced 11/11/08 Last Order Date 2/11/09
Low Power Dual Core A85-SGZ2-H-4GB-GA1	Sun Fire X2200 M2 x64 Server: 2x AMD Opteron Model 2218 HE dual core processor (2.6GHz/1MB), 4x 1GB registered ECC DDR2-667 memory, 1x 250GB SATA II disk drive, 1x DVD-ROM, 1x PSU, Service Processor, 4x 10/100/1000 Ethernet ports, 6x USB, 2.0 ports, 1x I/O riser card with 2x PCI-Express x8 slots, no power cords, order Geo-specific x-option. RoHS-5. Standard Configuration.	EOL-announced 11/11/08 Last Order Date 2/11/09
Value-Performance Dual Core A85-JGZ2-H-8GC-JL8	Sun Fire X2200 M2 x64 Server: AMD Opteron Model 2218 dual core processor (2.6GHz/1MB), 4x 2GB registered ECC DDR2-667 memory, no Serials ATA drives, no DVD, 1x PSU, Service Processor, 2x 10/100/1000 Ethernet ports, 6x USB 2.0 ports, 1x I/O riser card with 2x PCI-Express x8 slots, no power cords, order Geo-specific x-option. RoHS-5. Standard Configuration.	Introduced on 9/2/08 EOL-announced 1/13/09 Last Order Date 3/9/09
A85-JWZ1-H-2GB-JL8	Sun Fire X2200 M2 x64 Server:AMD Opteron Model 2210 dual core processor (1.8GHz/1MB), 2x 1GB registered ECC DDR2-667 memory, no Serials ATA drives, no DVD, 1x PSU, Service Processor, 2x 10/100/1000 Ethernet ports, 6x USB 2.0 ports, 1x I/O riser card with 2x PCI-Express x8 slots, no power cords, order Geo-specific x-option.-5. Standard Configuration.	EOL-announced 11/11/08 Last Order Date 2/11/09

ATO CONFIGURATIONS

Sun Fire X2100 M2 Server XATO Chassis Option

Part Number	Description	Availability
A84-A-Z	Sun Fire X2100 M2 x64 Server XATO Base System: Chassis, Motherboard, 1x processor slot, 4x memory DIMM slots, 2x Serial ATA disk bays, 1x DVD bay, 1x AC PSU, Service Processor, 4x 10/100/1000 Ethernet ports, 6x USB 2.0 ports, no I/O riser card, no power cord, order Geo-specific x-option. RoHS-5. XATO only.	RR Sept 06 EOL-announced 1/13/09 Last Order Date 3/9/09

Sun Fire X2200 M2 Server XATO Chassis Option

Part Number	Description	Availability
A85-A-Z	Sun Fire X2200 M2 x64 Server XATO Base System: Chassis, Motherboard, 2x processor slots, 16x memory DIMM slots, 2x Serial ATA disk bays, 1x DVD bay, 1x AC PSU, Service Processor, 4x 10/100/1000 Ethernet ports, 6x USB 2.0 ports, 1x Riser Card with 2x PCI-Express x8 slot, no power cord, order Geo-specific X-option. RoHS-5. XATO only.	RR Sept 06 EOL-announced 1/13/09 Last Order Date 4/13/09
A85-A-QC	Sun Fire X2200 M2 x64 Server XATO **Quad Core Base System:** Chassis, Motherboard, 2x processor slots, 16x memory DIMM slots, 2x Serial ATA disk bays, 1x DVD bay, 1MB flash PROM, 1x AC PSU, Service Processor, 4x 10/100/1000 Ethernet ports, 6x USB 2.0 ports, 1x Riser Card with 2x PCI-Express x8 slot, no power cord, order Geo-specific X-option. RoHS-5. XATO only. **REQUIRED FOR QUAD CORE PROCESSORS**	RR April 2008

Sun Fire X2100M2 and X2200 M2 Server (X)ATO Options

The following part numbers are available as X- , XATO, and CRS options as noted for the Sun Fire X2100 M2 Server:

SUN FIRE X2100 M2 SERVER				
AMD Opteron 1000 Series for Sun Fire X2100 M2				
X-Option	**ATO**	**CRS**	**Description**	**Availability**
-	5331A-Z	-	Next-Generation AMD Opteron Model 1222 (3.0 GHz Dual Core 103W TDP)	EOL-announced 1/13/09 Last Order Date 4/13/09

SUN FIRE X2100 M2 SERVER				
-	5274A-Z	-	Next-Generation AMD Opteron Model 1220 (2.8 GHz Dual Core 103W TDP)	EOL-announced 1/13/09 Last Order Date 4/13/09
-	5270A-Z	-	Next-Generation AMD Opteron Model 1218 (2.6 GHz Dual Core 103W TDP)	EOL-announced 1/13/09 Last Order Date 4/13/09
-	5273A-Z	-	Next-Generation AMD Opteron Model 1210 (1.8 GHz Dual Core 103W TDP)	EOL-announced 1/13/09 Last Order Date 4/13/09
Unbuffered Memory for Sun Fire X2100 M2				
X-Option	**ATO**	**CRS**	**Description**	**Availability**
X5277A-Z	5277A-Z	5277A-Z	1 GB Unbuffered DDR2-667 DIMM Kit (2x 512MB)	Intro on Aug '07 EOL TBD Still usable on Ultra 24
X5278A-Z	5278A-Z	5278A-Z	2GB Unbuffered DDR2-667 DIMM Kit (2x 1GB)	Intro Aug '07 EOL TBD Still usable on Ultra 24
X5279A-Z	5279A-Z	5279A-Z	4GB Unbuffered DDR2-667 DIMM Kit (2x 2GB)	Intro Oct '07 EOL TBD Still usable on Ultra 24

Sun Fire X2200 M2 Options

AMD Quad Core Opteron 2000 Series for Sun Fire X2200 M2
REQUIRE ATO CHASSIS A85-A-QC

X-Option	ATO	CRS	Description	Availability
See Upgrade kits	5329A	5329A	Quad Core AMD Opteron Model 2356 (2.3 GHz, 75W ACP)	RR April 2008 EOL TBD
See Upgrade kits	5328A	5328A	Quad Core AMD Opteron Model 2354 (2.2 GHz, 75W ACP)	RR April 2008 EOL TBD
See Upgrade kits	5330A	5330A	Quad Core AMD Opteron Model 2347 HE (1.9 GHz, 55W ACP)	EOL-announced 1/13/09 Last Order Date 4/13/09
See Upgrade kits	5332A	5332A	Quad Core AMD Opteron Model 2346 HE (1.9 GHz, 55W ACP	EOL-announced 1/13/09 Last Order Date 4/13/09

SUN FIRE X2100 M2 SERVER

AMD Dual Core Opteron 2000 Series for Sun Fire X2200 M2

X-Option	ATO	CRS	Description	Availability
(X)4065A-Z	4065A-Z	4065A-Z	Dual Core AMD Opteron Model 2222 (3.0 GHz Dual Core 95 W TDP)	EOL-announced 1/13/09 Last Order Date 4/13/09
(X)5284A-Z	5284A-Z	5284A-Z	Dual Core AMD Opteron Model 2220 (2.8 GHz Dual Core 95 W TDP)	EOL-announced 1/13/09 Last Order Date 4/13/09
(X)4064A-Z	4064A-Z	4064A-Z	Dual Core AMD Opteron Model 2218 HE (2.6 GHz Dual Core 68 W TDP)	EOL-announced 1/13/09 Last Order Date 4/13/09
X5280A-Z	5280A-Z	5280A-Z	Dual Core AMD Opteron Model 2218 (2.6 GHz Dual Core 95 W TDP)	EOL-announced 1/13/09 Last Order Date 4/13/09
X5283A-Z	5283A-Z	5283A-Z	Dual Core Opteron Model 2210 (1.8 GHz Dual Core 95 W TDP)	EOL-announced 1/13/09 Last Order Date 4/13/09

Memory for Sun Fire X2200 M2

X-Option	ATO	CRS	Description	Availability
X5287A-Z	5287A-Z	5287A-Z	2 GB Registered DDR2-667 DIMM Kit (2x 1 GB)	Intro in Aug '06 EOL-announced on 11/11/08 Last Order Date 2/11/09
X5288A-Z	5288A-Z	5288A-Z	Dual-Ranked 4 GB Registered DDR2-667 DIMM Kit (2x 2 GB)	Intro in Aug '06 EOL-announced on 9/2/08 Last Order Date 12/2/08
X5288A-C	5288A-C	5288A-C	Single-Ranked 4 GB Registered DDR2-667 DIMM Kit (2x 2 GB)	Intro in Sep '08 EOL TBD
X4063A-Z	4063A-Z	4063A-Z	8 GB Registered DDR2-667 DIMM Kit (2x 4GB)	Intro in Jan '07 EOL TBD
X4087A-Z	4087A-Z	4087A-Z	New 8 GB Registered DDR2-667 DIMM Kit (2x 4GB)	Intro in Dec' 08

Sun Fire X2100 M2 and Sun Fire X2200 M2 Options

DVD

X-Option	ATO	CRS	Description	Availability

SUN FIRE X2100 M2 SERVER				
X5294A-Z	5294A-Z	5294A-Z	DVD-ROM	Aug '07
x5286A-Z	5286A-Z	5286A-Z	DVD+/-RW dual layer drive	Q3FY07
-	5291A-Z	5291A-Z	Filler Panel for DVD bay	Aug '06
Disk Drives				
X-Option	**ATO**	**CRS**	**Description**	**Availability**
XRB-ST1CE-1T7K	N/A	RB-ST1CE-1T7K	3.5” 1TB 7,200 RPM SATA drive	To be added March '08
XRB-ST1CE-750G7K	N/A	RB-ST1CE-750G7K	3.5” 750GB 7,200 RPM SATA drive	Q3FY07
XRB-ST1CE-500G7KZ	RB-ST1CE-500G7KZ	RB-ST1CE-500G7KZ	3.5” 500GB 7,200 RPM SATA drive	Aug '06
XRC-ST1CE250G7K	RC-ST1CE250G7K	RC-ST1CE250G7K	3.5” 250GB 7,200 RPM SATA drive	Q2FY07
XRB-SS1CE-146G15KZ	RB-SS1CE-146G15KZ	RB-SS1CE-146G15KZ	3.5” 146GB 15,000 RPM SAS drive – **REQUIRES 4-PORT SAS HBA FOR X2100 M2; 4-PORT SAS AND CABLE KIT FOR X2200 M2**	Q3FY07
XRB-SS1CE-300G15KZ	N/A	RB-SS1CE-300G15KZ	3.5” 300GB 15,000 RPM SAS drive - **REQUIRES 4-PORT SAS HBA FOR X2100 M2; 4-PORT SAS AND CABLE KIT FOR X2200 M2**	Q4FY07
-	8088A-Z	8088A-Z	Hard Drive Filler Panel	Aug '06
I/O Riser Cards				
X-Option	**ATO**	**CRS**	**Description**	**Availability**
X5293A-Z	5293A-Z	5293A-Z	I/O Riser card with 2x 8-lane PCI-Express slots	EOL-announced 1/13/09 Last Order Date 4/13/09
X5292A-Z	5292A-Z	5292A-Z	I/O Riser card with 1x 16-lane PCI-Express slots **ONLY SUPPORTS NVIDIA QUADRO PLEX HBA**	EOL-announced 1/13/09 Last Order Date 4/13/09
Rack Mount Options				
X-Option	**ATO**	**CRS**	**Description**	**Availability**
X8029A-Z	8029A-Z	8029A-Z	Rack Mounting Slide Rail Kit (same as Aquarius/Galaxy 1, 2)	Aug '06
X8029A-EZ	8029A-EZ	8029A-EZ	EZ Mount Rack Mount Kit (also supported for X2200 M2, Galaxy 1, 2)	July '07

SUN FIRE X2100 M2 SERVER				
X8028A-Z	8028A-Z	8028A-Z	Cable Management Arm (same as Aquarius/Galaxy 1, 2)	Aug '06
Solaris Preinstall				
X-Option	**ATO**	**CRS**	**Description**	**Availability**
N/A	N/A	N/A	Solaris 10u2 and JESv4 pre-install on 1TB SATA drive	This drive not available through ATO
N/A	N/A	N/A	Solaris 10u2 and JESv4 pre-install on 750GB SATA drive	This drive not available through ATO
N/A	5298A	Use S10u2-IP part #	Solaris 10 and JES pre-install on 500 B SATA drive	RR SEPT 07
N/A	5297A	Use S10u2-IP part #	Solaris 10 and JES pre-install on 250GB SATA drive	RR SEPT 07
N/A	5299A	Use S10u2-IP part #	Solaris 10 and JES pre-install on 146GB SAS drive	Q3FY07
N/A	N/A	Use S10u2-IP part #	Solaris 10 and JES pre-install on 300GB SAS drive	This drive not available through ATO
I/O Cards				
X-Option	**ATO**	**CRS**	**Description**	**Availability**
SG-XPCIE2FC-QF4	SG-PCIE2FC-QF4	SG-PCIE2FC-QF4	Sun StorEdge 4 GB Dual Port Fibre Channel PCI-Express Card (Qlogic). RoHS-6.	Supported Nov '06
SG-XPCIE1FC-QF4	SG-PCIE1FC-QF4	SG-PCIE1FC-QF4	Sun StorEdge 4 GB Single Port Fibre Channel PCI-Express Card (Qlogic). RoHS-6.	Supported Nov '06
SG-XPCIE2FC-EM4	SG-PCIE2FC-EM4	SG-PCIE2FC-EM4	Sun StorEdge 4 GB Dual Port Fibre Channel PCI-Express Card (Emulex). RoHS-6.	Supported Nov '06
SG-XPCIE1FC-EM4	SG-PCIE1FC-EM4	SG-PCIE1FC-EM4	Sun StorEdge 4 GB Single Port Fibre Channel PCI-Express Card (Emulex). RoHS-6.	Supported Aug '06
X7280A-2	7280A-2	7280A-2	Sun PCI-E Low profile Dual GigE (Copper) UTP, low profile bracket on board. Standard bracket included in X-option. ROHS-6.	Supported Aug '06
SG-XPCIE2SCSIU320Z	SG-PCIE2SCSIU320Z	SG-PCIE2SCSIU320Z	Sun PCI-E Ultra320 SCSI 2-port HBA. RoHS-6	Supported Aug '06
X7281A-2	7281A-2	7281A-2	Sun PCI-E Low-Profile Dual GigE (Fiber) MMF, low profile bracket on board. Standard bracket included in X-option. RoHS-6.	Supported Sept '06
X1106A-Z	n/a	X1106A-Z	Single port Sun 10 Gigabit Ethernet Networking Card with fixed transceiver (Intel)	Supported April 2008
X1107A-Z	n/a	X1107A-Z	Dual port Sun 10 Gigabit Ethernet Networking Card with fixed transceiver (Intel)	Supported April 2008

SUN FIRE X2100 M2 SERVER				
X1236A-Z	1236A-Z	1236A-Z	Infiniband PCI-Express Card. RoHS-6.	Supported Sept '06
SG-XPCIE4SAS3-Z	**SG-PCIE4SAS3-Z**	**SG-PCIE4SAS3-Z**	LSI Logic SAS3041E-R, PCI Express, 4-port 3Gb/s Serial Attached SCSI (SAS) HBA	**NEW PART NUMBER DEC '07 (see above)**

Sun Fire X2200 M2 Server Quad Core Upgrade Kits

Part Number	Description	Availability
X5329A-QC-UP2	65nm Quad Core 2 CPU Upgrade Kit: 2x Quad Core AMD Opteron Model 2356 (Barcelona 2.3 GHz, 75W ACP), 2x pregreased heat sinks, 1 MB flash PROM with Quad Core BIOS preflashed, chip puller tool, pointer to web based installation instructions	RR April 2008 EOL TBD
X5328A-QC-UP2	65nm Quad Core 2 CPU Upgrade Kit: 2x Quad Core AMD Opteron Model 2354 (Barcelona 2.2 GHz, 75W ACP), 2x pregreased heat sinks, 1 MB flash PROM with Quad Core BIOS preflashed, chip puller tool, pointer to web based installation instructions	RR April 2008 EOL TBD
X5330A-QC-UP2	65nm Quad Core 2 CPU Upgrade Kit: 2x Quad Core AMD Opteron Model 2347 HE (Barcelona 1.9 GHz, 55W ACP), 2x pregreased heat sinks, 1 MB flash PROM with Quad Core BIOS preflashed, chip puller tool, pointer to web based installation instructions	EOL-announced 1/13/09 Last Order Date 4/13/09
X5332A-QC-UP2	65nm Quad Core 2 CPU Upgrade Kit: 2x Quad Core AMD Opteron Model 2346 HE (Barcelona 1.8 GHz, 55W ACP), 2x pregreased heat sinks, 1 MB flash PROM with Quad Core BIOS preflashed, chip puller tool, pointer to web based installation instructions	EOL-announced 1/13/09 Last Order Date 4/13/09
X5335A-QC-UP2	45nm Quad Core 2 CPU Upgrade Kit: 2x Quad Core AMD Opteron Model 2384 (Shanghai 2.7 GHz, 75W ACP), 2x pregreased heat sinks, 1 MB flash PROM with Quad Core BIOS preflashed, chip puller tool, pointer to web based installation instructions	Intro in Dec '08
X5334A-QC-UP2	45nm Quad Core 2 CPU Upgrade Kit: 2x Quad Core AMD Opteron Model 2376 (Shanghai 2.3 GHz, 75W ACP), 2x pregreased heat sinks, 1 MB flash PROM with Quad Core BIOS preflashed, chip puller tool, pointer to web based installation instructions	Intro in Dec '08

Upgrade Kit Recycling Discount

Customers willing to return to Sun all the parts removed (processors, heat sinks, PROM) from each server during the upgrade process for proper recycling can receive a **20% discount off List Price of the Upgrade Kit.** Apply **Allowance Code ALW-20-S-2XMOD** to an Upgrade Kit order. The customer is then sent a prepaid carton to return materials to Sun. Returns must be completed within 90-days of purchase or customer will be invoiced the amount of the 20% discount.

Learn more at: **http://www.sun.com/tradeins/index.jsp**

Power Cords

Due to regulatory requirements of other countries, the Sun Fire X2100 M2 and Sun Fire X2200 M2 Server Standard Configurations and XATO Chassis options are shippable anywhere in the world, but required to bundle their power cord separately.

Each Geography must select their specific Country Power cord kit as listed in table to be included with each system or chassis.

Part Number	Description
X311L	US/Brazil/Asia (except China) Localized power cord kit ROHS
X312E	China Localized power cord kit ROHS
X312F	Argentina Localized power cord kit ROHS
X312G	Korea Localized power cord kit ROHS
X312L	Continental Europe Localized power cord kit ROHS
X314L	Switzerland Localized power cord kit ROHS
X317L	U.K. Localized power cord kit ROHS
X332A	Taiwan Localized power cord kit ROHS
X383L	Danish Localized power cord kit ROHS
X384L	Italian Localized power cord kit ROHS
X386L	Australian Localized power cord kit ROHS

General Configuration Notes:

1. Can not mix dual and quad core processors in a system.
2. For optimum performance memory must be installed in pairs in order for the processor to to run in 128-bit ECC mode. DIMMs installed as a pair need to be the same density however pairs of different densities may be mixed, e.g. 2X512 MB and 2x1 GB. One- or three-DIMM configurations are supported, but the processor with run in 64-bit ECC mode reducing performance.
3. A combination different capacity but same type drive (e.g. 1x 250 GB SATA and 1x 500 GB SATA) is supported; a combination of SATA and SAS drives is not supported. If onboard RAID 1 mirroring is going to be used, it requires identical type and capacity drives.
4. For the latest information on PCI-Express card support, please see:
   http://www.sun.com/servers/entry/X2100/optioncards.jsp
   http://www.sun.com/servers/x64/x2200/optioncards.jsp

XATO Configuration Notes:

1. Quad-Core processors required QC ATO Chassis (A85-A-QC)
2. Can not mix dual and quad core processors in a system.
3. XATO allows the configuration of systems to exact customer requirements. This provides the customer with a fully tested and configured system that requires little, if any, additional configuration prior to deployment. All XATO orders require a working configuration. An XATO configuration can not be created without a processor, memory and I/O riser card assembly.
4. A minimum of one CPU option required. Sun Fire X2200 M2 server can be built as a one or two processor server.
5. A minimum of one memory option is required.
6. An I/O riser card assembly is required.
7. For a diskless configuration, two disk bay filler panels and one DVD bay filler panel are required.

Services

Warranty Support

The Sun Fire X2100 M2 and Sun Fire X2200 M2 Servers have a one year, next business day warranty.

Duration:	1 year Next Business Day
HW Coverage Hours:	Business Hours
HW Response Times:	Next Business Day
Delivery Method:	Parts Exchange or Onsite
HW Phone Coverage:	Business Hours
HW Phone Response Time:	8 hours

Sun Service Plans

Sun Global Customer Services offers a full range of services to assist customers who deploy the Sun Fire X2100 M2 and Sun Fire X2200 M2 server. Whether it is architecture services, implementation services, or services to help customers manage the servers once released to production, Sun has the right services during nearly every phase of the project's life cycle.

Sun provides a service plan to meet every customers needs: the SunSpectrum℠ Service Plan for full system support ranging from basic to mission critical service levels, Sun℠ System Service Plans for Windows OS offering the same four levels where Microsoft Windows is the operating system, the Sun Hardware Only Service Plan, and Sun Software Service Plan. All four Service Plans are available for the Sun Fire X2100 M2 and Sun Fire X2200 M2 servers.

- SunSpectrum™ Service Plans: Get integrated hardware and Solaris support via the support program acclaimed by industry analysts*
- Sun℠ System Service Plans for Windows OS: Get integrated hardware and Windows OS support
- Hardware Service Plans: Provide an affordable, convenient way to maintain your Sun systems. With easy access to Sun technical support and quick system repair or replacement.
- Sun Software Service Plans: For fundamental software services such as technical phone or web-based support and software maintenance (updates and upgrades), Sun offers two levels of service for your production system software.

* Prognostics report 2004, Forrester report 2005

Why the Warranty Isn't Enough

While computer system warranties provide business customers with some assurance of product quality, they do not provide many essential system services or operating system support. In addition, warranties provide default repair times and coverage hours which may not suit customer needs. It's just that a warranty and a Service Plan are two very different things with two very different objectives. Break/fix is no way to live - make sure your customers have Service Plan coverage on all their active Sun systems. For more information go to: **www.sun.com/comparewarranty**

SunSpectrum Service Plans

SunSpectrum Service Plans provide integrated hardware and Solaris operating system support for Sun systems as well as comprehensive storage system support. For each Sun system, customers can choose the service plan that best fits their needs. Customers benefit from lower SunSpectrum Instant Upgrade (SIU) pricing when purchasing support at time of system sale.

More information at: **www.sun.com/service/support/sunspectrum**

SunSpectrum Service Plan Highlights:

- Integrated whole-system support
- All the essentials for one great price
- Priority service
- No "per incident" limits
- Includes Solaris™ releases and updates
- Resources for proactive system management
- A choice of four simple plans

Sun System Service Plan for the Solaris OS

	Platinum	Gold	Silver	Bronze
Hardware Service Coverage	24/7 On-site within two hours	8-8, M-F On-site within four hours	8-5, M-F On-site within four hours	Replacement parts within two business days
Telephone and Online Technical Support	24/7 Live transfer	24/7 Live transfer	8-8, M-F Live transfer	8-5, M-F 4 hour response
SunVIP Interop Support	Yes	Yes	No	No
Knowledgebase Access	Yes	Yes	Yes	Yes
Solaris Releases	Yes	Yes	Yes	Yes
On-Demand Solaris Updates	Yes	Yes	Yes	Yes
Sun Alerts and Notifications	Yes	Yes	Yes	Yes
SunSpectrum eLearning Library	Yes	Yes	Yes	Yes
System Health Check Subscription	Yes	No	No	No
Additional Services for Qualifying Sites	Customer sites meeting qualification criteria may receive additional services including credits toward educational services			

Availability of specific features, coverage hours, and response times may vary by location, product, or service level. Other limitations may apply.

Response times are determined by customer-defined priority. The response times shown are for service requests designated by the customer as "Priority 1."

To receive the best support, Sun recommends that customers install Sun Net Connect software on SPARC-based systems. This software creates a secure, customer-controlled link to the Sun Solution Center which helps enable expedited Solaris OS troubleshooting, remote diagnostics, and a number of customer-enabled alerting and reporting functions.

Sun Hardware Only Service Plan

If the customers is purchasing a Sun Fire X2100 M2 or Sun Fire X2200 M2 server from Sun and will use Red Hat Linux or SUSE Linux, the SunSpectrum Service Plan outlined above is not the best choice for extended support. In its place, Sun offers multiple on-site Hardware Only Support Plans, as well as support and updates for 3rd party operating system through Sun Software Service Plans (see Software Support section). Sun Hardware Only Service Plans should be offered in the following situations:

- If the customer solution includes Linux/Windows as the OS

• If the customer requires support for ONLY their hardware

With the Sun Hardware Only Service Plans, Sun Fire X2100 M2 and Sun Fire X2200 M2 server customers benefit from the choice of service to best match their business needs corresponding to coverage hours and response times for technical support. With a focus on Sun's entry-level server products, these features offer unbundled hardware support for these servers at a competitive price.

Support Upgrades for Sun Fire X2100 M2 and Sun Fire X2200 M2 Servers

The following are part numbers and descriptions for the warranty upgrades for the Sun Fire X2100 M2 and X2200 M2 servers:

Part Number	*Description*
IWU-A84-1S	Upgrade to 1 year SunSpectrum Silver for Sun Fire X2100 M2 Server
IWU-A84-2S	Upgrade to 2 year SunSpectrum Silver for Sun Fire X2100 M2 Server
IWU-A84-3S	Upgrade to 3 year SunSpectrum Silver for Sun Fire X2100 M2 Server
IWU-A84-1G	Upgrade to 1 year SunSpectrum Gold for Sun Fire X2100 M2 Server
IWU-A84-2G	Upgrade to 2 year SunSpectrum Gold for Sun Fire X2100 M2 Server
IWU-A84-3G	Upgrade to 3 year SunSpectrum Gold for Sun Fire X2100 M2 Server
IWU-A84-22-1H	Upgrade to 1 year 7x 24 Hardware Only support with 2 hour response time for Sun Fire X2100 M2 Server.
IWU-A84-22-2H	Upgrade to 2 year 7x 24 Hardware Only support with 2 hour response time for Sun Fire X2100 M2 Server.
IWU-A84-22-3H	Upgrade to 3 year 7x 24 Hardware Only support with 2 hour response time for Sun Fire X2100 M2 Server.
IWU-A84-24-1H	Upgrade to 1 year 7x 24 Hardware Only support with 4 hour response time for Sun Fire X2100 M2 Server.
IWU-A84-24-2H	Upgrade to 2 year 7x 24 Hardware Only support with 4 hour response time for Sun Fire X2100 M2 Server.
IWU-A84-24-3H	Upgrade to 3 year 7x 24 Hardware Only support with 4 hour response time for Sun Fire X2100 M2 Server.
IWU-A84-SD-1H	Upgrade to 1 year of Hardware Only Same Day Support for Sun Fire X2100 M2 Server.
IWU-A84-SD-2H	Upgrade to 2 year of Hardware Only Same Day Support for Sun Fire X2100 M2 Server.
IWU-A84-SD-3H	Upgrade to 3 year of Hardware Only Same Day Support for Sun Fire X2100 M2 Server.
IWU-A84-24-1G	Upgrade to 1 year SunSpectrum Gold 7X24 for Sun Fire X2100 M2 Server
IWU-A84-24-2G	Upgrade to 2 year SunSpectrum Gold 7X24 for Sun Fire X2100 M2 Server

Part Number	Description
IWU-A84-24-3G	Upgrade to 3 year SunSpectrum Gold 7X24 for Sun Fire X2100 M2 Server
IWU-A84-1P	Upgrade to 1 year SunSpectrum Platinum for Sun Fire X2100 M2 Server
IWU-A84-2P	Upgrade to 2 year SunSpectrum Platinum for Sun Fire X2100 M2 Server
IWU-A84-3P	Upgrade to 3 year SunSpectrum Platinum for Sun Fire X2100 M2 Server

Sun Fire X2200 M2 Server

Part Number	Description
IWU-A85-1S	Upgrade to 1 year SunSpectrum Silver for Sun Fire X2200 M2 Server
IWU-A85-2S	Upgrade to 2 year SunSpectrum Silver for Sun Fire X2200 M2 Server
IWU-A85-3S	Upgrade to 3 year SunSpectrum Silver for Sun Fire X2200 M2 Server
IWU-A85-1G	Upgrade to 1 year SunSpectrum Gold for Sun Fire X2200 M2 Server
IWU-A85-2G	Upgrade to 2 year SunSpectrum Gold for Sun Fire X2200 M2 Server
IWU-A85-3G	Upgrade to 3 year SunSpectrum Gold for Sun Fire X2200 M2 Server
IWU-A85-22-1H	Upgrade to 1 year Hardware only 7X24 support with 2 hour response time for Sun Fire X2200 M2 Server
IWU-A85-22-2H	Upgrade to 2 year Hardware only 7X24 support with 2 hour response time for Sun Fire X2200 M2 Server
IWU-A85-22-3H	Upgrade to 3 year Hardware only 7X24 support with 2 hour response time for Sun Fire X2200 M2 Server
IWU-A85-24-1G	Upgrade to 1 year 7X24 Gold support for Sun Fire X2200 M2 Server
IWU-A85-24-2G	Upgrade to 2 year 7X24 Gold support for Sun Fire X2200 M2 Server
IWU-A85-24-3G	Upgrade to 3 year 7X24 Gold support for Sun Fire X2200 M2 Server
IWU-A85-24-1H	Upgrade to 1 year 24x7 Hardware Only with 4 hour response support for Sun Fire X2200 M2 Server
IWU-A85-24-2H	Upgrade to 2 year 24x7 Hardware Only with 4 hour response support for Sun Fire X2200 M2 Server
IWU-A85-24-3H	Upgrade to 3 year 24x7 Hardware Only with 4 hour response support for Sun Fire X2200 M2 Server
IWU-A85-1P	Upgrade to 1 year SunSpectrum Platinum for Sun Fire X2200 M2 Server
IWU-A85-2P	Upgrade to 2 year SunSpectrum Platinum for Sun Fire X2200 M2 Server
IWU-A85-3P	Upgrade to 3 year SunSpectrum Platinum for Sun Fire X2200 M2 Server

Part Number	Description
IWU-A85-SD-1H	Upgrade to 1 year Same Day Hardware Only support for Sun Fire X2200 M2 Server.
IWU-A85-SD-2H	Upgrade to 2 year Same Day Hardware Only support for Sun Fire X2200 M2 Server.
IWU-A85-SD-3H	Upgrade to 3 year Same Day Hardware Only support for Sun Fire X2200 M2 Server.

Sun™ System Service Plans for Linux OS

Red Hat Enterprise Linux products from Sun are delivered on a subscription basis with bundled software support directly from Red Hat and access to Red Hat Enterprise Network Service to help your enterprise IT deployments stay reliable and secure.

For more information, visit:
http://www.sun.com/service/serviceplans/linux/redhat.html

http://www.sun.com/service/serviceplans/linux/suse.html

Sunsm System Service Plans for Windows OS

The Sunsm System Service Plans for Windows OS are designed to be flexible enough to cover most customers requirements for support. Highlights include:

- Integrated whole-system support for Sun's X64 systems running Microsoft Windows
- All the essentials for one great price
- Priority service
- No "per incident" limits

Features	Premium Service Plan (Mission Critical Systems)	Standard Service Plan (Same Day Support)	Basic Service Plan (Non-Critical Support)
Telephone and Online Technical Support	24/7 Live transfer	8-8, M-F Live transfer	8-5, M-F 4hr response
Hardware Service Coverage	24/7 2hr onsite	8-5, M-F 4hr onsite	Replacement Parts, 2nd Business Day
Online System Admin Resources	Yes	Yes	Yes
Support Notification Services	Yes	Yes	Yes
* Availability of specific features, coverage hours and response times may vary by location and./or product. * Response times are determined by customer defined priority. The response times show are for service requests designated by the customer as “Priority 1”.			

For more information, visit: **http://www.sun.com/service/serviceplans/windows/**

Glossary

1U or RU	One rack unit as defined by the Electronic Industries Alliances (EIA). A vertical measurement equal to 1.75 inches.
ATA	AT-Attachment. A type of hardware interface widely used to connect hard disks, CD-ROMs and tape drives to a PC.
ECC	Error Correcting Code. A type of memory that corrects errors on the fly.
Ethernet 10/100/1000Base-T	The most widely used LAN access method defined by the IEEE 802.3 standard; uses standard RJ-45 connectors and telephone wire. 100Base-T is also referred to as Fast Ethernet. And 1000Base-T is also referred to as Gigabit Ethernet.
FRU	Field Replaceable Unit.
Hot-pluggable	A feature that allows an administrator to remove a drive without affecting hardware system integrity.
Hot-swappable	A feature that allows an administrator to remove and/or replace a device without affecting software integrity. This means that, while the system does not need to be rebooted, the new component is not automatically recognized by the system.
IDE	See ATA.
IKE	Internet Key Exchange. A method for establishing a security association that authenticates users, negotiates the encryption method and exchanges the secret key. IKE is used in the IPSec protocol.
I/O	Input/output. Transferring data between the CPU and any peripherals.
IPSec	IP Security. A security protocol from the IETF (Internet Engineering Task Force) that provides authentication and encryption over the Internet. Unlike SSL, which provides services at layer 4 and secures two applications, IPSec works at layer 3 and secures everything in the network.
IPMI	Intelligent Platform Management Interface. System management architecture for providing an industry-standard interface and methodology for system management.
L2 cache	Also referred to as Ecache or External Cache. A memory cache external to the CPU chip. The AMD Opteron processor integrates 1 MB of L2 cache per CPU.
MTBF	Mean Time Between Failures. The average time a component works without failure.
RAM	Random Access Memory.
SAS	Serial Attached SCSI. A serial hardware interface that allows the connection of up to 128 devices and point-to-point data transfer speeds up to 3 Gbits/sec.
SATA	Serial Attached ATA. The resulting evolution of the ATA (IDE) interface from a parallel to a serial and from a master-slave to a point-to-point architecture with data transfer speeds up to 1.5 Gb/sec.
SCSI	Small Computer Systems Interface. Pronounced “scuzzy.” An ANSI standard hardware interface that allows the connection of up to 15 peripheral devices to a single bus.
SNMP	Simple Network Management Protocol. A set of protocols for managing complex networks. The first versions of SNMP were developed in the early 80s. SNMP works by sending messages, called protocol data units (PDUs), to different parts of a network. SNMP-compliant devices, called agents, store data about themselves in Management Information Bases (MIBs) and return this data to the SNMP requesters.
X86	Refers to the Intel 8086 family of microprocessor chips as well as compatible microprocessor chips made by AMD and others.

Materials Abstract

All materials will be available on SunWIN except where noted otherwise.

Collateral	Audience	Purpose	SunWIN Token #
Product Literature			
• *Sun Fire X2100 M2 Server Datasheet*	Customer	Sales Tool, Training	449506
• *Sun Fire X2200 M2 Server Datasheet*	Customer	Sales Tool, Training	478547
• Sun Fire X2100 M2/Sun Fire X2200 M2 Server *Technical Architecture White Paper*	Customer	Sales Tool, Training	478552
• *Sun Fire X2100 M2/Sun Fire X2200 M2 Server Reviewer's Guide*		Sales Tool, Training	478553
Sales Tools			
• *Sun Fire X2100 M2/Sun Fire X2200 M2 Server, Just the Facts*	Sales,SEs, Partners	Sales Tool, Training	478548
• *Sun Fire X2100 M2/Sun Fire X2200 M2 Server Technical Presentation*	Sales,SEs, Partners, Customer	Sales Tool, Training	478551
• *Sun Fire X2100 M2/Sun Fire X2200 M2 Server Customer Presentation*	Customer	Sales Tool, Training	478549
Competitive Information			
Competitive Product Feature Matrix and Positioning	Sales, SE, Partners	Competitive Information	See matrix posted on onestop
External Web Sites			
• *Sun Fire X2100 M2 Server Web Site*	**http://www.sun.com/servers/entry/X2100**		
• *Sun Fire X2200 M2 Server Web Site*	**http://www.sun.com/servers/x64/x2200**		
Internal Web Sites			
• *Sun Fire X2100 M2/Sun Fire X2200 M2 Server Internal Web Site*	**http://onestop.eng.sun.com/**, Sun Fire X2100 M2, Sun Fire X2200 M2		
Reseller Web Site			
• *Sun Reseller General Information*	**http://reseller.sun.com**		