

Sun Fire™ X2100 Server

- The Ultimate Price/Performance x64 Server

Just the Facts

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Sun Fire X2100 Server Positioning



Sun Fire X2100 Server – The Ultimate Price/Performance x64 Server

What's new-

01/10/06 – New RoHS compliant Model 180 dual core Opteron processor. The transition of non-compliant RoHS standard configurations. Sun anticipates that the revenue release of the RoHS compliant replacement servers will occur prior to the last order date or the server which is being replaced for compliance purposes.

11/22/05- New RoHS compliant PCI-Express Dual Ethernet cards.

Introduction

The Sun Fire™ X2100 Server is the new 1 to 2-way system in Sun's new line of x64 rack-optimized servers powered by AMD's (Advanced Micro Devices) award winning Opteron™ processors. This single-socket, dual-core capable server is a **superior price/performance 64-bit computing platform** with **Sun's rock-solid capabilities and quality**.

Running the Solaris™ OS, Linux and Windows operating systems – all supported by Sun, the Sun Fire X2100 Server allows customers to run existing 32-bit x86 OS and applications on the same hardware as they migrate to a wide selection of next generation 64-bit operating systems and their choice of applications. These features, combined with its small form factor and low power requirements, can help reduce a customer's acquisition and hosting costs thus increasing return on their IT investments.

This new line of server products helps customers to realize the full economies of scale and the computing flexibility of x64 computing while reducing their operational costs. Featuring an optional IPMI 1.5-based System Management Daughter Card (SMDC), the Sun Fire X2100 Server supports Lights-Out-Management (LOM). LOM technology enables customers to consolidate their system management with remote power control and monitoring capabilities. Customers also have the option of using Sun N1™ System Manager hardware lifecycle management software to manage groups of Sun systems. This software enables rapid discovery, configuration and provisioning of groups Sun servers, and simplifies datacenter management tasks by enabling remote power control, OS patching and monitoring of Sun Fire X2100 Server systems.

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With application portability across the entire Sun server family through binary compatibility, the Sun Fire X2100 Server is the Ultimate Price/Performance x64 Server.

For more information see: <http://www.sun.com/servers/x2100>



Features, Functions, and Benefits

Sun Fire X2100 Server Key Features, Functions, and Benefits

Feature	Function	Benefit
Performance		
A single AMD Opteron processor	<ul style="list-style-type: none"> Supports the latest AMD Opteron dual-core processors, placing 2 CPU cores in a compact form factor Delivers both 32- and 64-bit enterprise-class computing 	<ul style="list-style-type: none"> Nearly doubles computing resources with minimal power and cooling increases. Increases performance while providing investment protection for existing 32-bit applications
HyperTransport Technology and integrated 128-bit wide DDR memory controller	<ul style="list-style-type: none"> Provides a high-speed connection between processor and core logic. Reduces memory bandwidth latency by pooling memory resources onto a single coherent space. 	<ul style="list-style-type: none"> Increases performance by eliminating performance bottlenecks found in traditional x86 Front Side Bus (FSB) architecture.
Operating System and Management Environment		
Sun Support for: <ul style="list-style-type: none"> - Solaris 10 OS on x64 - RHEL 3, 4 and SLES 9 Linux - Windows Server 2003 	<ul style="list-style-type: none"> Run applications on industry standard platform running OS of choice Application portability across the entire family through binary compatibility 	<ul style="list-style-type: none"> Maximize application performance Ease transition to 64-bit computing Maximize IT investment by standardizing hardware to reduce required training and spares
Lights-out Management	<ul style="list-style-type: none"> Optional System Management Daughter Card (SMDC). Provides IPMI 1.5 in-band and out-of-band management. 	<ul style="list-style-type: none"> Enables power control and monitoring of key hardware components. Allows system management to be centralized through grouped management tools such as N1 System Manager
N1 System Manager	<ul style="list-style-type: none"> Optional software provides complete hardware lifecycle management for Sun systems, including the Sun Fire X2100 Server. 	<ul style="list-style-type: none"> Reduces total cost of ownership and increases efficiencies of managing Sun systems Provides fast and easy access to systems for monitoring and maintenance Enables 'one to many' grouped commands, vastly reducing administrator overhead
Expandability with Reliability		
PCI Express	<ul style="list-style-type: none"> Allows connectivity to additional network or storage while supporting full CPU path bandwidth. 	<ul style="list-style-type: none"> Enables flexibility to meet evolving business and application requirements.
Up to 4 GB of DDR memory with ECC	<ul style="list-style-type: none"> ECC helps to ensure data integrity with automatic error correction in case a single bit is affected by such events as alpha particle hitting a memory cell. 	<ul style="list-style-type: none"> Increases memory reliability, helping to reduce the chances of system downtime caused by memory failures.

Feature	Function	Benefit
Dual integrated Gigabit Ethernet	<ul style="list-style-type: none"> Provides outstanding network I/O performance as well as increased network reliability when installed in failover configurations. 	<ul style="list-style-type: none"> Increases network efficiency, flexibility, and availability.

SMDC - Further Information

The X2100 uses a different service processor to the ILOM Service Processor used in the Sun Fire X4100 and X4200 servers. Key feature differences are shown in the table below:

Feature	X2100 SMDC	Sun ILOM (X4100, X4200)
Remote Power/power cycle systems	Yes	Yes
Monitor key system components (CPU, Voltages, Chassis temperature, fans)	Yes	Yes
Comprehensive hardware monitoring	No	Yes
CLI command set	Yes	Yes
Serial & Network Access	Yes	Yes
Dedicated Management Port	No	Yes
SSH support	No	Yes
Console Redirection	Windows & Linux only	Yes
Comprehensive Browser interface	No	Yes
Remote KVM	No	Yes
Remote Media capability	No	Yes
Simple GUI or CLI driven firmware upgrade procedure	No	Yes

For more information about the X2100 SMDC's capabilities and usage guidelines, see the Service Processor (SMDC) section in the <Product Release notes (819-3722-13)> or Appendix C in the <Sun Fire X2100 Server User Guide (819-3721-10)>.

Product Family Placement

The entry-level member in Sun's x64 server family, the Sun Fire X2100 Server is the price/performance solution for customers looking to maximize their computing resources with limited budgets. It replaces the low-end Sun Fire V20z server configurations where Solaris 9 OS support or support for a specific Linux OS version is not required. The Sun Fire X4100 Server is for those customers that are ready to move to later OS releases and need more performance, higher processor density or more extensive RAS features than is available with the Sun Fire X2100 Server.

x64 Server Family Comparison

The following table compares some features of the Sun Fire X2100, Sun Fire X4100 and the Sun Fire V20z servers.

Features	Sun Fire X2100 Server	Sun Fire X4100 Server	Sun Fire V20z Server
CPU type	One AMD Opteron 939-pin CPU socket single or dual-core (up to 2 cores)	Up to 2 AMD Opteron 940-pin single or dual-Core (up to 4 cores)	Up to 2 AMD Opteron 940-pin single or dual-Core (up to 4 cores)
CPU speed	146 (2.0 GHz), 148 (2.2 GHz), 152 (2.6 GHz) Dual-Core – 175 (2.2 GHz)	248 (2.2 GHz), 252 (2.6 GHz), 254 (2.8 GHz), Dual-Core - 270 (2.0 GHz), 275 (2.2 GHz), 280 (2.4 GHz), 285 (2.6 GHz)	242 (1.6 GHz), 244 (1.8 GHz), 248 (2.2 GHz), 250 (2.4 GHz), 252 (2.6 GHz), Dual-Core - 270 (2.0 GHz)
Level 2 cache	1 MB	1MB	1MB
CPU interconnect	1 HyperTransport link (4GB/s per link)	3 HyperTransport links per CPU (4 GB/s per link)	3 HyperTransport links per CPU (3.2 GB/s per link)
Maximum memory - 4 DIMM slots/ CPU socket - installed as pairs	4 GB of DDR1/400 unbuffered ECC DIMMs	16 GB of DDR1/400 ECC registered DIMMs (32 GB when 4 GB DIMMs are available)	16 GB of DDR1/333 or 400 ECC registered DIMMs
Graphics Controller	ATI Rage XL	ATI Rage XL	None

Features	Sun Fire X2100 Server	Sun Fire X4100 Server	Sun Fire V20z Server
Internal HDDs	Up to two SATA (3.5") hot-pluggable HDDs	Up to two (w/ DVD-ROM) or four (w/o DVD-ROM) SAS/SATA (2.5") HDDs hot-swappable	Up to two U320 SCSI HDDs hot-swappable
On-board RAID (two drives req'd)	Mirroring, RAID 1	Striping, Mirroring (RAID 0, 1) (LSI SAS 1064)	Mirroring, RAID 1(LSI 1020)
Network connections	Integrated 2 x Gigabit Ethernet	Integrated 4 x Gigabit Ethernet	Integrated 2 x Gigabit Ethernet
Removable media	DVD-ROM(optional)	DVD-ROM(optional)	CD-ROM/floppy
Expansion Slots	One 64-bit PCI-Express (8-lane)	Two 64-bit PCI-X MD2 Low Profile (1 at 100 MHz, 1 at 66 MHz)	Two 64-bit PCI-X (1 full-length/full height at 133 MHz ¹ , 1 half-length/full height at 66 MHz)
Integrated Service Processor	Optional	Yes	Yes
In-band management	IPMI v1.5	PMI v2.0 via KCS driver SNMP OS-resident agent	IPMI v1.5 and CLI
Out-of-band management	IPMI v1.5	IPMI v2.0;DMTF CLI; SNMP- v1, v2, v3; Web GUI	IPMI v1.5; CLI; SNMP-v1, v2
Remote management features	Remote power on / off, remote access to BIOS	Remote Keyboard, Video, Mouse (KVM), and remote media capability Video redirection, Remote power control, remote access to BIOS, remote FRU status	Remote power on / off, remote access to BIOS, remote FRU status
System management paths	serial port and two system Ethernet ports	A single dedicated management 100BaseT port, system serial port and four system Ethernet ports	Two dedicated management 100BaseT ports, system serial port and two system Ethernet ports
Rack unit height	1U	1U	1U
Depth	21.68 in. 550 mm	25.2 in. 640 mm	28.5 in. (724 mm)
Power supply	Single, Hot-pluggable, 300 W	Redundant, Hot-swappable, 550 W each	Single, 465 W

Features	Sun Fire X2100 Server	Sun Fire X4100 Server	Sun Fire V20z Server
O/S	See http://www.sun.com for latest operating system support for each product		

¹ Note that Sun Fire V20z Server has a BIOS update that reprograms the PCI-X transmit strings to reduce the issues with the 133 MHz PCI-X slot. This is required to resolve the AMD Errata #56 that involves a timing issue at 133 MHz for certain PCI-X cards. However, 4 function PCI-X cards such as the X9273A Quad Gigabit Ethernet card must be deployed/relocated to the 66 MHz slot only. This is a change from the previous deployment in the 133 MHz slot – that is no longer supported. All other PCI-X cards offered by Sun will be still supported in the Sun Fire V20z Server's 133 MHz slot.



Key Messages

Customers seeking a business edge can look to Sun to provide smarter options for building a simple, secure, standardized IT infrastructure. The Sun Fire X2100 Server is a smart solution enabler for standardizing the datacenter- a price/performance platform for the x64 enterprise capable of running any major OS and 32-bit/64-bit application.

Scale Computing... not Complexity

- Horizontal and Vertical Performance
 - World class price/performance for Web, App, and Security server and HPTC/Grid applications
 - Servers that scale 1 to 16 cores
- Fewer Variables...less complexity
 - Common system image...tune on one, deploy everywhere
 - Binary compatibility across entire product line for easier application portability
- Manage One System...not a bunch of boxes...on your schedule
 - Optional Sun N1™ System Manager software centralizes the lifecycle management (configuration, provisioning, monitoring) of groups of systems.
 - Working with or without Sun N1 System Manager, Lights Out Management (LOM) functionality is available via an optional, independent Service Manager Daughter Card (SMDC).

Target Users

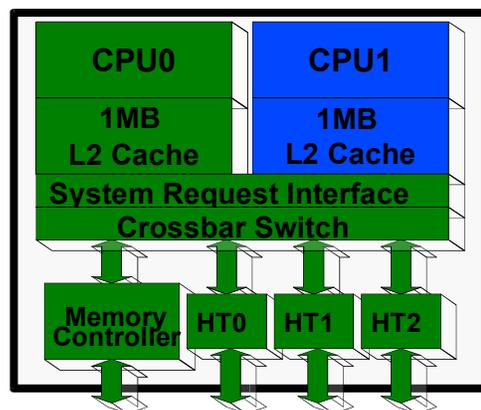
The Sun Fire X2100 Server is targeted at IT managers looking for more cost effective computing solutions to meet their organization's growing computing needs. The Sun Fire X2100 Server helps meet the needs of customers requiring a no-frill, no-RAS/redundancy high performance computing platform. The Sun Fire X2100 Server's will also appeal to System Administrators with ease with system growth and ability to support multiple operating systems.

Vertical Markets

- Service Providers
- Application Developers
- Government
- Oil & Gas
- Pharmaceutical

Horizontal Markets

- Network/IT services (DNS, proxy, caching security)
- Web or application serving, especially Java deployment
- HPC/Grid computing
- Technical Computing



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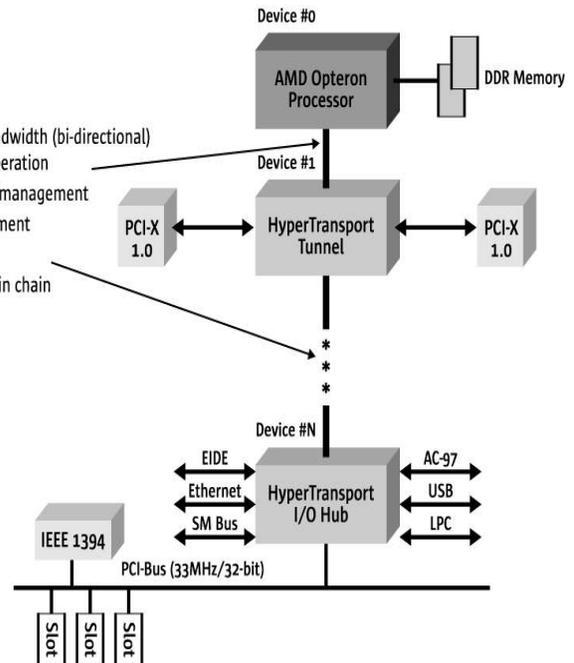
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Availability

General availability for the Sun Fire X2100 Server occurred on November 14, 2005, with Revenue Release on October 28, 2005.

HyperTransport I/O links

- Up to 8.0 GB/sec. total bandwidth (bi-directional) at 16 x 16 bits, 1 GHz operation
- Extensive data protection/management
- Integrated power management
- Building block structure
- Up to 5 devices supported in chain



Enabling Technology

Technology Overview

The Sun Fire X2100 Server is symmetric, multiprocessor, x64-based, rack-optimized server which has the following system architectural features:

- AMD Opteron processor (supporting both dual and single core CPUs)
- HyperTransport technology
- Sun N1™ System Manager

AMD Opteron Processor

The AMD Opteron processor is part of a new computing platform that extends the ubiquitous x86 architecture to accommodate x64 64-bit processing. Formerly known as x86-64, AMD's enhancements to the x86 architecture to allow seamless migration to the superior performance of x64 64-bit technology. AMD's Opteron processor was designed as CMP (Chip-level Multi-processing) from the start with Crossbar Switch and System Request Interface (CPU1 uses 2nd port on SRI). This approach defines a new class of computing by combining full x86 compatibility, a high-performance 64-bit architecture, and the economics of an industry-standard processor.

Major enhancements over legacy x86 include:

- Sixteen 64-bit general-purpose integer registers that quadruple the general-purpose register space available to applications and device drivers as compared to x86 systems.
- Sixteen 128-bit XMM registers for enhanced multimedia performance to double the register space of any current SSE/SSE2 implementation.
- A full 64-bit virtual address space with 40 bits of physical memory addressing and 48 bits of virtual addressing that can support systems with up to 256 terabytes of physical memory.
- 64-bit operating systems to provide full, transparent, and simultaneous 32-bit and 64-bit platform application multitasking.
- A 128-bit wide, on-chip DDR memory controller that supports ECC technologies and provides low-latency memory bandwidth which scales as processors are added.

Dual Core specifics:

- Each core has dedicated 1 MB L2 Cache
- Both cores share the memory controller and HyperTransport interconnects
- Performance characterization of single-core based systems have revealed that the Memory and HyperTransport bandwidths are under-utilized even while running high-end server workloads

Figure 1. Opteron Dual-core CPU Architecture

HyperTransport Technology

The AMD Opteron processor with integrated-in HyperTransport technology links provides a scalable bandwidth interconnect among processors, I/O subsystems, and other chipsets.

HyperTransport technology interconnects:

- Helps to increase overall system performance by removing I/O bottlenecks 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 16 x 16 bits, 1 GHz operation, providing sufficient bandwidth for supporting new interconnects.

Figure 2. Sample HyperTransport technology interconnect block diagram

Sun N1 System Manager - Management of One to Thousands of Sun Systems

Optional Sun N1™ System Manager software provides comprehensive infrastructure life cycle management for Sun systems, delivering an efficient way to manage multiple systems across the datacenter while simplifying management tasks, reducing repetition, and lowering the Total Cost of Ownership of Sun x64 systems. This software enables rapid discovery and provisioning of groups of bare metal Sun Fire X2100, Sun Fire X4100, Sun Fire X4200, Sun Fire V20z and Sun Fire V40z systems. In addition this software also supports SPARC systems: Sun Fire V210, Sun Fire V240, Sun Fire V440, Netra 240, Netra 440, Sun Fire T1000 and T2000 systems.

Key features include:

- Discovery
- Grouping
- Bare Metal OS Provisioning
- Software updates
- Event Logging
- Lights Out Management
- Hardware Monitoring
- OS Monitoring
- Event Notification
- Role Based Access Control
- Hybrid UI with browser and CLI

Note: In order to manage Sun Fire X2100 Server systems with Sun N1 System Manager the optional System Management Daughter Card (SMDC) must be installed in the Sun Fire X2100 Server system.

System Architecture

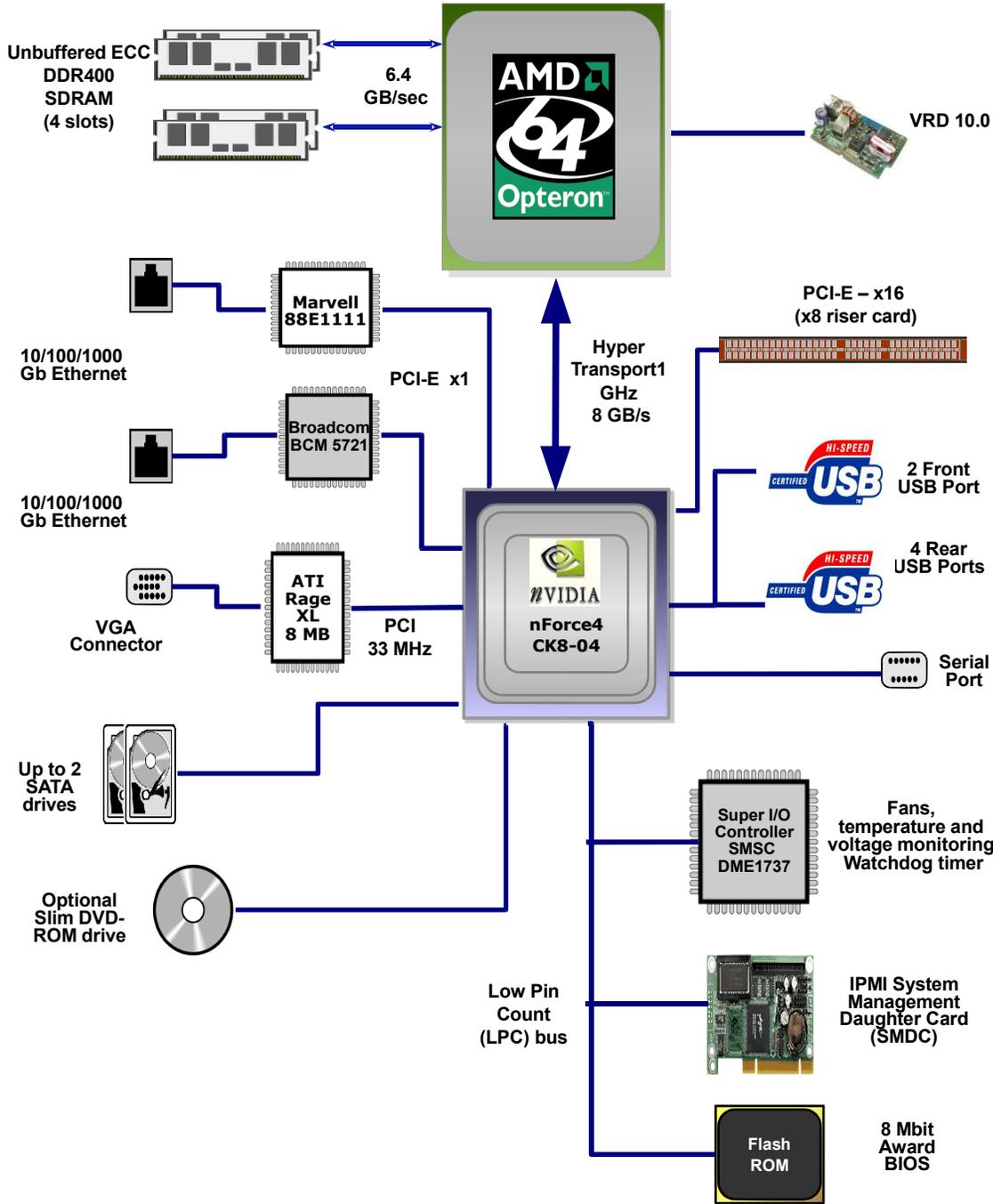


Figure 3. Sun Fire X2100 Server System Architecture



The Sun Fire X2100 Server features a single CPU socket that supports both single- and dual-core AMD Opteron 100 series processors. The processor controls 2 pairs of DIMM slots, with 6.0 GB/sec access between processor and memory. Populated with 1GB DIMMs, the Sun Fire X2100 Server supports up to 4GB of unbuffered DDR1/400 ECC memory. For optimal performance, 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.

Connected through HyperTransport to the CPU, nVidia's nForce 4 integrated bridge/controller chip maximizes real estate efficiency with a single-chip low latency design. The nForce 4 features an on-chip RAID controller, a SATA controller with 4 integrated 3Gb/s ports, an X16 PCI-E link, up to 10 USB 2.0 ports and up to 6 external PCI slots at 33Mhz. Designed around this capability, the Sun Fire X2100 Server provides support for up to two hot-pluggable 3.5" SATA disk drives, a single PCI-E (8-lane) expansion slot, dual Gigabit Ethernet ports, six USB 2.0 ports(2 front, 4 rear), a slim DVD-ROM, video output via ATI's Rage XL chip, and a serial port.

Lights-out management (LOM) is achieved using an optional System Management Daughter Card (SMDC) with an M3290 Baseboard Management Controller BMC). The BMC firmware is IPMI v1.5 compliant and provides the following functions:

- Remotely power up, power down, power recycle, and reset the system
- Remotely monitor system components such as memory, CPU and system voltages as well as CPU and chassis temperature and fans.
- Non-volatile memory storage of System Event Log (SEL)

Reliability, Availability, and Serviceability (RAS)

Reliability

- Simplicity of design with the AMD Opteron processors and HyperTransport requires less components and thus provides higher reliability
- RAID 1 mirroring of the on-board SATA disks
- ECC memory supported

Availability

- The low cost and small form factor of the Sun Fire X2100 Server allow redundant system deployment in a compact space to increase overall service availability.
- Built-in dual Gigabit Ethernet ports provide 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).
- Rear power switch provides easy access.
- Rackmount slide rails for easy installation and removal of a unit are available as an X-option.

Operating System

Sun Fire X2100 Server Operating Systems

A world-class performance platform, the 64-bit Sun Fire X2100 Server 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 its class.

Operating Systems		Single Core Support	Dual Core Support	Factory Installed	Sold by Sun	Supported by Sun
Solaris 10 OS on x64, HW1	64-bit	Yes	Yes	Yes	Yes	Yes
Red Hat Enterprise Linux 3, U6	32-bit	Yes	Yes	No ¹	Yes	Yes
Red Hat Enterprise Linux 3, U6	64-bit	Yes	No	No ¹	Yes	Yes
Red Hat Enterprise Linux 4, U2	64-bit	Yes	Yes	No ¹	Yes	Yes
SUSE Linux Enterprise Server 9, SP1	64-bit	Yes	Yes	No ¹	Yes	Yes
Windows Server 2003 Enterprise Edition, SP1	32-bit/ 64-bit	Yes	Yes	No ²	No	No ³
Windows Server 2003, Standard Edition, SP1	32-bit/ 64-bit	Yes	Yes	No ²	No	No ³

1. Red Hat Enterprise Linux 3, Red Hat Enterprise Linux 4, SUSE Linux Enterprise Server 9, and Solaris OS on x64 can be ordered from Sun. Support contracts are also available.
2. "Designed for Windows" designation as a certified platform, December 2005.
3. Sun System Service Plans for Windows Server 2003 are available from Sun for the Sun Fire X2100, January 2006.

Latest OS Information

For more information on the latest OS support for the Sun Fire X2100 Server, see <http://www.sun.com/servers/entry/x2100/specifications.jsp#OS>

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 who are dissatisfied with high infrastructure costs and security vulnerabilities in their workgroup server environments, the Solaris 10 OS on x64 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 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 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 File System** (zetabyte file system) integrates devices, storage, and file systems structures into a single structure, simplifying file system management and providing a reliable and flexible solution that can help reduce cost, complexity, and risk.
- **Extreme Performance** is delivered with optimization for the latest UltraSparc™, AMD Opteron™ and Intel Xeon processors as well as:
 - **DTrace**, designed for use 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 and performance gains in real-world applications have been optimized to run as much as 30 times faster.
 - **A Unified 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.
- **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** – Expected in a Solaris environment, predictive self-healing technologies provide new levels of application availability with:
 - **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** manages application software running on the system, monitoring applications and restarting entire application trees if necessary.

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, Opteron AMD64 64-bit, and x86 32-bit platforms.
- **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 as well.
- **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.
 - **Six Key Linux Libraries included in Solaris are:** Glib, Gtk+, JPEG, PNG, TIFF, and XML2
 - **Hundreds of Linux applications and libraries** are provided with the Solaris OS including the GNOME desktop.
 - **Solaris Linux Application Environment** 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.

Pricing/Support

Solaris 10 is free to end-users upon registration and is available via free download . Media kits are available for purchase. Support is available at an additional charge.

Linux - Complementing Sun's Solaris Strategy

Key Messaging

Sun, the #1 systems provider, brings a Comprehensive Systems Approach to Linux--providing customers with a full Linux solution of hardware, OS choice with Sun's value added Java Enterprise System, Java Desktop System, tools, and services. Sun enhances standard Linux distributions with an integrated systems offering that includes fully supported OS, x64 rack-mount servers, and the Java Enterprise System that simplifies platform support for customers and partners. Sun brings added value to the system offering with faster, low-cost hardware

which is the primary concern for most Linux customers seeking cost-sensitive server alternatives.

- **Choice and Platform Neutrality – “The right tool for the right job”**

Customers can choose the OS platform to best meet their server to desktop computing needs.

- With Sun's Java Enterprise System for Linux, customers can standardize on a set of Java-based network services across their heterogeneous infrastructure of volume x86 systems based on the Solaris OS or standard Linux to large SMP systems from Sun on x64 or SPARC.
- A growing line of Sun and third-party Intel Xeon and AMD Opteron-based servers allows Linux customers to scale to 64-bit computing

- **Systems Approach - Simplified Operations - One-Stop Linux Support**

Sun brings a complete systems approach to Linux: a value-added web services stack for the entire system, hardware, OS, tools, and applications backed by Sun's global support infrastructure.

- Delivering Linux--from leading vendors (Red Hat and SUSE Linux)--with front-line support and training worldwide from Sun on x64 (Xeon and Opteron) hardware platforms from Sun and third parties.
- Selling the simplest and most comprehensive middleware & web services offering with Java Enterprise System.

- **Optimized Java – Java Everywhere – Broaden the reach of Java investments**

- Sun is focused on maximizing Java performance benefits and stretching customers' application investments by creating a common application engine.
- Linux and Java platform integration - Alliances with Red Hat and SUSE Linux to distribute Sun's latest Java Virtual Machine (JVM) included as part of the OS distributions. (The JVM technology allows the Java 2 Platform to host applications on any computer or operating system without rewrite or recompile).

Pricing/Support

Subscriptions/support are available with or without media (CDs, manuals) at an additional charge. All levels of support provide access to either Red Hat Network or SUSE's Linux Portal. During the support period, if any new versions of SLES or RHEL for AMD64 are made available, users with current support entitlements have access to those new versions from the maintenance sites of Red Hat and SUSE.

Windows OS

The Sun Fire X2100 Server is certified to run the Microsoft Windows Server 2003 Enterprise and Standard Edition operating systems. Sun System Service Plans will be available from Sun Microsystems at an additional charge beginning in January 2006. Please see the “Services” section for more details.

Certification specifics can be found at the following URL:

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<http://www.microsoft.com/windows/catalog/server/default.aspx?subID=22&xslt=category&pgn=856d1339-de5d-49ef-9b45-9248292612f7>

Click on "Server" (not Datacenter). Enter "Sun Fire" in search field to see the available Sun Fire server Windows certifications. The certification encompasses the base server hardware with the supported CPU and memory.



Installation Data

Sun Fire X2100 Server Specifications

Processor Options

Processor	One AMD Opteron Processor 100 Series, single-core (146, 148, 152,154) or dual-core (175) (146= 2.0 GHz) (148 = 2.2 GHz) (152 = 2.6 GHz) (154 = 2.8 GHz) (175=2.2 GHz)
Cache	1 MB Level 2

Main Memory

4 DIMM slots , unbuffered DDR1/400 ECC DIMMs (128 bit plus ECC databus)
System configurations from 1 GB up to 4 GB (512MB and 1GB DIMMs supported). For optimal performance, install DIMMS in pairs.

Standard/Integrated Interfaces

Network	Two 10/100/1000Base-T Ethernet ports
Serial	One Serial TIA/EIA-232-F asynchronous HD-9 Port
SATA	Four channel SATA interface, internal access only.
USB	Two USB 2.0 port (Front), Four USB 2.0 ports (Rear)
Expansion bus	One internal 64-bit PCI-Express slot (8-lane, low-profile, short length)

Mass Storage and Media

Internal disk	Up to two 3.5" SATA hot-pluggable HDDs
Internal DVD-ROM	One EIDE DVD-ROM
External disk	See http://www.sun.com/servers/entry/x2100/storage.html for options

Software

Operating environment	Solaris 10 Operating System on x64, 64-bit Red Hat Enterprise Linux 3, 32-bit/64-bit Red Hat Enterprise Linux 4, 64-bit SUSE Linux 9 Professional 64-bit Windows Server 2003, Enterprise Edition, 32-bit/64-bit Windows Server 2003, Standard Edition, 32-bit/64-bit
Java Enterprise System 3	Solaris 10 on x64 Operating System Standard Linux distributions
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
Management	Optional L SMDC supports IPMI 1.5 (in-band and out-of-band)

Power Supply

UL Maximum (AC Input)	5.13 Amps
Power Supply Rating (DC Output)	300 W
Typical Power Consumption	230 W

Environment

AC power	90–264 V AC (47–63 Hz)
Operating temperature /humidity (single, non-rack system)	5 °C to 35 °C (41 °F to 95 °F), 10% to 90% relative humidity, non-condensing, 27 °C max wet bulb
Nonoperating temperature/humidity (single, non-rack system)	-40 °C to 65 °C (-40° F to 149 °F), up to 93% relative humidity, non-condensing, 38 °C max wet bulb
Altitude (operating) (single, non-rack system)	Up to 3000 m, maximum ambient temperature is derated by 1 °C per 500 m above 500 m
Altitude (nonoperating) (single, non-rack system)	Up to 12000 m

Acoustic Noise Emissions

Declared noise emissions in accordance with ISO 9296, A-weighted, operating and idling:	
Measure & Environment	Sun Fire X2100
LwAd (1B = 10dB) at or below 25C at max ambient	6.6 B (A) idle; 7.6B (A) operating TBD
LpAm bystander at or below 25C at max ambient	TBD TBD

Regulations

Meets or exceeds the following requirements:	
Safety	IEC60950, UL/CSA60950-1, 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	cULus Mark, UL/Demko GS Mark, CE Mark, CCC, GOST R, S-Mark CE Mark (93/68/EEC), Emissions and Immunity Class A Emissions Levels: FCC, VCCI, C-Tick, MIC, *CCC, *GOST R, *BSMI * = Applicable at GA
Other	Labeled per WEEE (Waste Electrical and Electronic Equipment) Directive

Dimensions and Weight

X2100 Chassis	
Height	43 mm (1.69 in.)
Width	425.5 mm (16.75 in.)
Depth	550 mm (21.68 in.)
Weight	18 kg (39.7 lb.) maximum with slide rail kits to

System Requirements, Configuration and Management

System Requirements

The Sun Fire X2100 Server runs the Solaris 10 Operating System on x64 as well as standard Linux distributions and Microsoft Windows Server 2003, Enterprise and Standard Editions. For a list of supported OS versions, please refer to section “Sun Fire X2100 Server Operating Systems Support “

System Configuration

The Sun Fire X2100 server has the following standard components:

- One AMD Opteron Processor 100 Series, single-core (146, 148, or 152) or dual-core (175)
- Four DIMM slots supporting unbuffered DDR1/400 MHz ECC DIMMs
- Two disk drive bays and DVD-ROM (optional)
- Two 10/100/1000Base-T Ethernet ports
- Six USB 2.0 ports (2 front, 4 rear)
- PCI-Express slot (8-lane, half-height, short length)
- AC power supply
- Service Processor via optional System Management Daughter Card (SMDC)
- 19-inch rack-mount kit (optional)
- cable management arm (optional)

Licensing/Usage

The Sun Fire X2100 server can be ordered either with the Solaris 10 OS on x64 edition server license with Java Enterprise Server or Linux from Sun. Solaris 10 on x64 RTU is given when the system is registered with Sun. Windows must be purchased from Microsoft or their partners/resellers.

Sun Fire X2100 Server Supplemental CD

Sun Fire X2100 Servers ship with a supplemental CD. The supplemental CD is a bootable CD which contains the following:

- System BIOS
- Device drivers which are not included in most OS releases.
- System Management card firmware
- Eurosoft PCCheck Diagnostic Software
- Flash utility programs
- Wipedisk utility

MTBF Information

The MTBF (Mean Time Between Failure) for the Sun Fire X2100 server varies depending upon configuration. Operating at 35 °C, the MTBF is predicted by calculations to be up to 22,500 hours.

BTU information

Sun Fire X2100 Server with an AMD dual-core Opteron 175 CPUs (2.2 GHz) was measured at: 230 W = 782 BTUs per hour with 40cu ft/min. Cooling provided by system fans.

Rack Mounting

The Sun Fire X2100 server is 1.7 inches (43 mm) high, 16.7 inches (425 mm) wide and 21.7 inches (550 mm) deep. The air-flow direction is from front to back. I/O ports are located on the rear panels. Informational LEDs are located on the front panel. Access to the power connection is at the rear of the chassis.

Every current SunRack is supported for in-field installation and for shipment pre-installed by Sun (CRS). Field installation in the Sun Fire Expansion Cabinet, the Sun StorEdge Cabinet as well as 3rd party ANSI/EIA 310-D-1992 or IEC 60927 compliant cabinets is supported with the optional Slide Rail Kit (X8029A) and optional Cable Management Arm (X8028A).

The optional slide rail kit is a 4-point mounted slide rail kit and is designed to enable Sun Fire X2100 server 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 kit will include hardware that enables 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.

Rack Density

Sun Fire X2100 system rack density will vary widely based on systems installed, power distribution installation (in-cabinet, external) and power source (single-phase, three-phase) requirements.

Origin statement

The Sun Fire X2100 has components from various countries of origin. The motherboard is manufactured in China. The power supply/chassis are manufactured in China. The commodity parts such as disk drives, memory, and CPU come from a variety of countries.

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

Hardware Global compliance

Hardware Global compliance for this product complies with the guidelines as specified for hardware at: <http://global.eng/compliance/i18n/10nbigrules.html>

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

Ordering Information

Sun Fire X2100 Server Factory Standard Configurations:

Part Number	Description	Availability
A75-LYZ1-N-512-AL8	Sun Fire X2100 x64 Server: AMD Opteron Model 146 processor (2.0Ghz/1MB), 1x 512MB unbuffered ECC PC3200 DDR-400 memory, no hard disk, no DVD, 2x 10/100/1000 Ethernet ports, 6x USB 2.0 ports, 1x PCI-Express x8 slot, no power cord, order Geo-specific x-option. Standard Configuration. RoHS-6.	RR – 04/18/6 GA – 04/28/06
A75-LFZ1-H-1GB-FA8	Sun Fire X2100 x64 Server: AMD Opteron Model 148 processor (2.2Ghz/1MB), 2x 512MB unbuffered ECC PC3200 DDR-400 memory, 80GB 7,200-RPM Serial ATA disk, no DVD, 2x 10/100/1000 Ethernet ports, 6x USB 2.0 ports, 1x PCI-Express x8 slot, no power cord, order Geo-specific x-option. Standard Configuration. RoHS-6.	RR – 04/18/6 GA – 04/28/06
A75-LPZ1-H-2GB-FA8	Sun Fire X2100 x64 Server: AMD Opteron Model 154 processor (2.8Ghz/1MB), 2x 1GB unbuffered ECC PC3200 DDR-400 memory, 1x 80GB 7,200-RPM Serial ATA disk, no DVD, 2x 10/100/1000 Ethernet ports, 6x USB 2.0 ports, 1x PCI-Express x8 slot, no power cord, order Geo-specific x-option. Standard Configuration. RoHS-6.	RR – 04/18/6 GA – 04/28/06
A75-BZZ1-H-2GB-FA8	Sun Fire X2100 x64 Server: AMD Opteron Model 180 dual core processor (2.4Ghz/1MB), 2x 1GB unbuffered ECC PC3200 DDR-400 memory, 1x 250GB 7,200-RPM Serial ATA disk, no DVD, 2x 10/100/1000 Ethernet ports, 6x USB 2.0 ports, 1x PCI-Express x8 slot, no power cord, order Geo-specific x-option. Standard Configuration. RoHS-6.	RR – 04/18/6 GA – 04/28/06

Sun Fire X2100 Server XATO Chassis Option:

Part Number	Description	Availability
A75-ZA	Sun Fire X2100 x64 Server XATO Base System: Chassis, Motherboard, 1x processor slot, 4x memory DIMM slots, 2x Serial ATA disk bays, 1x DVD bay, 2x 10/100/1000 Ethernet ports, 6x USB 2.0 ports, 1x PCI-Express x8 slot, no power cord, order Geo-specific X-option. XATO only. RoHS-6.	RR – 04/18/6 GA – 04/28/06

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

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/Asia (except China) Localized power cord kit
X312E	(China) Localized power cord kit

Part Number	Description
X312F	(Brazil) Localized power cord kit
X312G	(Korea) Localized power cord kit
X312L	(Continental Europe) Localized power cord kit
X314L	(Switzerland) Localized power cord kit
X317L	(U.K.) Localized power cord kit
X332A	(Taiwan) Localized power cord kit
#180-1995	(Danish) Localized power cord kit
X383L	(Denmark) Localized power cord kit
X384L	(Italian) Localized power cord kit
X386L	(Australian) Localized power cord kit

Sun Fire X2100 Server CRS Systems:

The CRS systems are “Customer Ready Systems” that are custom-built by the CRS team. These systems are identical to their Standard configuration counterparts, but require CRS-specific part numbers in order for the factory to build them.

CRS Part Number	Description	Availability
A75-LYZ1N512AL8-IP	Sun Fire X2100 x64 Server: AMD Opteron Model 146 processor (2.0Ghz/1MB), 1x 512MB unbuffered ECC PC3200 DDR-400 memory, no hard disk, no DVD, 2x 10/100/1000 Ethernet ports, 6x USB 2.0 ports, 1x PCI-Express x8 slot, no power cord, order Geo-specific x-option. Standard Configuration. RoHS-6.	RR – 04/18/6 GA - 04/28/06
A75-LFZ1H1GBFA8-IP	Sun Fire X2100 x64 Server: AMD Opteron Model 148 processor (2.2Ghz/1MB), 2x 512MB unbuffered ECC PC3200 DDR-400 memory, 80GB 7,200-RPM Serial ATA disk, no DVD, 2x 10/100/1000 Ethernet ports, 6x USB 2.0 ports, 1x PCI-Express x8 slot, no power cord, order Geo-specific x-option. Standard Configuration. RoHS-6.	RR – 04/18/6 GA – 04/28/06
A75-LPZ1H2GBFA8-IP	Sun Fire X2100 x64 Server: AMD Opteron Model 154 processor (2.8Ghz/1MB), 2x 1GB unbuffered ECC PC3200 DDR-400 memory, 1x 80GB 7,200-RPM Serial ATA disk, no DVD, 2x 10/100/1000 Ethernet ports, 6x USB 2.0 ports, 1x PCI-Express x8 slot, no power cord, order Geo-specific x-option. Standard Configuration. RoHS-6.	RR – 04/18/6 GA – 04/28/06
A75-BZZ1H2GBFA8-IP	Sun Fire X2100 x64 Server: AMD Opteron Model 180 dual core processor (2.4Ghz/1MB), 2x 1GB unbuffered ECC PC3200 DDR-400 memory, 1x 250GB 7,200-RPM Serial ATA disk, no DVD, 2x 10/100/1000 Ethernet ports, 6x USB 2.0 ports, 1x PCI-Express x8 slot, no power cord, order Geo-specific x-option. Standard Configuration. RoHS-6.	RR – 04/18/6 GA – 04/28/06

Sun Fire X2100 Server (X)ATO Options:

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

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X-Option	XATO	CRS	Description	Availability
-	8071A-Z	-	AMD Opteron Model 146 (2.0 GHz single-core CPU) for Sun Fire X2100 x64 server.	RR – 04/18/6 GA – 04/28/06
-	8072A-Z	-	AMD Opteron Model 148 (2.2 GHz single-core CPU) for Sun Fire X2100 x64 server.	RR – 04/18/6 GA – 04/28/06
-	8073A-Z	-	AMD Opteron Model 152 (2.6 GHz single-core CPU) for Sun Fire X2100 x64 server.	RR – 04/18/6 GA – 04/28/06
-	8074A-Z	-	AMD Opteron Model 154 processor (2.8GHz/1MB single-core CPU) for Sun Fire X2100 x64 server.	RR – 04/18/6 GA – 04/28/06
-	8085A-Z	-	AMD Opteron Model 175 (2.2 GHz dual-core CPU) for Sun Fire X2100 x64 server.	RR – 04/18/6 GA – 04/28/06
-	8084A-Z	-	AMD Opteron Model 180 (2.4GHz dual-core CPU) for Sun Fire X2100 x64 server.	RR – 04/18/6 GA – 04/28/06
X8006A-Z	8006A-Z	8006A-Z	2GB DDR1/400 Unbuffered ECC DIMMs (2x1GB)	RR – 04/18/6 GA – 04/28/06
X8007A-Z	8007A-Z	8007A-Z	1GB DDR1/400 Unbuffered ECC DIMMs (2x512 MB)	RR – 04/18/6 GA – 04/28/06
X8082A-Z	8082A-Z	8082A-Z	DVD-ROM Drive for Sun Fire X2100 Server	RR – 04/18/6 GA – 04/28/06
-	8088A-Z	-	Filler Panel for disk bay	RR – 04/18/6 GA – 04/28/06
-	8089A-Z	-	Filler Panel for DVD bay	RR – 04/18/6 GA – 04/28/06
X8078A-Z	8078A-Z	8078A-Z	250GB 7200 RPM 3.5" SATA disk drive	RR – 04/18/6 GA – 04/28/06
X8079A-Z	8079A-Z	8079A-Z	80GB 7200 RPM 3.5" SATA disk drive	RR – 04/18/6 GA – 04/28/06
X8081A-Z	8081A-Z	8081A-Z	IPMI 1.5 System Management Daughter Card	RR – 04/18/6 GA – 04/28/06
X8082A-Z	8082A-Z	8082A-Z	DVD-ROM drive for Sun Fire X2100 x64 server	RR – 04/18/6 GA – 04/28/06
X8028A-Z	8028A-Z	8028A-Z	Cable Mgmt Arm for Sun Fire X2100, X4100 and X4200 servers	RR – 04/18/6 GA – 04/28/06
X8029A-Z	8029A-Z	8029A-Z	X2100, X4100 and X4200 Rack-Mount Rail Kit	RR – 04/18/6 GA – 04/28/06
SG-XPCIE2FC-QF4	-	SG-PCIE2FC-QF4	Sun StorEdge 4 Gb Dual Port Fibre Channel PCI-Express Card (Qlogic). RoHS-6.	RR – 04/18/6 GA – 04/28/06

X-Option	XATO	CRS	Description	Availability
SG-XPCIE1FC-QF4	-	SG-PCIE1FC-QF4	Sun StorEdge 4 Gb Single Port Fibre Channel PCI-Express Card (Qlogic). RoHS-6.	RR – 04/18/6 GA – 04/28/06
SG-XPCIE2FC-EM4	-	SG-PCIE2FC-EM4	Sun StorEdge 4 Gb Dual Port Fibre Channel PCI-Express Card (Emulex). RoHS-6.	RR – 04/18/6 GA – 04/28/06
SG-XPCIE1FC-EM4	-	SG-PCIE1FC-EM4	Sun StorEdge 4 Gb Single Port Fibre Channel PCI-Express Card (Emulex). RoHS-6.	RR – 04/18/6 GA – 04/28/06
X7280A-2	-	X7280A-2	Sun PCI-E Low profile Dual GigE UTP ,low profile bracket on board. RoHS-6 compliant. Standard bracket included in X-option. RoHS-6.	RR – 04/18/6 GA – 04/28/06
X7281A-2	-	X7281A-2	Sun PCI-E Low-Profile Dual GigE MMF,low profile bracket on board. RoHS-6 compliant Standard bracket included in X-option. RoHS-6.	RR – 04/18/6 GA – 04/28/06
X1236A-Z	-	1236A-Z	Infiniband PCI-Express Card. RoHS-6.	RR – 04/18/6 GA – 04/28/06
-	8092A	-	Solaris 10 U1/JES4 64-bit pre-installation on 800 GB SATA disk	RR
-	8091A	-	Solaris 10 U1/JES4 64-bit pre-installation on 250 GB SATA disk	RR
-	8093A	-	Solaris 10 U1/JES4 64-bit pre-installation on 500 GB SATA disk	RR

General Configuration Notes:

1. 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.
2. A combination of 80 GB and 250 MB SATA drives is supported. If onboard RAID 1 mirroring is going to be used, it requires identically-sized drives.
3. For the latest information on PCI-Express card support, please see:
<http://www.sun.com/servers/entry/x2100/optioncards.jsp>

XATO Configuration Notes:

1. 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 the minimum memory or disk required.
2. A minimum of one CPU option required.
3. A minimum of one memory option is required.

4. Systems with additional PCI-Express expansion cards installed are not available via XATO. Customers must order the X-options and install at their site or order systems through CRS.
5. For a diskless configuration, two 8088A (Filler Panel for disk bay) are required. For configurations with a single disk, one minimum of one 8088A (Filler Panel for disk bay) are required.
6. A DVD-ROM is required unless option 8089A is also selected.

Sun Fire X2100 PCI-X card support by OS

Part numbers are designated as X-option/XATO. For more information on individual PCI-X cards, please visit: <http://www.sun.com/servers/entry/x2100/optioncards.jsp>

<i>Option Card</i>	<i>Solaris 10 on x64</i>	<i>Red Hat RHEL 3.0 (32-bit)</i>	<i>Red Hat RHEL 3.0 (64-bit)</i>	<i>Red Hat RHEL 4.0 (64-bit)</i>	<i>Novell SUSE SLES 9 (64-bit)</i>	<i>Windows 2003 (32-bit)</i>	<i>Windows 2003 (64-bit)</i>
SG-XPCIE2FC-QF4	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SG-XPCIE1FC-QF4	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SG-XPCIE2FC-EM4	Yes In Solaris 10 U1 OS	Yes	Yes	Yes	Yes	Yes	Yes
SG-XPCIE1FC-EM4	Yes In Solaris 10 U1 OS	Yes	Yes	Yes	Yes	Yes	Yes
X7280A-2	Yes	Yes	Yes	Yes	Yes	Yes	Yes
X7281A-2	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Services

Warranty Support

The Sun Fire X2100 Server has a three year, next business day warranty.

Duration:	3 years 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 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 every phase of the project's life cycle.

Sun provides a service plan to meet every customer's needs: the SunSpectrumSM Service Plan for full system support ranging from basic to mission critical service levels, SunSM 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 Server.

- SunSpectrumTM Service Plans: Get integrated hardware and Solaris support via the support program acclaimed by industry analysts*
- SunSM 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
- Proven return on investment * 1

*1 Based on Total Economic Impact Study by Forrester Research. This study is available at:
sun.com/service/support/sunspectrum

SunSpectrum Service Plans				
Features	Platinum Service Plan Mission-critical Systems	Gold Service Plan Business-critical Systems	Silver Service Plan Basic System Support	Bronze Service Plan Self-Maintenance Support
Telephone and Online Technical Support	24/7 Live transfer	24/7 Live transfer	8-8, M-F Live transfer	8-5, M-F 4hr response
One-stop Interoperability Assistance	Yes	Yes	No	No
Hardware Service Coverage	24/7 2hr On-site Service	8-8, M-F 4hr On-site Service	8-5, M-F 4hr On-site Service	Replacement parts 2nd business day
Solaris™ Releases	Yes	Yes	Yes	Yes
On-demand Solaris™ Updates	Yes	Yes	Yes	Yes
Online System Admin Resources	Yes	Yes	Yes	Yes
Support Notification Services	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 an annual SunSpectrum contract minimum (approximately \$160,000 USD) can receive additional services including the creation of a personalized support plan, periodic support reviews, patch assessments and educational services. For local qualification criteria, visit sun.com/service/support/localinfo.html			
<ul style="list-style-type: none"> • Availability of specific features, coverage hours and response times may vary by location or product. • 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. 				

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Warranty Upgrade to SunSpectrum Service for Sun Fire X2100 Server

The following are part numbers and descriptions for the warranty upgrade to SunSpectrum Service

Part Number	Description
W9D-A75-1S	Upgrade to 1 year SunSpectrum Silver for Sun Fire X2100 Server
W9D-A75-2S	Upgrade to 2 years SunSpectrum Silver for Sun Fire X2100 Server
W9D-A75-3S	Upgrade to 3 years SunSpectrum Silver for Sun Fire X2100 Server
W9D-A75-1G	Upgrade to 1 year SunSpectrum Gold for Sun Fire X2100 Server
W9D-A75-2G	Upgrade to 2 years SunSpectrum Gold for Sun Fire X2100 Server
W9D-A75-3G	Upgrade to 3 years SunSpectrum Gold for Sun Fire X2100 Server
W9D-A75-24-1G	Upgrade to 1 year SunSpectrum Gold 7x24 for Sun Fire X2100 Server
W9D-A75-24-2G	Upgrade to 2 years SunSpectrum Gold 7x24 for Sun Fire X2100 Server
W9D-A75-24-3G	Upgrade to 3 years SunSpectrum Gold 7x24 for Sun Fire X2100 Server
W9D-A75-1P	Upgrade to 1 year SunSpectrum Platinum for Sun Fire X2100 Server
W9D-A75-2P	Upgrade to 2 years SunSpectrum Platinum for Sun Fire X2100 Server
W9D-A75-3P	Upgrade to 3 years SunSpectrum Platinum for Sun Fire X2100 Server

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:

- 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)	Global Service Plan (Business Critical Systems)	Standard Service Plan (Same Day Support)	Basic Service Plan (Non-Critical Support)
Telephone and Online Technical Support	24/7 Live transfer	24/7 Live transfer	8-8, M-F Live transfer	8-5, M-F 4hr response
Hardware Service Coverage	24/7 2hr onsite	8-8, M-F 4hr onsite	8-5, M-F 4hr onsite	Replacement Parts 2nd Business Day
Online System Admin Resources	Yes	Yes	Yes	Yes
Support Notification Services	Yes	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 shown are for service requests designated by the customer as "Priority 1".

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Warranty Upgrade to Sunsm System Service Plans for Windows OS for Sun Fire X2100 Server

The following are part numbers and descriptions for the warranty upgrade to Sunsm System Service Plans for Windows OS

Part Number	Description
W9D-A75W-1S	Upgrade to 1 year Sun Windows Standard Support for Sun Fire X2100 Server
W9D-A75W-2S	Upgrade to 2 years Sun Windows Standard Support for Sun Fire X2100 Server
W9D-A75W-3S	Upgrade to 3 years Sun Windows Standard Support for Sun Fire X2100 Server
W9D-A75W-1G	Upgrade to 1 year Sun Windows Global Support for Sun Fire X2100 Server
W9D-A75W-2G	Upgrade to 2 years Sun Windows Global Support for Sun Fire X2100 Server
W9D-A75W-3G	Upgrade to 3 years Sun Windows Global Support for Sun Fire X2100 Server
W9D-A75W-1P	Upgrade to 1 year Sun Windows Premium Support for Sun Fire X2100 Server
W9D-A75W-2P	Upgrade to 2 years Sun Windows Premium Support for Sun Fire X2100 Server
W9D-A75W-3P	Upgrade to 3 years Sun Windows Premium Support for Sun Fire X2100 Server

Sun Hardware Only Service Plan

If you are purchasing a Sun Fire X2100 Server from Sun that uses Red Hat Linux or SUSE Linux, the SunSpectrum Service Plan outlined above is not the best choice. In it's place, Sun offers multiple on-site Hardware Service Plans (next business day, same business day and 4 hrs (24/7)) as well as support and updates for the operating system through Sun Software Service Plans (see Software Support section). Sun Hardware 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 Plan, Sun Fire X2100 customers benefit from the choice of three levels of service to best match their business needs corresponding to three 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.

Warranty Upgrade to Sun HW Only Service for Sun Fire X2100 Server

The following are part numbers and descriptions for the warranty upgrade to Sun HW Only Service

Part Number	Description
W9D-A75-SD-1H	Upgrade to 1 year Sun HW Only SBD for Sun Fire X2100 Server
W9D-A75-SD-2H	Upgrade to 2 years Sun HW Only SBD for Sun Fire X2100 Server
W9D-A75-SD-3H	Upgrade to 3 years Sun HW Only SBD for Sun Fire X2100 Server
W9D-A75-24-1H	Upgrade to 1 year Sun HW Only 7x24 for Sun Fire X2100 Server
W9D-A75-24-2H	Upgrade to 2 years Sun HW Only 7x24 for Sun Fire X2100 Server
W9D-A75-24-3H	Upgrade to 3 years Sun HW Only 7x24 for Sun Fire X2100 Server

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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	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.
10/100/1000Base-T	
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/s.
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			
• <i>Sun Fire X2100 Server Datasheet</i>	Customer	Sales Tool, Training	440506
• <i>Services for Sun Fire x64 Servers Datasheet</i>	Customer	Sales Tool, Training	450493
• <i>Sun Fire X2100 Server Technical White Paper</i>	Customer	Sales Tool, Training	450105
• <i>Sun Fire X2100 Server Reviewer's Guide</i>		Sales Tool, Training	449366
Sales Tools			
• <i>Sun Fire X2100 Server, Just the Facts</i>	Sales, SEs, Partners	Sales Tool, Training	449365
• <i>Sun Fire X2100 Server Technical Presentation</i>	Sales, SEs, Partners, Customer	Sales Tool, Training	449503
• <i>Sun Fire X2100 Server Customer Presentation</i>	Customer	Sales Tool, Training	449504
• <i>Sun Fire X2100 Server Sales Training Presentation</i>	Sales, SEs, Partners	Training	440505
Competitive Information			
• <i>Beating Dell with the Sun Fire X2100 Server</i>	Sales, SEs	Sales Tool, Training	440121
• <i>Beating HP with the Sun Fire X2100 Server</i>	Sales, SEs	Sales Tool, Training	440120
• <i>Beating IBM with the Sun Fire X2100 Server</i>	Sales, SEs	Sales Tool, Training	449119
External Web Sites			
• <i>Sun Fire X2100 Server Web Site</i>	http://www.sun.com/servers/entry/X2100		
Internal Web Sites			
• <i>Sun Fire X2100 Server Internal Web Site</i>	http://onestop.central/		
Reseller Web Site			
• <i>Sun Reseller General Information</i>	http://reseller.sun.com		

Internal Information

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Competitive Information

Competitive beat sheets are posted regularly to <http://competitive.central>. These reports contain information about competitor's products, the strengths and weaknesses of the Sun Fire X2100 Server versus competitors' products, and positioning information. A summary of the Sun Fire X2100 versus the leading competition is shown below.

Sun Fire X2100 Server

	<i>Sun Fire X2100 Server</i>	<i>IBM eserver x306</i>	<i>Dell PowerEdge™ 850 Server</i>	<i>HP ProLiant DL320 G3 Server</i>
Number of processors	1	1	1	1
CPU	AMD Opteron(single- and dual-core)	Intel Pentium 4	Intel Celeron, Pentium 4, Pentium D (dual-core)	Intel Pentium 4
L2 Cache	1 MB	1 MB	256KB, Celeron, 1 MB P4, 2 MB P4 3.6GHz, 2x1 MB PD	2 MB
CPU interconnect	1 HyperTransport	FSB (Front Side Bus) at 800MHz	FSB (Front Side Bus) at 800MHz	FSB (Front Side Bus) at 800MHz
Min/max memory	1-4 GB	512MB-4 GB	1-8 GB	1-4 GB
O/S	Solaris 10 OS on x64/Linux/Windows	Windows/Linux	Windows/Linux/ Netware/	Windows/Linux
Internal HDD number/type	2 SATA; hot-pluggable	2 SATA; non-hot-pluggable	2 SATA or Ultra320 SCSI; non-hot-pluggable	2 SATA or SCSI; non-hot-pluggable
Raid	Embedded RAID 0/1	RAID 0/1	RAID 0/1	Embedded SATA RAID 0/1
Expansion slots	1PCI Express (8 lane)	2 64-bit/66MHz PCI-X	1 64-bit/133MHz PCI-X, 1 PCI Express (x8) or 2 PCI Express (1 x8, 1 x4)	1 64-bit/133MHz, 1 64-bit/100MHz PCI-X PCI-Express (optional)
Ethernet ports	2 x 10/100/1000	2 x 10/100/1000	2 x 10/100/1000	2 x 10/100/1000
Height	1U	1U	1U	1U
Power Supply	300 W	300 W	345 W	350 W
Remote management	SMDC(optional)	Partial, RSA-II (optional)	DRAC IV (optional)	Systems Insight Management
Warranty	3 year next business day onsite	1 year next business day onsite	3 year next business day onsite	3 year limited; 1 year next business day, 2nd-3 rd year parts only

Sun Fire X2100 Server vs. Competition (IBM,HP,Dell) Operating System Advantages:

- Competition offers no free RTU for an enterprise class UNIX like Solaris™ 10 OS that is offered with the Sun Fire X2100.
- Competition offers no free virtualization software like the Solaris™ 10 Container software that is offered with the Sun Fire X2100 Server.

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Sun Fire X2100 Server vs. Competition (IBM,HP,Dell) Hardware Advantages:

- Higher bandwidth with HyperTransport technology compared with FSB bottlenecks inherent in the Intel architecture.
- Competition does not offer hot-pluggable HDDs. HP ProLiant DL320 G3 does not have pluggable fans or hard drives .
- Lower price and high performance results over competitive 1U Intel Xeon Servers
- Lower power consumption over Intel 1U competition

Sun Fire X2100 Server vs. IBM eServer 306 Hardware Advantages:

- No On-chip memory controller like AMD Opteron processor design
- x306 has only a single socket, single core –no dual-core upgrade is available like the Sun Fire X2100 Server
- No standard RAID on the x306
- x306 doesn't offer the Opteron processor and its HyperTransport, Direct Connect Architecture, instead the x306 offers a Pentium 4 and its basic FSB bottlenecked design
- Sun Fire X2100 Server supports processor upgrades to faster single cores (up to 2.6GHz) and to dual-core (2.2GHz)

Service Processor Comparison

Service Processor Comparison

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Feature	NSG Sps			Competition					
	Sun			HP		IBM		Dell	
	Sun Fire V20z & V40z	ILOM 1.0 (Sun Fire X4100, X4200)	Sun Fire X2100	HP iLO Standard Pack	HP iLO Advanced Pack	IBM eServer 325/326 (AMD-based) – BMC, no RSA option available	IBM xSeries (Intel-based) BMC + RSA II	Dell Server Administrator 2.0 (Installs on top of OS) + BMC	Dell Server Administrator 2.0 + Dell Remote Access Card (DRAC)
SP Cost (per server)	\$0	\$0	\$149	\$0	\$349	\$0	\$399	\$0	\$299
Interfaces									
Virtual media capability	X	○	X	X	○	X	○	X	○
Remote KVM	X	○	X	X	○	X	○	X	○
Fully comprehensive CLI	○	○	X	○	○	X	○	○	○
DMTF 'SMASH' CLP support	X	○	X	○	○	X	○	X	X
Browser-based GUI (English, i18n)	X	○	X	○	○	X	○	○	○
Serial Over LAN capability	○	○	○*	○	○	○	○	○	○
Dedicated 10/100 Management Port	○	○	X	○	○	X	○	X	?
Security									
SSH 2.0	○	○	X	○	○	X	○	○	○
LDAP support	○	○	X	○	○	X	○	X	X
RADIUS support	X	X	X	○	○	X	X	X	X
RBAC	○	○	X	○	○	○	○	○	○
Microsoft Active Directory	X	X	X	X	○	○	○	○	○
Initial password allocation	○	○	○	○	○	○	○	?	?
Password reset capability	○	○	○	○	○	○	○	?	?
Standards support									
IPMI v1.5	○	○	○	X	X	○	○	○	○
IPMI v2.0	X	○	X	X	X	X	X	X	X
SNMP V1	○	○	X	○	○	X	○	○	○
SNMP V2c	○	○	(trap only)	○	○	X	○	○	○
SNMP V3	X	○	X	○	○	X	○	○	○
Monitoring & Logging									
SNMP Monitoring	○	○	X	○	○	X	○	○	○
SNMP Management	○	X	X	○	○	X	○	○	○
Monitoring of FRUs/components	○	○	Limited**	○	○	○	○	○	○
Email/Pager/SMS notification of alerts	○	X	X	○	○	X	○	○	○
Watchdog Timer	○	○	○	○	○	○	○	○	○
Event Logging	○	○	○	○	○	○	○	○	○
Configurable Alert Thresholds	○	○	○	○	○	○	○	○	○
Auditing Capability	X	X	X	X	X	X	X	X	X
Access									
Access to SP while powered down	○	○	○	○	○	○	○	X	○
Multiple User Account administration	○	○	○	○	○	○	○	○	○
Control									
Forced Power Off	○	○	○	○	○	○	○	X	○
Graceful Shutdown	○	○	X	○	○	○	○	○	○
LED identification	○	○	X	○	○	○	○	○	○
FRU/component data accessible	○	○	○	○	○	○	○	○	○
Other									
Upgradeable firmware/BIOS	○	○	○	○	○	○	○	○	○
Remote control of system LEDs	○	○	X	○	○	○	○	○	○
Non-Volatile SP Flash memory	○	○	○	○	○	○	○	○	○