

Sun Ultra 20 Workstation

Just the Facts

SunWIN Token # 443533

Version January 13, 2006: This version supercedes all previous versions.
Please send all corrections to brian.huynh@sun.com

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1.0 The Sun Ultra 20 Workstation

Introduction

The Sun Ultra 20 Workstation, the second workstation in a new line of AMD Opteron-based workstations, demonstrates Sun's commitment in delivering the most compelling x64-based workstation portfolio in the industry. With a single architecture, Sun Ultra 20 Workstation supports both 32-bit and 64-bit operating systems and applications, offering high flexibility for customers who want to run existing 32-bit operating systems and applications and at the same time, migrate to the next-generation 64-bit operating systems and applications.



Figure 1-1: Angled view of the Sun Ultra 20 Workstation.

Above all, the Sun Ultra 20 Workstation meets or exceeds the buying criteria of the discerning workstation buyer, at a price-performance ratio not previously available from Sun. “Entry-level” only from a pricing perspective, the Sun Ultra 20 Workstation is inherently a workstation worthy to be placed in the critical path of mission-critical projects.

Product Family Placement

The Sun Ultra 20 Workstation complements and broadens Sun's workstation portfolio. With respect to SPARC-based workstations, whereas the Sun Blade 150 workstation and Sun Blade 1500 workstation offer the best SPARC® systems running with the proven and robust Solaris™ operating systems for customers who have standardized on SPARC-based systems and demand binary compatibility from 1-way to 106-way systems in their IT deployment, the Sun Ultra 20 Workstation offers the best performance for x64 applications in a mini-tower workstation and addresses customer needs for compatibility of x64 32-bit applications with the seamless ability to move into the future of 64-bit computing.

Comparison: Sun Ultra 20 Workstation versus Sun Blade 150 Workstation and Sun Blade 1500 Workstation

The Sun Ultra 20 Workstation will enable customers to:

- Run both 32-bit x64 and 64-bit x64 applications
- Get more performance / \$
- Run more applications (Solaris OS, Linux, and Windows)
- Acquire a 64-bit x64 workstation at a starting list price of \$895 (USD)

The Sun Blade 150 Workstation and Sun Blade 1500 Workstation are ideal for customers who:

- Want to protect their investments in the SPARC/Solaris knowledge base
- Require binary compatibility with Sun SPARC processors
- Want to run particular applications available only on SPARC/Solaris

Table 1-1 shows a comparison of the Sun Ultra 20 Workstation versus the Sun Blade 150 Workstation and the Sun Blade 1500 Workstation.

Table 1-1: Sun Ultra 20 Workstation and Sun Blade 150 and Sun Blade 1500 Feature Comparison

| Features | Sun Ultra 20 Workstation | Sun Blade 150 | Sun Blade 1500 |
|----------------------------|---|--|--|
| Number of Processor Socket | One | One | One |
| Processor Type | AMD Opteron Processor 939-pin, 100-series Single-core and Dual-core | Sun UltraSPARC IIe Processor | Sun UltraSPARC IIIi Processor |
| Processor Speed Grade(s) | <ul style="list-style-type: none"> • Dual 2.4GHz cores (Model 180) • Single 1.8GHz core (Model 144) • Single 2.2GHz core (Model 148) • Single 2.6GHz core (Model 152) • Single 2.8GHz core (Model 154) | <ul style="list-style-type: none"> • 650MHz / 256KB • 550MHz / 256KB | <ul style="list-style-type: none"> • 1.5GHz / 1MB |
| Level 2 cache | 1 MB | 256MB | 1 MB |
| Front Side Bus | HyperTransport™ (8 GB/s per link) | PCI (32-bit @ 33MHz) | J-Bus (128-bit @ 167MHz) |

| Features | Sun Ultra 20 Workstation | Sun Blade 150 | Sun Blade 1500 |
|---------------------------------------|---|--|--|
| Memory | <ul style="list-style-type: none"> 4GB @ PC3200 4 DIMM slots Un-buffered DIMMs only ECC (1GB, 512MB) or non-ECC (256MB) | <ul style="list-style-type: none"> 2GB @ PC133 4 DIMM slots Registered DIMMs only ECC only | <ul style="list-style-type: none"> 8GB @ PC2100 4 DIMM slots Registered DIMMs only ECC only |
| Graphics Accelerators | <ul style="list-style-type: none"> NVIDIA FX3450 NVIDIA FX1400 NVIDIA FX540 NVIDIA NVS285 PCI-Express ATI RageXL (on-board) | <ul style="list-style-type: none"> Sun XVR-1200 Sun XVR-600 Sun PGX64 (on-board) | <ul style="list-style-type: none"> Sun XVR-1200 Sun XVR-600 Sun XVR-100 |
| Networking | On-board 1 x Gigabit Ethernet | On-board 100Mb Ethernet | On-board 1 x Gigabit Ethernet |
| Optical Drives | <ul style="list-style-type: none"> DVD-ROM (Option) DVD Dual (Option) | <ul style="list-style-type: none"> CD-RW (Standard) DVD-ROM (Option) | DVD-ROM (Standard) |
| Floppy Disk Drive | None | One 3.5-in 1.44 MB floppy | None |
| Smart Card Reader | None | One | One |
| Hard disk drives | <ul style="list-style-type: none"> Up to two SATA drives, 1TB maximum: 80, 250, 500 GB (7,200-rpm) Ultra320 SCSI support via X-Option card (X9265A) only. No SCSI disk drives will be sold with Sun Ultra 20 Workstation. | Up to two IDE drives, 160 GB maximum: 80GB (7200-rpm) | Up to two IDE drives, 160 GB maximum: 80GB (7200-rpm) |
| RAID 0/1 | Yes | None | None |
| FireWire/USB Ports | Two / Six | None / Four | Two / Seven |
| Audio | AC '97 | AC '97 | AC '97 |
| Parallel/Serial | None | One parallel / one serial | One parallel / one serial |
| PCI-Express slots | One full-length @ x16 Two full-length @ x1 | None | None |
| 64-bit PCI slots (66 or 33MHz) | None | Three full-length @ 66MHz Three full-length @ 33MHz | One full-length @ 66MHz Three full-length @ 33MHz |
| 32-bit PCI slots (33MHz) | One full length Three half length | None | One full-length |
| O/S Validated by Sun | <ul style="list-style-type: none"> Solaris 10 Red Hat Enterprise Linux WS v3 - 32-bit Red Hat Enterprise Linux WS v3 - 64-bit Red Hat Enterprise Linux WS v4 - 32-bit Red Hat Enterprise Linux WS v3 - 64-bit SuSE Linux Enterprise Server 9 - 32-bit SuSE Linux Enterprise Server 9 - 64-bit Windows XP Professional Windows XP Professional x64 No Windows 2000 | <ul style="list-style-type: none"> Solaris 8 (5/03) Solaris 9 (4/03 or later) | <ul style="list-style-type: none"> Solaris 8 (2/04 or later) Solaris 9 (9/04 or later) Solaris Express 11/04 for Solaris 10 |
| Height | 433.6mm (17.07 in) | 116.84mm (4.6 in) | 459.9 mm (18.1 in) |
| Width | 199.6mm (7.86 in) | 457.2mm (18 in) | 175 mm (6.9 in) |

| Features | Sun Ultra 20 Workstation | Sun Blade 150 | Sun Blade 1500 |
|-------------------------------|--------------------------|--------------------|--------------------|
| Depth | 467.45mm (18.40 in) | 447.04mm (17.6 in) | 465.1 mm (18.3 in) |
| Weight | 15.4 kg ((34.0 lbs) | 12.2 kg (26.9 lb.) | 14.8 kgs (33 lbs) |
| Power supply | 400W | 250W | 360W |
| Price Range (U.S. List Price) | \$895 to \$2,695 | \$1,395 to \$3,395 | \$3,95 to \$4,095 |

The Sun Ultra 20 Workstation complements and broaden Sun's AMD-based workstation portfolio. With respect to 1-socket workstations, whereas the Sun Java Workstation W1100z offers AGP-based graphics , IDE storage, PCI-X I/O expansion slots, and a list price starting at \$1,995 (U.S. List Price), the Sun Ultra 20 Workstation offer the higher performance with PCI-Express graphics, Serial ATA storage, PCI-Express I/O, and a list price starting at \$895 (U.S. List Price).

Comparison: Sun Ultra 20 Workstation versus Sun Java Workstation W1100z

The Sun Ultra 20 Workstation will enable customers to:

- Develop Solaris 10 applications immediately out of the box
- Be more productive by gaining the highest system performance found on a 1-socket workstation
- Save money by using un-buffered DIMMs and non-ECC memory
- Gain more flexibility by using ECC or non-ECC memory
- Visualize more complex datasets with PCI-Express graphics
- Store more data locally and retrieve them quicker by using Serial ATA HDDs
- Safeguard their data sets for mission-critical applications by utilizing RAID mirroring1
- Be more productive due to a lower system noise level (lower fan noise, intelligent noise circuitry)

The Sun Java Workstations W1100z workstation is ideal for customers who:

- Want to protect their investments in Solaris 9 applications
- Want to configure up to 8GB of memory
- Want to protect their investments in AGP-based graphics cards
- Want to protect their investments in PCI-X expansion cards
- Require modest hard drive expansion, capacity, and speed

| Features | Sun Ultra 20 Workstation | Sun Java Workstation W1100z |
|------------------------|---|--|
| Pre-Installed Software | <ul style="list-style-type: none"> • Solaris 10 • Sun Studio Creator • Sun Java Studio 11 • Sun Java Studio Enterprise • Net Beans IDE | None |
| Processor Type | AMD Opteron Processor 939-pin, 100-series Single-core and Dual-core | AMD Opteron Processor 940-pin, 100-series Single-core only |
| Number of Processor | • One | • One |

| Features | Sun Ultra 20 Workstation | Sun Java Workstation W1100z |
|---------------------------------|---|--|
| Processor Speed Grades | <ul style="list-style-type: none"> • Dual 2.4Ghz cores (Model 180) • Single 1.8GHz core (Model 144) • Single 2.2GHz core (Model 148) • Single 2.6GHz core (Model 152) • Single 2.8Ghz core (Model 154) | <ul style="list-style-type: none"> • Single 1.8Ghz core (Model 144) • Single 2.0 Ghz core (Model 146) • Single 2.2 Ghz core (Model 148) • Single 2.4 Ghz core (Model 150z) |
| Level 2 cache | 1 MB | 1 MB |
| Front Side Bus | 1 HyperTransport™ link (8 GB/s) | 1 HyperTransport™ link (6.4 GB/s per link) |
| Memory | <ul style="list-style-type: none"> • 4GB @ PC3200 • 4 DIMM slots • Un-buffered DIMMs only • ECC (1GB, 512MB) or non-ECC (256MB) | <ul style="list-style-type: none"> • 8GB @ PC3200 • 4 DIMM slots • Registered DIMMs only • ECC only |
| Graphics Accelerators | <ul style="list-style-type: none"> • ATI RageXL (on-board) • NVIDIA NVS280 PCI-Express • NVIDIA FX540 • NVIDIA FX1400 • NVIDIA FX3450 | <ul style="list-style-type: none"> • NVIDIA NVS280 AGP • NVIDIA FX500 • NVIDIA FX1100 • NVIDIA FX3000 • NVIDIA FX4000 |
| Networking | On-board 1 x Gigabit Ethernet | On-board 1x Gigabit Ethernet |
| Optical Drives | <ul style="list-style-type: none"> • DVD-ROM (Option) • DVD Dual (Option) | <ul style="list-style-type: none"> • DVD-ROM / CD-RW (Standard) • 16x Dual Layer DVD Recorder (Option) |
| Floppy Disk Drive | • None | • None |
| Smart Card Reader | • None | • None |
| Hard disk drives | <ul style="list-style-type: none"> • Up to two SATA drives, 500GB maximum: 80, 250GB (7,200 rpm) • Ultra320 SCSI support via X-Option card (X9265A) only. No SCSI disk drives will be sold with Sun Ultra 20 Workstation. | <ul style="list-style-type: none"> • No SATA drives • Up to two 80GB (7,200 rpm) IDE drives, 160GB maximum |
| RAID 0/1 | Yes | No |
| FireWire/USB Ports | Two / Six | Two /Six |
| Audio | AC '97 | AC '97 |
| Parallel/Serial | None | One parallel / Two serial |
| PCI-Express slots | One full-length @ x16 Two full-length @ x1 | None |
| PCI-X 1.0 slots (100 or 133MHz) | None | One half-length @ 133 Mhz One half-length @ 100 Mhz Three full-length @ 100 Mhz |
| 64-bit PCI slots (66 or 33MHz) | None | None |
| 32-bit PCI slots (33MHz) | One full-length Three half-length | None |

| Features | Sun Ultra 20 Workstation | Sun Java Workstation W1100z |
|-------------------------------|---|--|
| O/S Validated by Sun | <ul style="list-style-type: none"> • Solaris 10 • Red Hat Enterprise Linux WS v3 – 32-bit • Red Hat Enterprise Linux WS v3 – 64-bit • Red Hat Enterprise Linux WS v4 – 32-bit • Red Hat Enterprise Linux WS v3 – 64-bit • SuSE Linux Enterprise Server 9 – 32-bit • SuSE Linux Enterprise Server 9 – 64-bit • Windows XP Professional • Windows XP Professional x64 • No Windows 2000 | <ul style="list-style-type: none"> • Solaris 10 • Solaris 9 • Red Hat Enterprise Linux WS v3 – 32-bit • Red Hat Enterprise Linux WS v3 – 64-bit • SuSE Linux Enterprise Server 9 – 32-bit • SuSE Linux Enterprise Server 9 – 64-bit • Windows XP Professional |
| Height | 433.6mm (17.07 in) | 462 mm (18.2 inches) |
| Width | 199.6mm (7.86 in) | 200 mm (7.9 inches) |
| Depth | 467.45mm (18.40 in) | 557 mm (21.9 inches) |
| Weight | 15.4 kg (34.0 lbs) fully configured | 24 kg (53 lbs) fully configured |
| Power supply | 400W | 550W |
| Price Range (U.S. List Price) | \$895 to \$2,695 | \$1,795 to \$2,495 |

2.0 Key Highlights

With the introduction of the Sun Ultra 20 Workstation, Sun offers one of the most compelling 1-socket workstation available. The Sun Ultra 20 Workstation provides high performance with new 64-bit x64 applications and with existing 32-bit x64 applications. With support for multiple 32-bit and 64-bit operating systems, Sun Ultra 20 Workstation offers the flexibility customers need in order to run their choice of applications using the same hardware architecture, while minimizing hardware support costs and reducing IT training costs. Coupled with competitive pricing, a one-year base warranty, and next-business-day support, the Sun Ultra 20 Workstation offers among the best total costs of ownership (TCO) on workstations.

Performance

- **PCI-Express Graphics.** The Sun Ultra 20 Workstation will be the first-ever workstation from Sun utilizing PCI-Express graphics. PCI-Express is the best input/output implementation update in a decade. Effectively replacing PCI, PCI-X and AGP, this third-generation I/O interconnect standard doubles the bandwidth of AGP 8x.
- **High-Density, High-Performance, Reliable Internal Storage.** The Sun Ultra 20 Workstation will be the first 1-socket workstation from Sun to reach one terabyte of internal storage. Utilizing Serial ATA for density, the Sun Ultra 20 Workstation can accommodate up to two internal 500GB drives for a capacity of 1TB. Utilizing RAID 0 for high-performance, the Sun Ultra 20 Workstation delivers very high transfer rate. Utilizing RAID 1 for redundancy, the Sun Ultra 20 Workstation safeguards data for mission-critical application.
- **High-performance, high-throughput 1-socket workstation.** The Sun Ultra 20 Workstation are among the highest-performance 1-socket workstations for both 64-bit and 32-bit applications. To provide such high levels of performance, Sun Ultra 20 Workstation is built with a robust set of workstation features, including:
 - Support for one dual-core or single-core AMD Opteron processor with HyperTransport technology and an integrated 128-bit memory controller
 - Support for up to 4GB of unbuffered memory with optional ECC
 - High bandwidth memory subsystem with error correction
 - Gigabit Ethernet
 - Two PCI-Express x1 expansion slots that enable high-speed expansion, such as Ultra320 SCSI, additional Gigabit Ethernet adapters, etc.
 - Expandable, high-performance storage options
- **World-class benchmarks.** The Sun Ultra 20 Workstation intends to demonstrate world-class benchmarks on SPECintRate2000, SPECfpRate2000, SPECviewperf, Stream (memory bandwidth), as well as EDA, MCAD benchmarks.

Value

- **Pre-Installed Operating Systems and Development Tools:** Every Sun Ultra 20 Workstation is shipped with the Solaris 10 Operating Systems and a full suite of development tools. Developers can conveniently start a software project immediately by utilizing Sun Studio Creator, Sun Java Studio, Sun Java Studio Enterprise, and Net Beans IDE. These tools will help developers create and deploy Solaris and Java applications in less time.
- **Competitive pricing.** Sun Ultra 20 Workstation will be offered at a starting list price of \$895 (U.S. List price). The Sun Ultra 20 Workstation competes head-to-head with any Pentium 4 workstations. With price points similar to the mini-tower Pentium 4 workstations, as well as high performance 32-bit x64 capability, Sun Ultra 20 Workstation can replace any such Pentium 4-based workstations.
- **Compatibility/ISV Certification.** Sun maintains strategic partnerships with leading workstation Independent Software Vendors (ISVs) to certify Sun Ultra 20 Workstation for compatibility. Through rigorous validation, Sun helps ensure flawless compatibility in the most complex and technically demanding computing environments. Sun Ultra 20 Workstation have been tuned for optimal performance with each application and deliver a best-in-class price-performance ratio for commodity 64-bit workstations in their class.
- **Investment protection.** By using the same architecture to run 32-bit and 64-bit operating systems and applications, Sun

Ultra 20 Workstation helps customers protect their investments in 32-bit operating systems/applications, while giving them a simplified migration path to 64-bit operating systems/applications. With Sun Ultra 20 Workstation, customers can take advantage of today's improved 32-bit performance enhancements and protect their 32-bit investments while retaining the ability to upgrade to 64-bit operating systems and applications as needed.

- **World-Class Services.** Sun Ultra 20 Workstation are supported by the world-class Sun Services organization, which provides a wide range of services to help customers reduce cost and complexity, accelerate network deployment, and deliver mobility with security—all from a single source.

Flexibility

- **Support for multiple operating systems.** The Sun Ultra 20 Workstation prove their high flexibility by providing support for multiple operating systems, including Solaris 10 , Red Hat Enterprise Linux WS 3 and 4, SuSE Linux Enterprise Server, and Windows XP Professional. Customers can purchase either Solaris or Linux operating systems from Sun and obtain complete system support from Sun. For customers who deploy Windows XP Professional, Windows XP Professional x64, the Sun Ultra 20 Workstation has been certified by Microsoft and Sun does provide support for Windows XP Professional operating systems.
- **Multiple graphics options.** The Sun Ultra 20 Workstation support a wide variety of PCI-Express workstation-class graphics accelerators from NVIDIA. The multiple graphics options of the Sun Ultra 20 Workstation allow customers to achieve the next level of creativity with OpenGL high-performance graphics and support for multiple displays and visualization software.

Innovation

- **Latest processor technology.** The Sun Ultra 20 Workstation is 2nd Sun workstation to feature the dual-core or single-core AMD Opteron processor with HyperTransport technology and an integrated memory controller, enabling true 64-bit computing on an x64 architecture. HyperTransport technology delivers exceptional bandwidth, alleviating the constraints that typically limit performance.
- **Robust and Compact Design.** The Sun Ultra 20 Workstation features a mini-tower form factor along with six USB 2.0 ports, two IEEE 1394a (FireWire) ports, one built-in Gigabit Ethernet port, and multiple PCI-Express slots.
- **ECC technologies.** The Sun Ultra 20 Workstation utilizes ECC memory technologies. ECC detects errors and corrects memory errors before they spread, helping to ensure the integrity of the data stored in memory.

3.0 Target Markets and Customers

The Sun Ultra 20 Workstation is targeted at customers in Fortune 1000 companies who:

- Are evaluating Pentium 4-based workstations for memory-intensive, I/O-bound applications or performance-bound applications OR
- Are looking for an easy migration to 64-bit computing OR
- Require PCI-Express class graphics OR
- Are open to the best solution (not bound by Intel solutions)

With respect to workloads, the Sun Ultra 20 Workstation is target at users who

- Develop software (Java programming, 64-bit porting, Solaris 10 applications development)
- Design, simulate and verify ASICs or microprocessors (EDA)
- Design automobiles, aircrafts, and other mechanical structures (MCAD)

Tables 3-1 and 3-2 show the target markets, target customers, and target customer needs for the Sun Ultra 20 Workstation

Table 3-1: Target Markets and Customers of Sun Ultra 20 Workstation

| Sun Ultra 20 Workstation Target Markets | Sun Ultra 20 Workstation Target Customers | Sun Ultra 20 Workstation Target Customer Needs |
|---|---|---|
| SW Developer | <ul style="list-style-type: none"> • Software developers who develop and test commercial applications and datasets | <ul style="list-style-type: none"> • Flexible, low-cost development platform that supports 32-bit and 64-bit computing environments • Support for multiple operating systems. Eliminate issues associated with transitioning software applications and datasets |
| Semiconductor manufacturers Motherboard manufacturers PCB manufacturers | <ul style="list-style-type: none"> • Electronic engineers who design and layout PCBs • Electronic engineers who design and verify complex ASICs | <ul style="list-style-type: none"> • High-performance Processors • Entry-level professional 3D graphics • Large memory capacity • Low cost |
| Automobile Aerospace Heavy machinery | <ul style="list-style-type: none"> • Mechanical engineers who design automobiles and aircraft and simulate crash tests of automobiles and aircraft | <ul style="list-style-type: none"> • Large amounts a memory • Increased I/O bandwidth |

4.0 Sun Ultra 20 Workstation Features

Features, Functions, and Benefits

Table 4-2 describes the main features, functions, and benefits offered by the Sun Ultra 20 Workstation.

Table 4-2: Features, Functions, and Benefits of Sun Ultra 20 Workstation

| Feature | Function | Benefit |
|---|---|--|
| One dual-core or single-core AMD Opteron Processor (939-pin,100-series) | Delivers simultaneous 32-bit and 64-bit enterprise-class computing for increased scalability of systems and applications without requiring dramatic instruction-set changes and recompilation. | Provides high performance while ensuring investment protection. |
| AMD HyperTransport technology and 128-bit wide DDR memory controller. | HyperTransport provides a high-speed connection between processors and core logic while the integrated memory controller reduces latency by pooling memory resources into a single coherent space, alleviating Processor bandwidth constraints that typically limit performance in other x64 architectures. | Increases performance and productivity. |
| Support unbuffered DDR-400 DIMMs - Up to 4 GB of ECC DIMMs - Up to 1GB of non-ECC DIMMs | Provides flexible memory configuration to support a variety of applications and computing tasks. | Increases performance and productivity. |
| Chipkill memory support | Allows a single DRAM chip to fail (not the DIMM just a chip on the DIMM) and the system will continue to run. | Increases memory reliability, reduces downtime, and allows DIMM replacement to occur at regularly-scheduled service intervals. |
| Flexible graphics accelerator options. | Gives customers a choice of four graphics accelerators ranging from 2D to high-performance 3D, and provides the capability to visualize, analyze, and solve the most complex data sets. | Enables customers to choose the graphics card that suits their needs. |
| PCI-Express I/O architecture | Provides three PCI-Express expansion slots | Offers efficient I/O utilization for I/O-bound applications. |
| Support for up to 500GB of Serial ATA | Enables fast access to internal storage. | Increased application performance and disk swapping flexibility. |
| Support for RAID 0 (on Windows XP Professional and Windows XP Professional x64 only) | Large datasets are divided in blocks that get written across all the two or more drives in the array | Datasets are recalled across two or more drives resulting in I/O performance higher than a single disk. |
| Support for RAID 1 (on Windows XP Professional and Windows XP Professional x64 only) | Mission critical datasets are stored twice on a mirror disk. | System uses mirror drive for data recovery and continues operation, even if the disk fails |
| Rich connectivity suite. | Offers six USB 2.0 ports, 2 FireWire ports, and 1 Gigabit Ethernet port that enable convenient connections to peripheral devices. | Provides a flexible platform to meet changing business requirements. |
| Solaris 10 Operating System | Runs Solaris x64 applications | Enables customers to run popular applications on one of the most robust, reliable operating systems available. |
| Rich suite of pre-installed Sun Software Development Tools | Sun Studio Java Studio Creator Java Studio Enterprise Net Beans IDE | Enables SW developers to start programming right out of the box |
| Qualification to run 32-bit and 64-bit standard Linux distributions. | Enables Sun Ultra 20 Workstation to run popular, off-the-shelf, standard Linux distributions and Linux packages from the top Linux vendors and Linux ISVs. | Gives customers the flexibility to choose which operating system best suits their needs. |

| Feature | Function | Benefit |
|--|---|---|
| Windows XP Professional certified. | Enables Sun Ultra 20 Workstation to run Windows operating systems and applications. | Gives customers the flexibility to choose which operating system best suits their needs. |
| Three year, next business day warranty. | Provides a robust and competitive service offering for warranty-level support | Peace of mind to customers knowing Sun Ultra 20 Workstation is covered by a legendary global services organization. |
| Same business day and 7x24 hardware support options. | Competitively priced, industry-standard hardware service and support options to meet the customer's service and system availability requirements. | Allows customers to choose which option best suits their needs and helps protect their investments in Sun hardware. |

5.0 System Architecture

External Connectivity Ports

The Sun Ultra 20 Workstation contains a rich suite of connectivity ports, as shown in Table 5-1. Most ports are conveniently located in the front and the back, providing easy access to peripherals, connectors, and visual indicators.

Table 5-1: Sun Ultra 20 Workstation I/O ports

| Port Type | Front | Back |
|-----------------------|-------|------|
| USB 2.0 | 2 | 4 |
| FireWire (IEEE 1394a) | 2 | 0 |
| Gigabit Ethernet | 0 | 1 |
| Audio | 2 | 3 |
| Parallel | 0 | 0 |
| Serial | 0 | 0 |

Figure 5-1 shows the front view of Sun Ultra 20 Workstation. The tray-loading DVD-ROM (standard configuration) or the DVD Recorder (ATO) always occupies the first external drive bay. The LED shows the activity of the system and will light up on any BIOS hardware error, including memory errors, POST errors (h/w), machine check exceptions, Processor overheating, fan speed failure, and other errors. The LED in the front panel provides only limited information—the PC Check diagnostic utility included with the Sun Ultra 20 Workstation should be used to gain detailed information about the system.

Rounding out the front panel, the Sun Ultra 20 Workstation provides convenient attachment to external portable hard drives or video cameras via two USB 2.0 connectors and two IEEE 1394a (FireWire) connector. Additionally, an input for a microphone and an output for headphones are also included. The remaining complementary connectors are provided in the rear panel.



Figure 5-1: Front view of Sun Ultra 20 Workstation.

Figure 5-2 shows the rear view of Sun Ultra 20 Workstation. It contains the remaining USB ports and the audio ports introduced earlier. Starting from the top of the chassis, Sun Ultra 20 Workstation provides the VGA connector for the on-board Rage XL PCI graphics controller, followed by the remaining audio connectors (audio out, audio in, microphone in). Next, one RJ-45 port is stacked above two USB 2.0 ports and the final USB 2.0 ports.



Figure 5-2: Sun Ultra 20 Workstation—Rear View

Expansion Slots

The Sun Ultra 20 Workstation each have seven (7) expansion slots, the most of any P4-based workstations in its class:

- One PCI-Express x16 slot (reserved for graphics accelerator)
- Two PCI-Express x1 slots
- Four conventional PCI slots (32-bit, 33Mhz)

The PCI-Express x16 slot is reserved for the graphics card. The Sun Ultra 20 Workstation will be available without a graphics card installed. If a graphics card is not inserted into the PCI-Express x16 slot of the Sun Ultra 20 Workstation, the on-board ATI RageXL PCI graphics controller will serve as the graphics controller. When a graphics card is installed, the ATI RageXL graphics controller will become inactive. PCI-Express x1 slots and Conventional PCI slot can be used for optional cards such as Gigabit Ethernet, Ultra320 SCSI Adapter. Table 5-2 explains the layout of the expansion slots.

Table 5-2: Sun Ultra 20 Workstation Expansion Slot Layout

| Slot | Connector Type | Length | Height | Description |
|------|---|--------|--------|---|
| 1 | PCI-Express x16 | Full | Full | Reserved for graphics accelerator (nearest to power supply) |
| 2 | Conventional PCI (PCI v3.2 32-bit/33Mhz, 3.3V/5V) | Half | Full | Open slot |
| 3 | Conventional PCI (PCI v3.2 32-bit/33Mhz, 3.3V/5V) | Half | Full | Open slot |
| 4 | Conventional PCI (PCI v3.2 32-bit/33Mhz, 3.3V/5V) | Half | Full | Open slot |

| Slot | Connector Type | Length | Height | Description |
|------|---|--------|--------|--|
| 5 | Conventional PCI (PCI v3.2 32-bit/33Mhz, 3.3V/5V) | Full | Full | Open slot |
| 6 | PCI-Express x1 | Full | Full | Open slot |
| 7 | PCI-Express x1 | Full | Full | Open slot (farthest from power supply) |

The AMD Opteron Processor

The Sun Ultra 20 Workstation is powered by the dual-core or single-core Socket-939 version of the AMD Opteron 100-series processor, which enables lower system cost while providing simultaneous 32-bit and 64-bit computing. The AMD Opteron processor is designed to run existing 32-bit applications with outstanding performance and offers customers a simplified migration path to 64-bit computing. This revolutionary processor provides a dramatic increase in compatibility, performance, and investment protection. Table 5-3 shows the AMD Opteron processor features and benefits.

Table 5-3: AMD Opteron Processor Features and Benefits

| Feature | Benefit |
|---|--|
| Simultaneous 32-bit and 64-bit computing capabilities. | Allows users to run 32-bit and/or 64-bit applications and operating systems without sacrificing performance. |
| One HyperTransport link, with up to 8GB/s peak bandwidth. | Provides substantial I/O bandwidth for current and future application needs. |
| 256 Terabytes of memory address space. | Creates a significant performance benefit for applications in which large (or multiple) datasets are held in memory. |
| Integrated 128-bit memory controller | Yields fast computational processing for increased performance and productivity. |

Chipset

The NVIDIA nForce4 Ultra chipset provides HyperTransport-to-PCI-Express bridging interface well as the following functionality.

- HyperTransport™ interface to AMD Opteron Processor
- PCI Express x16 interface
- PCI Express x1 interface
- 10/100/1000BASE-T Ethernet
- Serial ATA 1.5GBps controller
- EIDE Controller, supporting up to ATA-133
- AC'97 Audio
- USB 2.0
- I/O buses: PCI, LPC, SMBus, and APIC

Memory

Previously available only in high-performance 64-bit processors such as the Sun UltraSPARC IIIi, the AMD Opteron processor incorporates an integrated memory controller and improves the way typical x64 processors access main memory, resulting in increased bandwidth, reduced memory latencies, and increased processor performance.

The 128-bit wide integrated DDR DRAM memory controller is capable of yielding a memory bandwidth of 6.4 GB/s and supports up to four unbuffered DDR DIMMs. The Sun Ultra 20 Workstation can reach up to a maximum of 4GB using its 4 DIMM slots. The Sun Ultra 20 Workstation supports 1GB ECC DIMMs, 512MB ECC DIMMs, and 256MB non-ECC DIMMs. DIMMs are available only in pairs and must be installed as identically matched pairs. Table 5-4 explains the memory upgrade paths for the Sun Ultra 20 Workstation

Table 5-4: Memory Upgrade Paths for the Sun Ultra 20 Workstation

| From | To | Actions | Remaining DIMM Sockets |
|---|-------|--|--|
| Sun Ultra 20 Workstation w/ 512MB (2x 256MB DIMMs) | 1GB | <ul style="list-style-type: none"> Leave in existing two 256MB DIMMs Install two 256MB DIMMs | <ul style="list-style-type: none"> Zero DIMM sockets remaining |
| | 1.5GB | <ul style="list-style-type: none"> Leave in existing two 256MB DIMMs Install two 512MB DIMMs | <ul style="list-style-type: none"> Zero DIMM sockets remaining |
| | 2GB | <ul style="list-style-type: none"> Remove existing two 256MB DIMMs Install four 512MB DIMMs or two 1GB DIMMs | <ul style="list-style-type: none"> Zero DIMM sockets remaining if using four 512MB DIMMs Two DIMM sockets remaining if using two 1GB DIMMs |
| | 2.5GB | <ul style="list-style-type: none"> Leave in existing two 256MB DIMM Install two 1GB DIMMs | <ul style="list-style-type: none"> Zero DIMM sockets remaining |
| | 3GB | <ul style="list-style-type: none"> Remove existing two 256MB DIMMs Install two 1GB DIMMs and two 512MB DIMMs | <ul style="list-style-type: none"> Zero DIMM sockets remaining |
| | 4GB | <ul style="list-style-type: none"> Remove existing two 256MB DIMMs Install four 1GB DIMMs | <ul style="list-style-type: none"> Zero DIMM sockets remaining |
| Sun Ultra 20 Workstation w/ 1GB (2x 512MB DIMMs) | 1.5GB | <ul style="list-style-type: none"> Leave in existing two 512MB DIMMs Install two 256MB DIMMs | <ul style="list-style-type: none"> Zero DIMM sockets remaining |
| | 2GB | <ul style="list-style-type: none"> Leave in existing two 512MB DIMMs Install two 512MB DIMMs | <ul style="list-style-type: none"> Zero DIMM sockets remaining |
| | 3GB | <ul style="list-style-type: none"> Leave in existing two 512MB DIMMs Install two 1GB DIMMs | <ul style="list-style-type: none"> Zero DIMM sockets remaining |
| | 4GB | <ul style="list-style-type: none"> Remove existing two 512MB DIMMs Install two 2GB DIMMs or four 1GB DIMMs | <ul style="list-style-type: none"> Zero DIMM sockets remaining if using four 1GB DIMMs Two DIMM sockets remaining if using two 2GB DIMMs |
| Sun Ultra 20 Workstation w/ 2GB (2x 1GB DIMMs) | 3GB | <ul style="list-style-type: none"> Leave in existing two 1GB DIMMs Install two 512MB DIMMs | <ul style="list-style-type: none"> Zero DIMM sockets remaining |
| | 4GB | <ul style="list-style-type: none"> Leave in existing two 1GB DIMMs Install two 1GB DIMMs | <ul style="list-style-type: none"> Zero DIMM sockets remaining |

NOTE: The DIMMs used in the Sun Ultra 20 Workstation have gone through extensive testing and qualification before being added to Sun's approved vendor list. Note that not all vendors perform equally, and some third-party memory vendors do not provide the reliability and quality Sun customers expect. Sun recommends that customers use only Sun-qualified memory for maximum reliability.

Expansion Bays

The Sun Ultra 20 Workstation each have three expansion bays: one external and two internal. The external bay is always occupied by either the DVD Dual drive or the DVD-ROM drive. Table 5-6 describes the different expansion bays.

Table 5-6: Sun Ultra 20 Workstation Workstation Expansion Bays

| Bay | Type | Size | Description |
|-------|----------|-----------|--|
| Bay 1 | External | 5.25-inch | Occupied by DVD-Dual or DVD-ROM |
| Bay 2 | Internal | 3.5-inch | Occupied by 80GB or 250GB SATA hard disk drive |
| Bay 3 | Internal | 3.5-inch | Occupied by 80GB or 250GB SATA hard disk drive |

Storage

Serial ATA is the primary method of storage for the Sun Ultra 20 Workstation. The Sun Ultra 20 Workstation is available in standard configuration with SATA drives only and the option to add one more SATA drive for a maximum of two drives.

Sun Ultra 20 Workstation will be available with SATA RAID 0 and RAID 1 at GA under Windows, Red Hat Linux and SuSE Linux Enterprise Server 9 only.

Sun Ultra 20 Workstation will not be sold with SCSI hard disk drives, in standard configurations, ATO, or X-Option. However, Sun will validate an Ultra320 SCSI adapter (X9265A) and will make it available for purchase via X-Option only (ATO not available). Customers may attach their preferred SCSI disk drives to X9265A.

6.0 Operating Systems

Sun Ultra 20 Workstation Systems Support

The Sun Ultra 20 Workstation is a 64-bit workstation that offer the widest available range of operating systems support—more than other workstations offered by Sun's competitors. The Sun Ultra 20 Workstation support multiple 32-bit and 64-bit operating systems, including Linux and Solaris. Sun Ultra 20 Workstation will also be listed in the Windows Catalog as being fully certified for the Windows XP Professional and Windows XP Professional x64. Table 6-1 shows the operating systems supported on the Sun Ultra 20 Workstation.

Table 6-1: Supported Operating Systems on the Sun Ultra 20 Workstation

| Operating System | Certified | Pre-installed Option at the Factory? | Sold by Sun? | Supported by Sun |
|---|-----------|--------------------------------------|--------------|------------------|
| Solaris 10 | Yes | Yes | Yes | Yes |
| Red Hat Enterprise Linux 3.0 WS v3 (32-bit) | Yes | No | Yes | Yes |
| Red Hat Enterprise Linux 3.0 WS v3 (64-bit) | Yes | No | Yes | Yes |
| Red Hat Enterprise Linux 3.0 WS v4 (32-bit) | Yes | No | Yes | Yes |
| Red Hat Enterprise Linux 3.0 WS v4 (64-bit) | Yes | No | Yes | Yes |
| SuSE Linux Enterprise Server 9 (32-bit) | Yes | No | No | Yes |
| SuSE Linux Enterprise Server 9 (64-bit) | Yes | No | No | Yes |
| MS Windows XP Professional | Yes | No | No | Yes |
| MS Windows XP Professional – x64 Edition | Yes | No | No | Yes |

All Red Hat Enterprise Linux OS's, SuSE Linux Enterprise Server OS's, and Solaris 10 can be ordered from Sun. Support contracts are also available for these operating systems.

*** The Sun Ultra 20 Workstation will also be listed in the Windows Catalog as being fully certified for the Windows XP Professional and Windows XP Professional x64. It has earned the "Compatible with Windows" designation as a certified platform to run the Microsoft Windows XP Professional and Windows XP Professional x64 Operating system. Sun Ultra 20 Workstation will be listed on the Microsoft Hardware Compatibility List (HCL) which can be seen by visiting the Microsoft Windows Hardware and Driver Central (WHDC) at <http://www.microsoft.com/whdc/hcl/search.mspc>. While qualified to run the Microsoft Windows XP Professional operating systems, these operating systems are not available from Sun for either purchase. However, Sun does support the Windows XP Professional operating systems.

7.0 Supported Graphics Accelerators

The Sun Ultra 20 Workstation supports four graphics accelerators

- ATI RageXL PCI on-board graphics controller (does not carry ISV certification)
- NVIDIA Quadro NVS280 PCI-Express card (carries full ISV certification)
- NVIDIA Quadro FX540 card (carries full ISV certification)
- NVIDIA Quadro FX1400 card (carries full ISV certification)
- NVIDIA Quadro FX3450 card (carries full ISV certification)

ATI RageXL PCI On-Board Graphics Controller

The on-board ATI® RageXL PCI graphics controller provides Sun customers a basic set of graphics functionality suitable for SW Development or Education. This chip addresses up to 8 MB of 64-bit wide memory and can drive any one Sun display. The ATI RageXL cannot drive two displays. The on-board RageXL can drive a one display even without a graphics card installed. When a graphics card is installed, the ATI RageXL PCI graphics controller will be disabled.

Table 7-1 summarizes key specifications and features of the on-board ATI® RageXL PCI Graphics Controller

| | |
|---|---|
| Form Factor | Soldered down on motherboard |
| Bus Type | Conventional PCI |
| Memory | 8MB of SDRAM (64-bit interface) |
| Connector | One DB-15 VGA connector |
| Single DVI Support | • No |
| Dual DVI Support | • No |
| Maximum Resolution | <ul style="list-style-type: none"> • Sun 24.1-inch LCD: 1600 x 1200 • Sun 22-inch flat screen AG CRT: 1600 x 1200 • Sun 19-inch LCD: 1280 x 1024 • Sun 17-inch Sun color CRT: 1280 x 1024 |
| Max Display Supported | One |
| Max Boards Per Sun Ultra 20 Workstation | Not Applicable |
| Standard Configuration | Yes |
| ATO | Yes |
| X-Option | Not Applicable |
| Available Drivers | • Solaris 10, Windows XP Professional, Windows XP Professional x64, Red Hat Enterprise Linux WS v3 (32-bit and 64-bit), Red Hat Enterprise Linux WS v4 (32-bit and 64-bit), SuSE Linux Enterprise Server 9 |

NVIDIA Quadro NVS280 PCI-Express Graphics Accelerator

The NVIDIA® Quadro® NVS 280 (PCI-Express version) graphics accelerator provides Sun customers a very cost-effective 2D board for SW Development or EDA. This card ships with 64 MB of DDR memory and can drive up to two Sun 17-inch Color Monitors, two Sun 22-inch CRTs, or two Sun 19-inch TFT LCD Monitors. Sun Ultra 20 Workstation supports one NVS280 graphics



accelerator

Table 7-2 summarizes key specifications and features of the NVIDIA Quadro NVS 280 (PCI-Express) .

| | |
|---|--|
| Form Factor | Half-height |
| Bus Type | PCI Express x16 |
| Memory | 64MB of DDR SDRAM (64-bit interface) |
| Connector | One high-density connector (DMS-59) to support dual DVI-I |
| Single DVI Support | • Yes |
| Dual DVI Support | • Yes |
| Maximum Resolution | Sun 19-inch Sun TFT flat panel LCD: 1600 × 1200 Sun 22-inch flat screen AG CRT: 2048 x 1536 • Sun 19-inch LCD: 1280 x 1024 • Sun 17-inch Sun color CRT: 1280 x 1024 |
| Max Display Supported | Two |
| Max Boards Per Sun Ultra 20 Workstation | One |
| Standard Configuration | Yes |
| ATO | Yes |
| X-Option | Yes |
| Available Drivers | • Solaris 10, Windows XP Professional, Windows XP Professional x64, Red Hat Enterprise Linux WS v3 (32-bit and 64-bit), Red Hat Enterprise Linux WS v4 (32-bit and 64-bit), SuSE Linux Enterprise Server 9 |

NVIDIA Quadro FX540 PCI-Express Graphics Accelerator



The NVIDIA® Quadro™ FX 540 graphics accelerator provides Sun customers an entry-level 3D performance workstation graphics solution for SW development or everyday MCAD applications. This card ships with 128MB of DDR memory and can drive one Sun LCD display and one analog display. When the NVIDIA Quadro FX 540 a graphics card is installed, the ATI RageXL PCI graphics controller will be disabled.

Table 7-3 summarizes key specifications and features of the NVIDIA Quadro FX 540 (PCI-Express) .

| | |
|---|--|
| Form Factor | Full-height |
| Bus Type | PCI Express x16 |
| Memory | 128MB of DDR SDRAM (256-bit interface) |
| Connector | <ul style="list-style-type: none"> • DVI-I 1.0 (Single Link) • VGA • HDTV out 9-pin mini-DIN |
| Single DVI Support | • Yes |
| Dual DVI Support | • Yes |
| Maximum Resolution | <ul style="list-style-type: none"> • Sun 24.1-inch LCD: 1920 × 1200 • Sun 19-inch Sun TFT flat panel LCD: 1600 × 1200 × 32 bpp at 60 Hz • Sun 22-inch flat screen AG CRT: 2048 x 1536 • Sun 17-inch Sun color CRT: 1280 x 1024 |
| Max Display Supported | Two |
| Max Boards Per Sun Ultra 20 Workstation | One |
| Standard Configuration | No |
| ATO | Yes |
| X-Option | Yes |
| Available Drivers | <ul style="list-style-type: none"> • Solaris 10, Windows XP Professional, Windows XP Professional x64, Red Hat Enterprise Linux WS v3 (32-bit and 64-bit), Red Hat Enterprise Linux WS v4 (32-bit and 64-bit), SuSE Linux Enterprise Server 9 |

NVIDIA Quadro FX1400 PCI-Express Graphics Accelerator



The NVIDIA® Quadro® FX 1400 graphics accelerator provides Sun customers a mid-range 3D performance workstation graphics solution for professional MCAD applications. This card ships with 128MB of DDR memory and can drive any two Sun displays, including two 24.1-inch LCD monitors. When the NVIDIA Quadro FX 1400 a graphics card is installed, the ATI RageXL PCI graphics controller will be disabled.

Table 7-3 summarizes key specifications and features of the NVIDIA Quadro FX 1400 (PCI-Express) .

| | |
|---|--|
| Form Factor | Full-height |
| Bus Type | PCI Express x16 |
| Memory | 128MB of DDR SDRAM (256-bit interface) |
| Connector | <ul style="list-style-type: none"> • DVI-I 1.0 (Single Link) • DVI-I 1.0 (Single Link) • 3-pin mini-din stereo connector |
| Single DVI Support | • Yes |
| Dual DVI Support | • Yes |
| Maximum Resolution | <ul style="list-style-type: none"> • Sun 24.1-inch LCD: 1920 × 1200 • Sun 19-inch Sun TFT flat panel LCD: 1600 × 1200 × 32 bpp at 60 Hz • Sun 22-inch flat screen AG CRT: 2048 x 1536 • Sun 17-inch Sun color CRT: 1280 x 1024 |
| Max Display Supported | Two |
| Max Boards Per Sun Ultra 20 Workstation | One |
| Standard Configuration | Yes |
| ATO | Yes |
| X-Option | Yes |
| Available Drivers | <ul style="list-style-type: none"> • Solaris 10, Windows XP Professional, Windows XP Professional x64, Red Hat Enterprise Linux WS v3 (32-bit and 64-bit), Red Hat Enterprise Linux WS v4 (32-bit and 64-bit), SuSE Linux Enterprise Server 9 |

NVIDIA Quadro FX3450 PCI-Express Graphics Accelerator



The NVIDIA® Quadro™ FX 3450 graphics accelerator provides Sun customers a high-end 3D performance workstation graphics solution for professional MCAD. This card ships with 256MB of DDR memory and can drive any two Sun displays, including two 24.1-inch LCD monitors. When the NVIDIA Quadro FX 3450 a graphics card is installed, the ATI RageXL PCI graphics controller will be disabled.

Table 7-4 summarizes key specifications and features of the NVIDIA Quadro FX 3450 (PCI-Express) .

| | |
|---|--|
| Form Factor | Full-height |
| Bus Type | PCI Express x16 |
| Memory | 256MB of DDR SDRAM (256-bit interface) |
| Connector | <ul style="list-style-type: none"> • DVI-I Single Link Connector • DVI-I Dual Link Connector • 3-pin mini-din stereo connector |
| Single DVI Support | • Yes |
| Dual DVI Support | • Yes |
| Maximum Resolution | <ul style="list-style-type: none"> • Sun 24.1-inch LCD: 1920 × 1200 • Sun 19-inch Sun TFT flat panel LCD: 1600 × 1200 × 32 bpp at 60 Hz • Sun 22-inch flat screen AG CRT: 2048 x 1536 • Sun 17-inch Sun color CRT: 1280 x 1024 |
| Max Display Supported | Two |
| Max Boards Per Sun Ultra 20 Workstation | One |
| Standard Configuration | Yes |
| ATO | Yes |
| X-Option | Yes |
| Available Drivers | <ul style="list-style-type: none"> • Solaris 10, Windows XP Professional, Windows XP Professional x64, Red Hat Enterprise Linux WS v3 (32-bit and 64-bit), Red Hat Enterprise Linux WS v4 (32-bit and 64-bit), SuSE Linux Enterprise Server 9 |

8.0 Environment and Regulations

Environment

The Sun Ultra 20 Workstation plan to meet or exceed the following environmental specifications.

Table 8-1: Environmental Specifications Met by Sun Ultra 20 Workstation

| | Sun Ultra 20 Workstation |
|--------------------------|--|
| AC Power | 100-120; 220-240 V AC, 47-63 Hz. Maximum 0.875 KVA |
| Operating | 5° C to 35° C (41° F to 95° F); 20% to 93% relative humidity, non-condensing |
| Non-operating | -40° C to 65° C (-40° F to 158° F); 93% relative humidity, non-condensing |
| Operating Acoustic Noise | 4.3B |
| Idling Acoustic Noise | 4.7B |

Regulations

The Sun Ultra 20 Workstation plan to meet or exceed the following regulations.

Table 8-2: Regulations Met by Sun Ultra 20 Workstation

| | Sun Ultra 20 Workstation |
|---------------------|---|
| Safety | UL/CSA-60950, EN 60950, IEC 60950 CB |
| Ergonomics | EK1-1TB-2000 |
| RFI/EMC | EN 55022/CISPR22 Class B, FCC CFR47 Part 15 Class B; EN 6100-3-2, EN 61000-3-3 |
| Immunity | EN 55024 |
| Regulatory Markings | UL/cUL, TUV-GS, CE FCC, ICES-003, C-Tiek, VCCI, GOST-R, BSMI CCC, S-Mark |

9.0 Ordering and Availability

Sun Ultra 20 Workstation Standard Configurations

The following are part numbers and descriptions for the Sun Ultra 20 Workstation factory standard configurations.

Table 9-1: Sun Ultra 20 Workstation Standard Configurations

| Part Number | Description |
|--------------------|--|
| A63-LJZ1-AD-2GB-GE | RoHS-compliant Dual Core 2.4GHz/1MB (Opteron Model 180) Processor, NVIDIA Quadro FX1400 Graphics Accelerator, 2GB unbuffered ECC PC3200 (DDR-400) Memory (2 * 1GB ECC DIMM), 250-GB 7200rpm Serial ATA 1.5Gbps Hard Disk, 1 * DVD-Dual, 1 * 10/100/1000 BaseT Ethernet port, 6 * USB 2.0 ports, 2 * IEEE1394a ports, 1 * PCI-Express x16 slot, 2 * PCI-Express x1 slots, 4 * Conventional PCI slot |
| A63-LGB1-AD-2GB-GE | <u>NOT RoHS-compliant</u> Single Core 2.6GHz/1MB (Opteron Model 152) Processor, NVIDIA Quadro FX1400 Graphics Accelerator, 2GB unbuffered ECC PC3200 (DDR-400) Memory (2 * 1GB ECC DIMM), 250-GB 7200rpm Serial ATA 1.5Gbps Hard Disk, 1 * DVD-Dual, 1 * 10/100/1000 BaseT Ethernet port, 6 * USB 2.0 ports, 2 * IEEE1394a ports, 1 * PCI-Express x16 slot, 2 * PCI-Express x1 slots, 4 * Conventional PCI slot |
| A63-LFZ1-AC-1GB-DR | RoHS-compliant Single Core 2.2GHz/1MB (Opteron Model 148) Processor, NVIDIA Quadro NVS280 Graphics Accelerator, 1GB unbuffered non-ECC PC3200 (DDR-400) Memory (2 * 512MB ECC DIMM), 80-GB 7200rpm Serial ATA 1.5Gbps Hard Disk, 1 * DVD-ROM, 1 * 10/100/1000 BaseT Ethernet port, 6 * USB 2.0 ports, 2 * IEEE1394a ports, 1 * PCI-Express x16 slot, 2 * PCI-Express x1 slots, 4 * Conventional PCI slot |
| A63-LFB1-AC-1GB-DR | <u>NOT RoHS-compliant</u> Single Core 2.2GHz/1MB (Opteron Model 148) Processor, NVIDIA Quadro NVS280 Graphics Accelerator, 1GB unbuffered non-ECC PC3200 (DDR-400) Memory (2 * 512MB ECC DIMM), 80-GB 7200rpm Serial ATA 1.5Gbps Hard Disk, 1 * DVD-ROM, 1 * 10/100/1000 BaseT Ethernet port, 6 * USB 2.0 ports, 2 * IEEE1394a ports, 1 * PCI-Express x16 slot, 2 * PCI-Express x1 slots, 4 * Conventional PCI slot |
| A63-LWZ1-AE-512-DR | <u>NOT RoHS-compliant</u> Single Core 1.8GHz/1MB (Opteron Model 144) Processor, on-board Rage XL PCI Graphics Controller, 512MB unbuffered non-ECC PC3200 (DDR-400) Memory (2 * 256MB non-ECC DIMM), 80-GB 7200rpm Serial ATA 1.5Gbps Hard Disk, 1 * DVD-ROM, 1 * 10/100/1000 BaseT Ethernet port, 6 * USB 2.0 ports, 2 * IEEE1394a ports, 1 * PCI-Express x16 slot, 2 * PCI-Express x1 slots, 4 * Conventional PCI slot |
| A63-LWB1-AE-512-DR | <u>NOT RoHS-compliant</u> Single Core 1.8GHz/1MB (Opteron Model 144) Processor, on-board Rage XL PCI Graphics Controller, 512MB unbuffered non-ECC PC3200 (DDR-400) Memory (2 * 256MB non-ECC DIMM), 80-GB 7200rpm Serial ATA 1.5Gbps Hard Disk, 1 * DVD-ROM, 1 * 10/100/1000 BaseT Ethernet port, 6 * USB 2.0 ports, 2 * IEEE1394a ports, 1 * PCI-Express x16 slot, 2 * PCI-Express x1 slots, 4 * Conventional PCI slot |

Sun Ultra 20 Workstation X-Options and XATO Options

The following are part numbers and descriptions for the Sun Ultra 20 Workstation X-Options and XATO (External Assemble to Order) options.

Table 9-2: Sun Ultra 20 Workstation Options

| Part Number | Description |
|-------------|--|
| A63-AA | <u>NOT RoHS-compliant</u> Sun Ultra 20 Workstation 1-socket AMD Opteron -based workstation base system - Chassis Motherboard, 1x available external bay, 2x available internal bays, 1x10/100/1000 Ethernet ports, 1x PCI-Express x16 slot (for graphics card), 2x PCI-Express x1 slots, 4x Conventional PCI slot, internal AC Power Supply. XATO ONLY |
| A63-AA-RoHS | RoHS-compliant Sun Ultra 20 Workstation 1-socket AMD Opteron -based workstation base system - Chassis Motherboard, 1x available external bay, 2x available internal bays, 1x10/100/1000 Ethernet ports, 1x PCI-Express x16 slot (for graphics card), 2x PCI-Express x1 slots, 4x Conventional PCI slot, internal AC Power Supply. XATO ONLY |
| X3798A-Z | RoHS-compliant X-Option Opteron Model 180 Processor (Dual 2.4GHz cores) for Sun Ultra 20 Workstation |
| X3798A | <u>NOT RoHS-compliant</u> X-Option Opteron Model 180 Processor (Dual 2.4GHz cores) for Sun Ultra 20 Workstation |
| 3798A-Z | RoHS-compliant ATO Option Opteron Model 180 Processor (Dual 2.4GHz cores) for Sun Ultra 20 Workstation |
| 3798A | <u>NOT RoHS-compliant</u> ATO Option Opteron Model 180 Processor (Dual 2.4GHz cores) for Sun Ultra 20 Workstation |
| 3797A-Z | RoHS-compliant ATO Option Opteron Model 154 Processor (Single 2.8GHz core) for Sun Ultra 20 Workstation |
| 3797A | <u>NOT RoHS-compliant</u> ATO Option Opteron Model 154 Processor (Single 2.8GHz core) for Sun Ultra 20 Workstation |
| 8003A-Z | RoHS-compliant ATO Option Opteron Model 152 Processor (Single 2.6GHz core) for Sun Ultra 20 Workstation |

| Part Number | Description |
|-------------------|--|
| 8003A | <u>NOT RoHS-compliant</u> ATO Option Opteron Model 152 Processor (Single 2.6GHz core) for Sun Ultra 20 Workstation |
| 8004A-Z | RoHS-compliant ATO Option Opteron Model 148 Processor (Single 2.2GHz core) for Sun Ultra 20 Workstation |
| 8004A | <u>NOT RoHS-compliant</u> ATO Option Opteron Model 148 Processor (Single 2.2GHz core) for Sun Ultra 20 Workstation |
| 8005A-Z | RoHS-compliant ATO Option Opteron Model 144 Processor (Single 1.8GHz core) for Sun Ultra 20 Workstation |
| 8005A | <u>NOT RoHS-compliant</u> ATO Option Opteron Model 144 Processor (Single 1.8GHz core) for Sun Ultra 20 Workstation |
| 8006A-Z | RoHS-compliant ATO Option 2-GB Unbuffered ECC PC3200 Memory Kit (2x 1GB ECC) for Sun Ultra 20 Workstation. |
| 8006A | <u>NOT RoHS-compliant</u> ATO Option 2-GB Unbuffered ECC PC3200 Memory Kit (2x 1GB ECC) for Sun Ultra 20 Workstation. |
| X8006A-Z | RoHS-compliant X-Option 2-GB Unbuffered ECC PC3200 Memory Kit (2x 1GB ECC) for Sun Ultra 20 Workstation. |
| X8006A | <u>NOT RoHS-compliant</u> X-Option 2-GB Unbuffered ECC PC3200 Memory Kit (2x 1GB ECC) for Sun Ultra 20 Workstation. |
| 8007A-Z | RoHS-compliant ATO Option 1-GB Unbuffered ECC PC3200 Memory Kit (2x 512MB ECC) for Sun Ultra 20 Workstation. |
| 8007A | <u>NOT RoHS-compliant</u> ATO Option 1-GB Unbuffered ECC PC3200 Memory Kit (2x 512MB ECC) for Sun Ultra 20 Workstation. |
| X8007A-Z | RoHS-compliant X-Option 1-GB Unbuffered ECC PC3200 Memory Kit (2x 512MB ECC) for Sun Ultra 20 Workstation. |
| X8007A | <u>NOT RoHS-compliant</u> X-Option 1-GB Unbuffered ECC PC3200 Memory Kit (2x 512MB ECC) for Sun Ultra 20 Workstation. |
| 8008A-Z | RoHS-compliant ATO Option 512-MB Unbuffered Non-ECC PC3200 Memory Kit (2x 256MB non-ECC) for Sun Ultra 20 Workstation |
| 8008A | <u>NOT RoHS-compliant</u> ATO Option 512-MB Unbuffered Non-ECC PC3200 Memory Kit (2x 256MB non-ECC) for Sun Ultra 20 Workstation |
| X8008A-Z | RoHS-compliant X-Option 512-MB Unbuffered Non-ECC PC3200 Memory Kit (2x 256MB non-ECC) for Sun Ultra 20 Workstation |
| X8008A | <u>NOT RoHS-compliant</u> X-Option 512-MB Unbuffered Non-ECC PC3200 Memory Kit (2x 256MB non-ECC) for Sun Ultra 20 Workstation |
| 7264A | RoHS-compliant ATO NVIDIA Quadro FX3450 Graphics Accelerator |
| X7264A | RoHS-compliant X-Option NVIDIA Quadro FX3450 Graphics Accelerator |
| 7265A | RoHS-compliant ATO NVIDIA Quadro FX1400 Graphics Accelerator |
| 8009A | <u>NOT RoHS-compliant</u> ATO NVIDIA Quadro FX1400 Graphics Accelerator |
| X7265A | RoHS-compliant X-Option NVIDIA Quadro FX1400 Graphics Accelerator |
| X8009A | <u>NOT RoHS-compliant</u> X-Option NVIDIA Quadro FX1400 Graphics Accelerator |
| 7298A | RoHS-compliant ATO NVIDIA Quadro FX540 Graphics Accelerator |
| X7298A | RoHS-compliant X-Option NVIDIA Quadro FX540 Graphics Accelerator |
| 7266A | RoHS-compliant ATO NVIDIA Quadro NVS285 PCI-Express Graphics Accelerator |
| 8010A | <u>NOT RoHS-compliant</u> ATO NVIDIA Quadro NVS280 PCI-Express Graphics Accelerator |
| X7266A | RoHS-compliant X-Option NVIDIA Quadro NVS285 Graphics Accelerator |
| X8010A | <u>NOT RoHS-compliant</u> X-Option NVIDIA Quadro NVS280 Graphics Accelerator |
| RB-ST1CE-500GB7K | RoHS-compliant ATO 500-GB Internal Serial ATA (SATA) Hard Drive |
| XRБ-ST1CE-500GB7K | RoHS-compliant X-Option 500-GB Internal Serial ATA (SATA) Hard Drive |
| RB-ST1CE-250GB7K | RoHS-compliant ATO 250-GB Internal Serial ATA (SATA) Hard Drive |
| 8011A | <u>NOT RoHS-compliant</u> ATO 250-GB Internal Serial ATA (SATA) Hard Drive |
| XRБ-ST1CE-250GB7K | RoHS-compliant X-Option 250-GB Internal Serial ATA (SATA) Hard Drive |
| X8011A | <u>NOT RoHS-compliant</u> X-Option 250-GB Internal Serial ATA (SATA) Hard Drive |
| RB-ST1CE-80GB7K | RoHS-compliant ATO 80-GB Internal Serial ATA (SATA) Hard Drive |
| 8012A | <u>NOT RoHS-compliant</u> ATO 80-GB Internal Serial ATA (SATA) Hard Drive |
| XRБ-ST1CE-80GB7K | RoHS-compliant X-Option 80-GB Internal Serial ATA (SATA) Hard Drive |
| X8012A | <u>NOT RoHS-compliant</u> X-Option 80-GB Internal Serial ATA (SATA) Hard Drive |
| 8013A-Z | RoHS-compliant ATO Option DVD Dual |
| 8013A | <u>NOT RoHS-compliant</u> ATO Option DVD Dual |
| 8014A-Z | RoHS-complaint ATO Option DVD-ROM |
| 8014A | <u>NOT RoHS-compliant</u> ATO Option DVD-ROM |
| 8015A-Z | RoHS-compliant ATO Option DVI-to-VGA Adapter |

| Part Number | Description |
|-------------|--|
| 8015A | NOT RoHS-compliant ATO Option DVI-to-VGA Adapter |
| X8015A-Z | RoHS-compliant X-Option DVI-to-VGA Adapter |
| X8015A | NOT RoHS-compliant X-Option DVI-to-VGA Adapter |

Sun Ultra 20 Workstation Display Options

The following are part numbers and descriptions for the various the Sun Ultra 20 Workstation display options.

Table 9-5: Sun Ultra 20 Workstation Display Options

| Part Number | Description |
|-------------|------------------------------------|
| X7197A | Sun 24.1-inch LCD |
| X7149A | Sun 22-inch flat screen AG CRT |
| X7144A | Sun 19-inch Sun TFT flat panel LCD |
| X7147A | Sun 17-inch Sun color CRT |

Ordering Country Kits (Mouse, Keyboards, and Power Cords)

Starting January 17, 2006, the “M29” mouse will be removed from the shipping package of the Sun Ultra 20 Workstation. Customers will be able to order Type 7 country kits, instead of the power cord and keyboard, separately.

The next-generation Type 7 mouse has a scroll wheel, instead of no scroll wheel on the existing Type 6 mouse. The next-generation Type 7 mouse is optical (no moving parts), instead of using a ball on the existing Type 6 mouse.

Table 9-6: Sun Type 7 Country Kits

| Country | Part Number |
|--------------------------|-------------|
| Type 7 Arabic | X3791A |
| Type 7 Australian | X3766A |
| Type 7 Belgian | X3790A |
| Type 7 Chinese | X3782A |
| Type 7 Danish | X3763A |
| Type 7 Dutch/Netherlands | X3765A |
| Type 7 Euro Universal | X3868A |
| Type 7 Euro UNIX | X3759A |
| Type 7 Finnish | X3767A |
| Type 7 French | X3732A |
| Type 7 German | X3733A |
| Type 7 Italian | X3764A |
| Type 7 Japanese | X3756A |
| Type 7 Korean | X3755A |
| Type 7 Norwegian | X3760A |
| Type 7 Portuguese | X3761A |
| Type 7 Russian | X3785A |
| Type 7 Spanish | X3762A |
| Type 7 Swedish | X3736A |
| Type 7 Swiss-French | X3734A |
| Type 7 Dutch/Netherlands | X3765A |
| Type 7 Euro Universal | X3868A |
| Type 7 Euro UNIX | X3759A |
| Type 7 Finnish | X3767A |
| Type 7 French | X3732A |
| Type 7 German | X3733A |
| Type 7 Italian | X3764A |
| Type 7 Japanese | X3756A |
| Type 7 Korean | X3755A |

| Country | Part Number |
|----------------------|-------------|
| Type 7 Norwegian | X3760A |
| Type 7 Portuguese | X3761A |
| Type 7 Russian | X3785A |
| Type 7 Spanish | X3762A |
| Type 7 Swedish | X3736A |
| Type 7 Swiss-French | X3734A |
| Type 7C Swiss-German | X3735A-COM |
| Type 7C Taiwanese | X3754A-COM |
| Type 7C Turkish-Q | X3787A-COM |
| Type 7C UK | X3737A-COM |
| Type 7C US PC | X3731A-COM |

Diskless Configurations

SunFed customers can order diskless configurations of the Sun Ultra 20 Workstation through ATO only. Diskless means the Sun Ultra 20 Workstation will be sold without any hard disk drives (HDD) and without the DVD recorder.

Availability

The Sun Ultra 20 Workstation reached General Availability on September 12, 2005.

10.0 Sun Enterprise Services Offerings

The SunSpectrum Service Plan

The SunSpectrum Service Plan is an innovative and flexible service offering that allows customers to choose the level of service best suited to their needs, ranging from mission-critical support for maximum solution availability to backup assistance for self-support customers. The SunSpectrum Service Plan provides a simple pricing structure in which a single fee covers support for an entire system, including related hardware and peripherals, the Solaris Operating Environment software, and telephone support for Sun software packages. The majority of Sun's customers take advantage of the SunSpectrum Service Plan, underscoring the value that it represents. Customers should check with their local Sun Services representatives for program and feature availability in their areas.

SunSpectrum program support contracts are available both during and after the warranty program. Customers may choose to uplift the service and support agreement to meet their business needs by purchasing a SunSpectrum contract. Always use the SunSpectrum Service Plan for total system support when Solaris is the operating system of choice.

The four levels of SunSpectrum support contracts are outlined below.

Table 10-3: SunSpectrum Support Contracts

| Program | Description |
|--|---|
| Mission-Critical SunSpectrum Platinum SM Support | Designed to support client-workstation, mission critical solutions by focusing on failure prevention, rapid recovery and year-round technical services planning. Support is provided 24x7. |
| Business-Critical SunSpectrum Gold SM Support | Includes a complete package of proactive and responsive services for customers who require maximum uptime for their strategic business-critical systems. Support is provided 24x7. |
| System Coverage SunSpectrum Silver SM Support | Combines the service expertise, responsive on-site support and technical support by telephone and SunSolve CD/on-line services. Support is provided 8 AM to 8 PM Monday through Friday. |
| Self-Directed SunSpectrum Bronze SM Support | Provided for customers who rely primarily upon their own in-house service capabilities. Enables customers to deliver high quality service by giving them access to UNIX [®] expertise, Sun certified replacement parts, software releases and technical tools. Support is provided 8 AM to 5 PM Monday through Friday. |

Warranty Upgrade to SunSpectrum Service for Sun Ultra 20 Workstation

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

Table 10-1: SunSpectrum Service Parts for Sun Ultra20 Workstation

| Part Number | Description |
|---------------|---|
| W9D-A63-1S | Upgrade to 1 Year SunSpectrum Silver for Sun Ultra20 Workstation |
| W9D-A63-2S | Upgrade to 2 Years SunSpectrum Silver for Sun Ultra20 Workstation |
| W9D-A63-3S | Upgrade to 3 Years SunSpectrum Silver for Sun Ultra20 Workstation |
| W9D-A63-1G | Upgrade to 1 Year SunSpectrum Gold for Sun Ultra20 Workstation |
| W9D-A63-2G | Upgrade to 2 Years SunSpectrum Gold for Sun Ultra20 Workstation |
| W9D-A63-3G | Upgrade to 3 Years SunSpectrum Gold for Sun Ultra20 Workstation |
| W9D-A63-24-1G | Upgrade to 1 Year SunSpectrum Gold 7x24 Onsite for Sun Ultra20 Workstation |
| W9D-A63-24-2G | Upgrade to 2 Years SunSpectrum Gold 7x24 Onsite for Sun Ultra20 Workstation |
| W9D-A63-24-3G | Upgrade to 3 Years SunSpectrum Gold 7x24 Onsite for Sun Ultra20 Workstation |
| W9D-A63-1P | Upgrade to 1 Year SunSpectrum Platinum for Sun Ultra20 Workstation |
| W9D-A63-2P | Upgrade to 2 Years SunSpectrum Platinum for Sun Ultra20 Workstation |
| W9D-A63-3P | Upgrade to 3 Years SunSpectrum Platinum for Sun Ultra20 Workstation |

Sun Hardware Only Service Plan

In-warranty or out-of-warranty, the Sun Hardware Only Service Plan provides an affordable, convenient way to maintain Sun systems. With easy access to Sun technical support and quick system repair or replacement, and to Sun's Online Support Center, Sun Hardware Only Service Plan has customers covered so they can truly get the most out of their time and investment in Sun technologies.

The extended features of Sun Hardware Only Service Plan now allow customers to choose the service that best supports their business needs by offering a choice of coverage hours and response times, which include:

- Technical support during hours that suit the customer's business requirements
- Hardware service with a choice of coverage hours and response times ranging from next business day to 7x24 support
- Online support capabilities including Web-based service requests, service status, access to technical resources, and more

Always use Sun Hardware Only Service Plan for a more cost effective support solution where the Sun Ultra20 Workstation is deployed with Linux or Windows.

Warranty Upgrade to Sun HW Only Service for Sun Ultra 20 Workstation

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

Table 10-1: Sun HW Only Service Parts for Sun Ultra20 Workstation

| Part Number | Description |
|---------------|--|
| W9D-A63-SD-1H | Upgrade to 1 Year Sun HW Only Same Day for Sun Ultra 20 Workstation |
| W9D-A63-SD-2H | Upgrade to 2 Years Sun HW Only Same Day for Sun Ultra 20 Workstation |
| W9D-A63-SD-3H | Upgrade to 3 Years Sun HW Only Same Day for Sun Ultra 20 Workstation |
| W9D-A63-24-1H | Upgrade to 1 Year Sun HW Only 7x24 for Sun Ultra 20 Workstation |
| W9D-A63-24-2H | Upgrade to 2 Year Sun HW Only 7x24 for Sun Ultra 20 Workstation |
| W9D-A63-24-3H | Upgrade to 3 Year Sun HW Only 7x24 for Sun Ultra 20 Workstation |

The Online Support Center

The Online Support Center (OSC) provides Web-based solutions anytime, anywhere. Providing high-quality availability services has always been a top priority at Sun. As a pioneer in web-based customer solutions, Sun continues to utilize the power and versatility of the Internet to offer customers a broad variety of online service offerings.

The online answer/transaction process can save customers valuable time by eliminating the time spent waiting on the phone for a customer service representative. The Online Support Center empowers the user by offering anywhere, anytime access to Web-based support, training, and consulting solutions for Sun hardware and software products. The site serves as a portal for proactive service offerings, systems support features, and resource links.

For more information on the any of the above Sun support offerings, please visit:
<http://www.sun.com/service/support>.

11.0 Other Useful Documents

Table 11-1: Additional documents related to Sun Ultra 20 Workstation

| Title | SunWIN Token # |
|--|----------------|
| Sun Ultra 20 Workstation Datasheet | 443530 |
| Sun Ultra 20 Sun Services Datasheet | 443531 |
| Workstations Beat Sheet: Marrakesh vs. HP, Dell and IBM Pentium 4-based Workstations | 443532 |
| Sun Ultra 20 Just The Facts | 443533 |
| Sun Ultra 20 Customer Presentation | 443534 |
| Sun Ultra 20 Workstation Photographs | 443535 |
| Sun Ultra 20 Workstation Technical Architecture Whitepaper | 443536 |