Sun™ Netra™ t 1125

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Sun microsystems

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Sun™ Netra™ t 1125 Systems Positioning

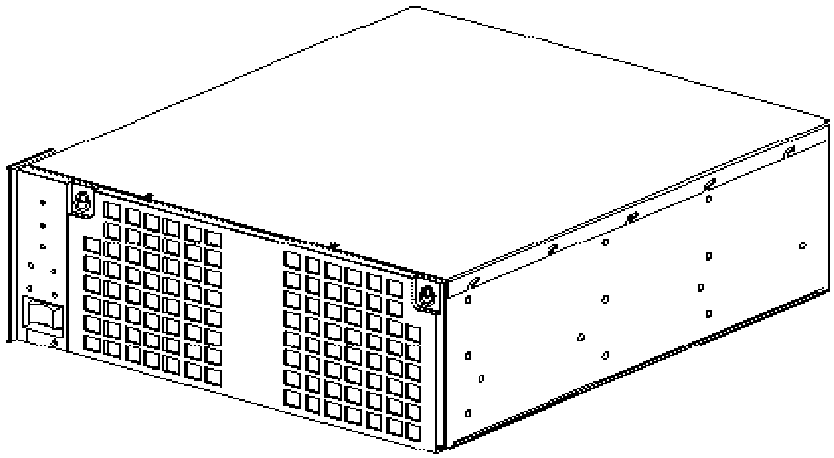

Figure 1. The Sun™ Netra™ t 1125 System

Product Overview

In telecommunications network environments there has been a move towards standard, open, computer systems for service nodes, network elements, and network servers. These systems need to meet a number of requirements. For deployment in the central office, the strongest packaging with full NEBS compliance and -48VDC is required. The Sun™ Netra™ t 1120 system was developed to meet these requirements.

In the telecommunications marketplace an increasing number of enhanced services are being provided "off-switch" and outside the telco central office. The environment still requires products built to mission-critical standards, as well as having high performance, and with the ability to be rack mounted. However, instead of the special -48V DC power required in telco central office, AC power is required. AC power is also required for deployment in other environments such as computer rooms as part of network infrastructures for Internet Service Providers or corporate intranets. Although the rack mount form and compact modular design are also required in all these environments. The Netra t 1125 server is the first development in a family of platforms being developed by Sun to meet this need, by offering Sun's open architecture, advanced technology, and price-performance, coupled with the high-quality manufacturing and global service for which Sun is recognized.

The Netra t 1125 system is identical to Netra t 1120 system, except that it has AC power supply. The Netra t 1125 system increases Sun's presence in the rapidly expanding network server market. The requirement is increasingly for computer systems to be located in the same enclosures as network transmission equipment, such as routers and hubs. Space is often limited, so a compact server with a small footprint and minimal height is a necessity. In addition, network servers in this environment must have the capacity for high Internet Protocol (IP) traffic and the capability of supporting other communications protocols.

The Netra t 1125 system incorporates standard Sun UltraSPARC™-II technology (the Ultra™ 60 workstation) and standard storage together with a AC power supply and enclosure to provide affordable rackmountable network servers from a major open systems supplier. By selecting the Netra t 1125 system, a networking customer can develop applications on a commercial workstation or server and deploy them without modification.

The Netra t 1125 system is either a single- or dual-processor unit, based on the UltraSPARC-II 300-MHz processor, and can be purchased with varied combinations of memory from 128 MB to 2 GB, and internal disk capacities from 9 GB to 18.2 GB. The system has four PCI 2.1-compliant expansion slots on the motherboard as well as console, modem, external SCSI, and Ethernet. There is support for two RMM drives (CD + DAT).

To complete the network connectivity requirements a number of PCI cards are available from Sun, such as X25, SunHSI™, SunFDDI™, SunATM™, Sun™ Quad FastEthernet™, and Sun GigabitEthernet.

The Netra t 1125 system also benefits from its use of the same enclosure used for the Netra t 1120.

The Netra t 1125 system is NEBS Level 3 certified by Bellcore ensuring that it is suitable for deployment in the harshest of office or field locations.

The Netra t 1125 system is rack-mountable in 19-inch, 23-inch, 24-inch, and 600mm racks.

An alarm facility is provided to support network management and system monitoring requirements

The Sun Netra t 1125 System at a Glance

Product Specifications	Sun Netra t 1125
Dimensions	177mm (6.97 inches/4U) x 435mm (17.13 inches) x 496mm (19.53 inches) (HxWxD)
Weight	23.18 kg (51.0 pounds)
CPU • Architecture • Clock rate • Cache on module	 1 or 2 Processors, UltraSPARC-II 300 MHz 2-MB Ecache
Memory • Memory type • DRAM speed • Bus width • SIMM sizes	 128 MB to 2 GB with 128-MB SIMMs, ECC 60 ns 1*576 bits 32 MB, 64 MB, and 128 MB
Storage • Maximum internal • Number of bays	 40 MB/second UltraSCSI, 18.2 GB 2 x 1/1.6-inch drive bays
I/O Architecture • PCI Bus • Serial ports • Parallel port	 Four PCI Slots: 3 x 33 MHz, 1 x 33/66 MHz, 64-bit slots Two asynch (76.8 Kbaud)/synch (64 Kbaud) DB25
Networking Ports	TP Ethernet 100BASE-T/10BASE-T or external transceiver through MII connector
Backup and Distribution • Internal • External	 Optional 12X SunCD™ drive External SCSI interface allows connection of any compatible device
Operating Environment	• Solaris™ 2.5.1 Hardware: 11/97 or 2.6 Hardware: 3/98 • Solaris™ for ISPs™

Product Placement

The Netra t 1125 system is a cost-effective rackmountable server for the telecommunications and network communications market. The Netra t 1125 builds on the success of the Netra t 1120 system, which together offer a unique product line in Sun's range. Sun's other server products are available with a number of rackmount kits or options, but only the Netra t servers meet the stringent environmental reliability requirements of telecommunications market while offering a chassis designed for rackmounting in either DC or AC power environments. Within Sun's commercial product range the Netra t 1125 can be considered a rackmountable server version of the Sun Ultra 60 system, with additional alarm and monitoring features. Sun has recently introduced the Sun™ Enterprise™ 250 workgroup server.

Following is a summary of the differences between the Netra t 1125 server, Ultra 60 workstation, and Sun Enterprise 250 workgroup server.

	Netra t 1125	**Ultra 60**	**Sun Enterprise 250**
CPU Type	Dual UltraSPARC-II	Dual UltraSPARC-II	Dual UltraSPARC-II
Maximum Memory	2 GB	2 GB	2 GB
Packaging	Bellcore NEBS Level 3 Certified Server.	Commercial/Desktop Tower	Commercial/Workgroup Server Tower
Rack Mountable	Standard telco rack (19-inch, 23-inch, 24-inch, 600mm)	No	Standard 19-inch rack
Frame buffer/ monitor support	No	Yes	Yes
Keyboard	No	Yes	Yes
Size	6.97 x 17.13 x 19.53 inches	17.7 x 7.5 x 19.6 inches	20.3 x 10.3 x 28.8 inches
Maximum Internal Storage	36 GB	36 GB	108 GB
Alarms	Yes	No	No
Audio	No	Yes	Yes

Key Messages

The Netra t 1125 system is a low-cost server specifically designed for easy deployment in a network environment.

- Rugged. Certification to Bellcore NEBS Level 3 (mission critical) standard means that the Netra t 1125 server meets the most extreme environmental requirements
- Alarm capability to conform to central office alarm and system management requirements
- AC power supply, otherwise same features as DC product (Netra t 1120 for telco central office
- Advanced price-performance with single- or dual-processor, 300-MHz Ultra Port Architecture. Modular system architecture means that system can easily be upgraded to faster processor technology
- Compact, modular and flexible enabling technology for telco and internet service applications
- Packaging for easy integration into customer's communications equipment, with a variety of rack-mounting options
- Serviceable. Units are easily removed for quick repair
- System level sparing
- Leverages latest Sun UltraSPARC-II technology
- Uses Solaris 2.5.1 Hardware: 11/97 or 2.6 Hardware: 3/98 to give a single environment from development to deployment
- Uses industry standard PCI I/O bus, allowing customers to integrate a standard PCI 2.1-compliant I/O card
- Worldwide service and support
- A product for all channels selling to network service providers

Availability

The Netra t 1125 systems will begin shipping September 20, 1998.

Target Markets

Traditionally, computer platforms in the telecommunications and network infrastructures have been of two types:

- Computers (often fault-tolerant) used as an adjunct processor to a switch
- Computers embedded into equipment developed by a telecommunications manufacturer

In both the telecommunications and data communications environments computers are being used much more to provide the services for the subscribers; these services are being embedded in the telco switches or as part of large servers or mainframes in the data communication environment.

The Intelligent Network in telco and the emergence of IP networks as the dominant data communications protocol has changed everything. Both are similar in concept in that the transmission switching and routing functions have been separated from the service provision. This has led to a service node concept where new services can be introduced quickly at relatively low cost. To achieve this the service node relies on compact, inexpensive and flexible computers that adhere to open standards and widely available hardware and software products. The Netra t 1125 system is focused directly on these needs and market trends.

In the Internet Service Provider and Corporate Intranet Provider marketplaces there is a relentless growth to provide new services. Some of these services can be consolidated and provided on large UNIX® servers. However the speed of service introduction and the business model of most Internet Service Providers determine that horizontal scalability is needed.

Requirements are twofold:

- add specific services when needed on dedicated compute servers.
- a certain degree of scalability within each server and also for the server to be part of their overall communications environment.

The Netra t 1125 system has been designed to meet the specific needs of the Network Provider market. Typical applications include;

- Subscriber services: mail, news, http hosting, applet servers
- Network Services: proxy/cache, policy management, directory services
- Network Management: load balancing servers, failover services

Although the Netra t 1125 system has been designed with an AC power supply, a number of the telco Internet Service Providers are looking to deploy their forthcoming network services in central office environments. In addition, independent Internet Service Providers are providing or managing services on behalf of telco Internet Service Providers in the same central office environments.

In the telecommunications sector Sun's existing Netra t 1120 system fulfills the needs of deployment into central office because of its -48V DC power input; however many services developed as part of the Intelligent Network-enhanced services growth are deployed outside of central office and require AC power input. In this case typical Netra t 1125 applications would include:

- Voice Messaging
- SMS (Short Message Service)
- Element Management

In the telco environment Sun is in the unique position of being able to offer the same form and high-performance product with both power options; AC power input with the Netra t 1125 system and DC power input with the Netra t 1120 system. In all other aspects the servers are the same. This means customers do not have to compromise or incur greater cost to get the product they need.

With Sun there is no need to compromise. A network provider who deploys an application on a Netra t 1125 system in commercial environments and wishes to deploy the same application in telco central office can simply use the Netra t 1120 system.

With the opening of the telco services marketplace a number of new suppliers have entered; this means that the Netra t 1125 system is attractive to the reseller who provides a small number of products as well as the systems integrator, OEM, and NEP who look to embed or integrate corporate elements into their products.

An even bigger opportunity exists with Sun's indirect channel partners who provide and supply the commercial network services market. Resellers who provide the small-medium enterprises and also the corporate resellers who provide product to the very large enterprises will be greatly attracted to this product's direct relevance to the networking requirements of their customers.

Target Accounts

Currently, the following accounts are being targeted for the Netra t 1125 system:

- Internet service providers including cable service providers
- Telecommunications equipment manufacturers worldwide
- Hardware/software system integrators selling to the network services market
- Telecommunications service providers
- Corporate customers deploying Intranet services

Network Systems Sales Development will be managing a program to identify and focus on the key target accounts in these market segments. The following are some typical target accounts:

- UUNet
- AOL
- Level 3
- PSINet
- Digex
- NSI
- GPT
- British Telecom
- Deutsche Telecom
- Bell Atlantic
- France Telecom
- Sprint
- GTE
- Brite Voice

Compatibility

The Netra™ t 1125 system runs Solaris™ 2.5.1 Hardware: 11/97 or 2.6 Hardware: 3/98. As a result, it can run 32-bit applications unmodified from the Solaris 2.3 and Solaris 2.4 Operating Environment; therefore these new systems are totally compatible with previous systems and software.

Market Value Propositions

- Sun's expertise in developing equipment for the telecommunications industry allows OEMs and Internet Service Providers to invest in server technology that is reliable and yet meets todays highest performance requirements.
- As a result of the scalability and flexibility of the UltraSPARC™ architecture, a company can better protect its investment in hardware and software.
- As a result of Sun's UltraSPARC architecture, a company will notice the significant improvement in application performance and user productivity.
- As a result of Sun's I/O and networking performance, customers will benefit from increased application performance and user productivity.
- The Netra t family of servers are the only products with NEBS Level 3 (mission critical) certification from Bellcore.

Enabling Technologies

Telecommunications Packaging

Sun's Netra™ t 1125 system is based on the technology developed for the Ultra™ 60 product and packaged to meet the stringent requirements of the telecommunications industry. The Netra t series represents the first servers for the Telco industry that are NEBS (Network Equipment Building Systems) Level 3 Certified by Bellcore for Central Office (mission critical) deployment.

- Alarms system allows for easy integration into Central Office equipment
- Rack-mountable server for Central Office deployment

UltraSPARC™ -II Processor

The Netra t 1125 system is a shared-memory, multi-tasking, multiprocessor system built around the new UltraSPARC™-II microprocessor family. The UltraSPARC-II is Sun's latest generation of the SPARC™ family and the second generation of 64-bit UltraSPARC chips. The UltraSPARC-II processor used in the Netra t 1125 system has a clock rate of 300 MHz.

- Modules have the 64-bit SPARC V9 architecture
- Systems have 2 MB of Ecache per CPU
- As a member of the UltraSPARC family of CPUs, full binary compatibility is assured

PCI Technology

System I/O for the Netra t 1125 system is provided by two industry-standard Peripheral Component Interconnect (PCI) data buses. All PCI buses in the Netra t 1125 system comply with the 2.1 revision of the PCI specification, released in March 1995.

- Sun leads the industry with PCI/66, which has twice the throughput of standard PCI
- Two independent PCI buses deliver unparalleled I/O bandwidth—up to 200 MB per second sustained throughput

Technology Overview

Good performance through advanced applications typically demands excellent performance from more than one part of the system. Most often, an application consists of data fetching, computation, and presentation. Unless the system is designed to address all of these, it will always be limited by the weakest link in the chain.

The Sun™ Netra™ t 1125 server is designed for balanced system performance, accelerating applications at every step. Faster I/O and networking, together with the Ultra Port Architecture (UPA) interconnect, allow fast data fetching. The UltraSPARC™-II CPU provides supercomputing power, and moves data through the UPA databus at high speed.

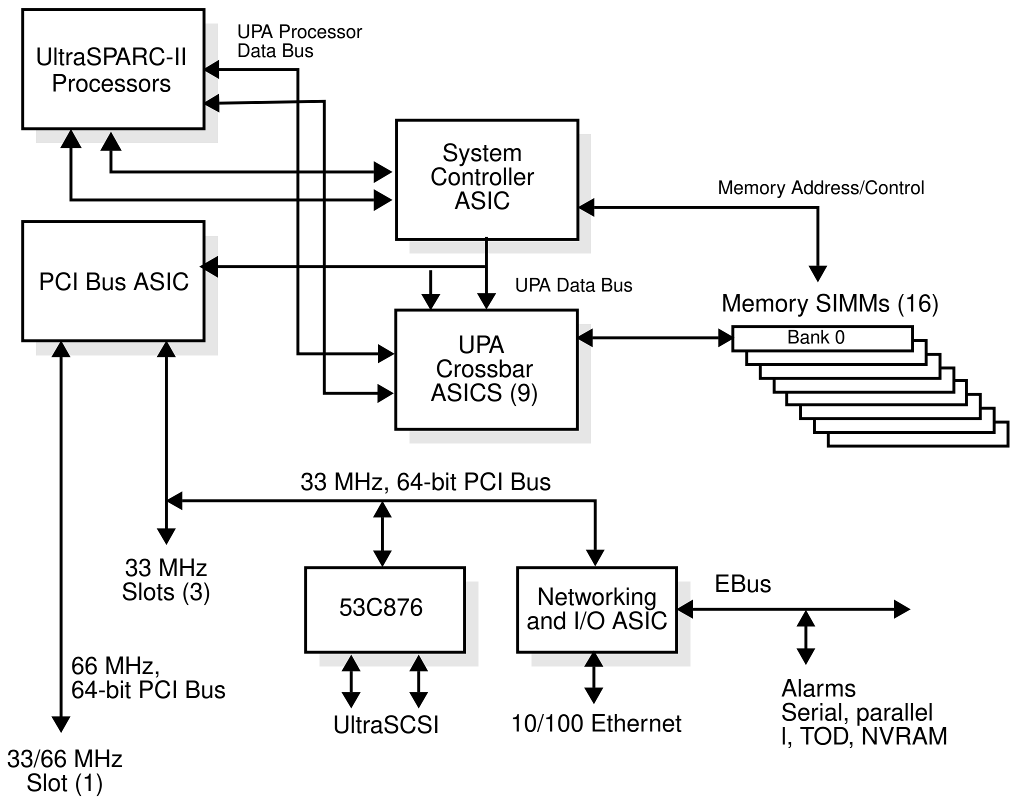

Figure 2. Architecture of the Netra t 1125 systems

The Netra t 1125 system has UPA, a packet-switched, cross-bar architecture. The Netra t 1125 system has nine buffered cross-bar switched chips that allow the memory and the UPA data bus to interconnect. This architecture is the basis for the sensational computing and I/O performance.

Key Facts

- High-performance rackmount system using the UltraSPARC-II processor
- Balanced system design
- Matching performance enhancement in I/O, networking, and memory access

Tech Facts

- New high-performance system bus
  - Fast access to memory
- Easy disk expansion
  - Up to 18 GB of internal SCSI disk storage (two 9-GB disks)
- Optional removable mass storage
  - One optional internal 12X or 32X CD-ROM drive or DAT tape
- High-performance memory subsystem
  - Up to 2 GB with 128-MB SIMMs
  - Supports standard Ultra desktop SIMMs for compatibility and investment protection
- Expansion to advanced networking
  - Built-in 100BASE-T, autosensing and autoswitchable to 10BASE-T for backward compatibility
  - MII connector for connection to other types of Ethernet transceivers and media
- New system enclosure
  - The Sun Netra t 1125 rack-mount system is fitted into a specially designed enclosure for the Telco environment
- Telco Alarms
  - Special alarm connections available for lights out operation
  - Reports on the basis of major/minor/critical alarm
  - Allows remote system reset

Telco Environmental Requirements

The Netra t 1125 system has been tested and certified by Bellcore as 100 percent conformant to Network Equipment Building Systems (NEBS) Level 3 (mission critical) SR-3580, the certificate number 970003. These tests include requirements to meet many Safety, Immunity, Radio Frequency, and Electro Magnetic standards, these are listed in full on the back of the datasheet.

Features	Benefits
• NEBS Level 3 Certified	• Central Office-ready for mission-critical deployment
• Alarms system	• Easy integration into Central Office equipment
• Rack mountable	• For Central Office deployment

NEBS with Balanced Application Performance

High performance through advanced applications demands high performance from more than one part of the system. Most often an application consists of computation, memory management and I/O. Unless the system is designed to address all of these, it will always be limited by the slowest part in the chain.

The Sun Netra t 1125 rack-mount system is designed for balanced system performance in applications. The UltraSPARC-II processor, high-speed memory bus, PCI Bus subsystem, UltraSCSI, and Fast Ethernet combine to accelerate every part of the sequence an application goes through. The faster I/O and networking, together with the UPA interconnect, enable fast data fetching. The UltraSPARC-II CPU provides supercomputing power and moves data very quickly through the UPA to maintain processing at very high speed.

This new level of computing provided by the Sun Netra t 1125 system makes it possible to build more flexible, compact, and modular applications.

Enclosure

The server enclosure is designed around the Ultra 60 motherboard. The chassis can be rackmounted horizontally into 19-inch, 23-inch, 24-inch, or 600mm rack with the appropriate kits, available as X-options. Location points for industry standard rails have been added, so customers have numerous possibilities for rack mounting.

The system is serviceable from the front, with access to disk drives and have access to the CD-ROM drive or tape, all behind the front panel that contains the air filter. Cables are all connected to the system rear. This means that systems can be rack mounted with no vertical gaps, the only reason to remove systems from a rack are for repair or to upgrade (example: with processor, memory, or PCI cards).

The airflow through the system has been enhanced with air flowing from the system front through to the rear where it is expelled. Four fans assist this process.

Alarms Card

One of the key features of the system is the inclusion of an alarm cards. This is located on the motherboard and has a DB15 male output at the system rear. It requires additional software drivers and packages to operate and these are supplied on a separate CD as an X-option. The alarms card monitors the system performance, for example the power inputs and the processor operation and can alert operators to system conditions through an LED on the system front panel and through the connector which could be interfaced to a remote console or other application.

The system can generate up to three alarm conditions two of which are user configurable. Also the alarms card allows the system to be reset remotely in a system hung condition.

Netra t 1125 System Architecture

The Netra t 1125 system is based around the dual UltraSPARC-II processors.

UltraSPARC™ Processor

The UltraSPARC-II is Sun's latest generation of the SPARC family and the second generation of 64-bit UltraSPARC chips. It utilizes the latest 0.35-micron technology (versus the 0.5-micron technology of the UltraSPARC-I CPU), which shrinks the die size to 149^2mm (from 218^2 mm). This reduced die size is the key to the higher clock rates and increased performance of the UltraSPARC-II CPU. This smaller die size also enables the UltraSPARC-II to operate at a core voltage of 2.5 volts, rather than 3.3 volts for the UltraSPARC-I CPU. This lower voltage reduces power consumption and allows the chip to operate at higher frequencies without increasing total power requirements or heat dissipation—both major design issues in today's high performance systems.

UltraSPARC-II processors used in the Netra t series are individually mounted on 4-inch x 6-inch, field-installable module cards along with associated UPA data buffers and 1 MB of high-speed SRAM external cache memory. These modules are standard UltraSPARC-II modules. This modular design facilitates easy system processor upgrades (to next-generation UltraSPARC processors).

Features	Benefits
• CPUs are mounted on a field-installable module card with associated UPA data buffers and 2 MB Ecache	• Facilitates easy system processor upgrades and system service
• V9, 64-bit implementation of the SPARC definition	• Very high application performance
• Integrated Visual Instruction Set (VIS™)	• Efficient process handling
• Dual UltraSPARC Architecture	• Increased performance

UPA System Bus

The Netra t 1125 processors, memory, and I/O subsystems are interconnected by the high-speed Ultra Port Architecture crossbar datapath. This is an enhanced implementation of the same UPA design used in the Ultra 1, Ultra 2, Ultra 30, and Ultra 60 workstations. The CPU datapath is 144 bits wide, with 128 bits for data and 16 bits for error correcting code (ECC). The UPA data path that support system I/O is 72 bits wide, with 64 bits for data and 8 bits for ECC. The memory interface supports a single, 576-bit-wide data path.

With the 300-MHz CPU installed, the UPA clocks at 100 MHz. CPU segments, which transfer 16 bytes of data in parallel each clock cycle, each have a maximum transfer rate of 1.6-GB per second. The Netra t 1125 server also has the capability to run the UPA at 120 MHz (up to 1.9 GB per second throughput) to support the next generation of UltraSPARC-II processors.

Feature	Benefit
• Single 576-bit wide, high-speed memory bus	• High-performance memory access • Flexibility in memory expansion options
• 120-MHz capable UPA	• Upgrade to next-generation UltraSPARC-II processors

Memory

The Netra t 1125 system supports up to 2 GB of 60-ns, 5-volt, dynamic RAM memory. Double in-line memory modules (DIMMs) used by the Netra t 1125 system are the same type as those used in the Ultra 1, Ultra 2, Ultra 30, and Ultra 60 workstations. Memory is organized into four banks of four DIMMs. To utilize the Netra t 1125 memory interleaving feature for best system performance, memory DIMMs should be installed in sets of four of identical DIMMs. This memory interleaving feature allows flexibility in memory expansion options.

Feature	Benefit
• With two banks of DIMMs installed, (memory installed in sets of four) memory operations can be two-way interleaved	• Reduces the average latency for reads and writes almost in half, and nearly doubles the memory throughput over non-interleaved operations

System I/O—High-Performance PCI Technology

System I/O for the Netra t 1125 server is provided by two industry-standard Peripheral Component Interconnect (PCI) data buses. All PCI buses in the Netra t 1125 system comply with the 2.1 revision of the PCI specification, released in March 1995.

- PCI slot 1 operates at 33-MHz or 66-MHz and supports either a 32-bit or 64-bit, 3.3 volt or universal PCI card on an independent bus.
- PCI slots 2–4 operate at 33-MHz and provide for 32-bit or 64-bit, 5 volt or universal PCI cards.

Slots	Slot Width, Clock Rate	Card Input Voltages Supported
1	32 or 64 bits, 33 or 66 MHz	3.3 volt or universal
2–4	32 bits, 33 MHz 64 bits, 33 MHz	5 volt or universal

In addition to the I/O capabilities available through PCI option cards, the Netra t 1125 system provides the following I/O channels directly from the main system board:

- One internal/external 40-MB UltraSCSI channel with external 68-pin SCSI connector
- One external 10/100 auto-select Ethernet port (supports either a Category 5 STP, RJ45 connector, or 40-pin miniature “D” MII connection)
- One external 2-MB Centronics-compatible, bidirectional, EPP parallel port with one DB25 connector
- Two external EIA-232C or EIA-423 serial ports via two DB25 connectors (support EIA-423 synchronous data rates from 50 baud to 384 Kbps and asynchronous data rates from 50 baud to 460.8 Kbaud)

Netra t 1125 is a headless server. It does not have connectors for graphics, keyboard, or mouse. You can connect a standard serial terminal to one of the serial ports and use it as the system console.

Feature

- 33/66-MHz clock/64-bits wide
- 133-MB/seccond bandwidth (peak)
- Compatible with PCI 2.1
- Four expansion slots

Benefit

- Highest performance PCI bus in the industry
- High data throughput
- Access to many third-party I/O solutions
- Allows I/O expansion

Storage

Internal data storage for the Netra t 1125 server is provided by up to two 3.5-inch by 1-inch or 3.5-inch by 1.6-inch UltraSCSI disk drives. These 7200-rpm drives offer a peak data transfer rate of 40-MB per second—twice the transfer rate of Fast/Wide SCSI controllers.

Feature	Benefit
• 40-MB/second UltraSCSI	• Fast access and retrieval of mass storage data
• 9.1-GB disk options	• Flexibility in internal disk expansion and high internal capacity

In addition to its internal and external high-speed fixed storage capabilities, the Netra t 1125 server accommodates a front-access removable media device in a 1.6-inch, half-height, 5.25-inch bay for either an optional CD-ROM or DAT drive or two 3.5-inch disk drives.

Fast Ethernet

To support higher-performance network connectivity, the Netra t 1125 system supports 10/100 Mbps Fast Ethernet. Fast Ethernet technology from Sun is backwards compatible with 10 Mbps Ethernet, with the speed being autosensed by the interface.

Fast Ethernet is a direct extension of the 10BASE-T Ethernet standard, but is capable of supporting a wider range of applications requirements with its greater throughput. Particularly compelling is its compatibility with the installed base of wiring currently employed for 10BASE-T, making it the most cost-effective migration path for most users. Like its predecessor, the standards for Fast Ethernet are well-defined and accepted throughout the industry, and a large number of compatible products are available from a variety of vendors.

The Ethernet interface on the Netra t 1125 system supports access to Category 5 twisted pair through an RJ45 connector. To support a wider array of cabling options, they also feature access to a media independent interface (MII). Accessible through a 40-pin, miniature D connector, the MII allows adoption to any other form of Ethernet, including ThickNet (AUI), twisted pair, ThinNet, or Fiber.

Features	Benefits
• High-performance 100BASE-T	• Delivers fast access to network resources
• Compatibility with 10BASE-T	• Makes each system easy to deploy in existing environments
• Autosensing	• Provides transparent acceleration

Solaris™ Operating Environment

The Sun™ Netra™ t 1125 system includes the industry's leading operating environment, Solaris™. Built on the latest UNIX® technology, the Solaris environment delivers unparalleled scalability and performance. Solaris provides easy access to a wide range of computing environments and network technologies. The Solaris environment delivers a competitive advantage to business through networked computing, scalability, and multi-architecture support. It provides an advanced superior solution for all customer needs. Solaris is an industrial-grade solution with the performance, quality, and robustness to deliver mission-critical reliability.

The Solaris 2.5.1 Hardware: 11/97 or Solaris 2.6 Hardware: 3/98 are Solaris versions that support Sun Netra t 1125 systems. Solaris delivers the power of the Sun Netra t 1125 system to users through enhanced networking capabilities and performance, increased standards compliance, and key operating environment performance advancements.

Features	Benefits
• Solaris operating environment	• Industry-leading operating environment, provides single environment from development to deployment
• Over 12,000 native Solaris applications	• No redevelopment needed for deployment on Netra t 1125
• Multithreaded operating environment	• High performance and scalability in a server application

- Solaris is the only operating environment that supports Sun Netra t 1125 systems.
- Solaris is the most robust, highest quality, and best performing version of the Solaris operating environment. It takes advantage of UltraSPARC™-II processor enhancements and provides a reliable, stable platform for mission-critical applications being deployed into the Central Office.
- Features integrated into Solaris:
  – SPARCstorage™ Array drivers
  – PCMCIA drivers
  – In-kernel telnet and rlogin support
  – Kernel asynchronous I/O
  – XGL™ 3.2, XIL™ 1.2.1, Solaris™ PEX™ 3.0, OpenWindows™ 3.5
  – Real-time extensions

Solaris 2.5.1 Strengths

- Solaris offers
  - Optimized support for *Sun4u* architecture, utilizing the UltraSPARC processor's extra floating-point registers, Visual Instruction Set (VIS™), accelerated `bcopy` and `bzero` functions, and separate kernel and user address spaces
  - Improvements to the virtual memory system and kernel memory allocation to decrease system memory requirements and boost large system performance
  - Faster pipes and standard I/O to increase application I/O performance
  - NFS™ version 3, for faster network file writes and directory reads; reduces server loading
  - NFS over TCP, for better performance over wide-area networks
  - Improved network file locking (`lockd`), for faster and more reliable distributed file locking
  - Name Service Cache (NSC), providing very fast name service lookups, increasing access to directory, mail, and http
- Improved Solaris 1 compatibility
  - Support for Solaris 1 binaries that utilize a mixture of static and dynamically linked libraries
  - Additional Solaris 1 commands and library interfaces
- Improved security
  - Access control lists and NIS+ password aging
- Standards supported
  - Posix threads (1003.1c) support
  - Full X/Open® xpg4/xcu4 branding
  - X/Open XFN federated naming, allowing two or more naming services to cooperate
  - Kodak Color Management System™
  - CDE 1.0.2 and ODBC copackaged
- The Solaris environment connects users to the enterprise.
  - Provides connectivity to and/or integration with other enterprise resources
  - Supports the applications, tools, and services to retrieve, process, and manage information
  - Provides a user interface to present information; facilitates communication through a graphical user interface (GUI) and graphics, imaging, and other technology

Solaris 2.6 Strengths

Along with all the features available in Solaris 2.5.1, Solaris 2.6 includes several features and capabilities:

- Solaris Web Start, a browser-based installer that makes Solaris installation simple
- The new Java™ Virtual Machine with just-in-time (JIT) compiler
- HotJava™ Browser
- WebNFS™
- Network/web server and database performance improvements
- AnswerBook2™ on-line documentation
- Network management and system administration, such as NTP, SNMP, DMI, DHCP, and VLSM
- Year-2000 ready
- Extended language support, including new Unicode locales
- Improved graphics for X11R6 support and XIL™ 1.3, which is MT hot and safe
- Large file support for increased data storage

What's New in Solaris 2.6?

With Solaris 2.6 (Hardware: 3/98), Sun has taken the industry-standard CDE (Common Desktop Environment) and adapted it to the needs of a rapidly growing market: the entry-level workstation market. The new Solaris Desktop Extensions is ideal for engineers and analysts with little UNIX experience who want the power, productivity, and reliability of a UNIX workstation. Sun has not removed any of the traditional UNIX capabilities enjoyed by power users, it has just made them easier to access and use.

Sun has made UNIX much easier with Solaris Desktop Extensions, by adding the following capabilities:

- Sun has reorganized the CDE workspace to provide quick and easy access to directories and files, applications, the Internet and local intranet, and system management utilities.
- Sun has created graphical programs and utilities for 54 of the most frequently used and most powerful UNIX commands to make it easy for new users to navigate around a UNIX workstation and be productive immediately.
  - The powerful Find File search command has been integrated into the file manager so that users can find files and directories quickly.
  - Commands that users commonly use to manage and distribute files, such as `compress`, `archive`, and `encrypt`, are just a mouse click away.
  - A new Process Manager has been developed, which wraps a graphical user interface around the UNIX commands that allow users to identify, sort, suspend, and eliminate (kill) processes based upon process attributes such as CPU consumption, the time elapsed, and the process owner.
- Sun has added new desktop information applications.
  - The Personal Information Manager give users a single means to access e-mail, Web, and phone entries even though they may be in a separate database, so that a user can quickly find and contact other people.
  - The post-it note facility allows user to keep track of things to remember instead of using paper.
- A new graphical performance monitor helps the user see how the different system resources (such as CPU, disk or network access) are running. This new monitor makes it easier to understand which resources are affecting workstation performance so that the user can tune the performance for the particular applications that are being executed.
- CDE now allows the user to tailor the workspace more easily and extensively to reflect the user's preferences.
  - Users can create a "hot list" of their most frequently used applications, the Web sites that the user prefers to visit, the people with which the user collaborates, and the remote systems that the user logs into.
  - The menus are easy to customize—the user can just drag and drop menu items on to the workspace manager to sequence the menu items in any way.
- Communication and collaboration with PC users has become a necessity in most corporate environments. Users can take advantage of native Windows applications support using SoftWindows 95 or NTRIGUE (available separately).
- Sun has added several features to Solaris Desktop Extensions to make access to the Web easier.
  - The workspace is now Web-aware—the user can click on a URL from within the file manager, address manager, or from within an e-mail message to automatically launch a browser to that site. This feature decreases the need for personal bookmarks on the workspace. A user can store personal bookmarks on the toolbar and then launch a browser or search engine from the toolbar.
  - Sun also provides pre-set links to the Sun support and information Web sites.
  - Sun has also bundled Netscape Navigator™, the industry's most popular browser, to view Web pages.
  - Many common file formats are recognized within the file manager. Select a file (such as gif, PostScript™, or text) and the relevant application and file will launch automatically.

Licensing and Usage

All Sun system and system-board products include a Solaris license. The type of Solaris license(s) shipped with each platform reflects the way in which that system is most commonly used. Additional Solaris licenses are available to allow increased usage of the software.

Netra t 1125 servers come with a Solaris Server License.

Ordering Information

Sun™ Netra™ t 1125 Configurations

Part Number	System
N03-UEC1-9N-128AE	One 300-MHz UltraSPARC™-II processor with 2-MB Ecache, 128-MB DRAM, 9-GB internal hard drive
N03-UEC2-9N-512AE	Two 300-MHz UltraSPARC-II processors with 2-MB Ecache, 512-MB DRAM, 9-GB internal hard drive

Ordering Guidelines and Notes

- **Memory**
  - The Netra™ t 1125 server supports 2 GB of main memory. The DIMMs are of the same type as those used in the SPARCstation™ 20, Ultra™ 1, Ultra 2, and Ultra 30 systems. This architecture currently accepts 16-MB, 32-MB, 64-MB, or 128-MB memory modules.
  - The Netra t 1125 server can accommodate up to 16 DIMM modules in increments of four. DIMM modules within each set *must* be of the same type. DIMM module sets of four may be mixed.
- **SCSI**
  - The internal SCSI host controller operates in Fast-20 (UltraSCSI) mode by default. Installation of non-Fast-20 devices, although allowed, will decrease overall SCSI performance.
  - The total combined SCSI cable length must not exceed three meters for Fast/Wide operation or 1.5 meters for Fast-20 (UltraSCSI) operation.
  - To guarantee Fast-20 speeds on all devices on the bus, it is recommended that:
  - A maximum of two SPARCstorage™ UniPacks using Fast-20 cables be connected to the external connector.
  - All devices on the SCSI bus should be Fast-20 devices. (Non-Fast-20 devices may cause the internal devices to run at Fast/Wide speeds, but are supported.)

Options

Below is a comprehensive list of system expansion, networking, and multimedia options that are supported by Sun™ Netra™ t 1125 systems. Many of the options listed below have been retired and can no longer be ordered from Sun, but are shown here for reference purposes. Refer to the Sun Price Book and configuration guides for currently available option listings, configuration notes, and ordering information. When no maximum number is listed, refer to ordering or configuration notes for that option..

Part Number	Option description	Maximum number supported	Comments
Processors			
X1191A	UltraSPARC™-II 300-MHz 2-MB ecache	2	
Memory			
X7002A	64-MB, 60-ns SIMM memory expansion (2 x 32 MB)	8	These are all pairs of DIMM units.
X7003A	128-MB, 60-ns SIMM memory expansion (2 x 64 MB)	8	
X7004A	256-MB, 60-ns SIMM memory expansion (2 x 128 MB)	2	
X7022A	256-MB memory expansion (8.32 MB) SIMMs	2	
X7023A	1-GB memory expansion (8.128 MB) SIMMs	2	
Software			
X6905A	Netra t 1125 Alarms Card Software CD	1	
Rack Mount			
X6901A	19-inch kit for rack mounting	2	Set of two vertical flanges with instructions.
X6902A	23-inch kit for rack mounting	2	
X6903A	24-inch kit for rack mounting	2	
X6904A	600mm kit for rack mounting	2	
Manuals			
NETRA-T-DOC-ENG	Netra t 1125 Manual Set (English)	N/A	
Mass Storage—Internal			
X6520A	2.1-GB, 7200-rpm, Fast/Wide UltraSCSI disk	2	
X5214A	4.2-GB, 7200-rpm, Fast/Wide UltraSCSI disk	2	
X5229A	9.1-GB, 7200-rpm, Fast/Wide UltraSCSI disk	2	
X5232A	18.2-GB, 7200-rpm, Fast/Wide UltraSCSI disk		
X6166A	SunCD™ 32X CD-ROM drive	1	
X6280A	12–24-GB, 4mm DDS-3 tape drive	1	
X6256A	4-GB, 4mm DDS tape drive	1	
X6203A	14-GB, 8mm tape drive	1	
X6213A	8705DX, 7 GB	1	

Part Number	Option description	Maximum number supported	Comments
X6160A	4–8-GB SLR internal tape for Ultra 30™ or Ultra60	1	
Mass Storage—External			
X814A	5.0-GB, 8-mm tape backup drive, desktop storage module	2	
X827A	20-GB, 4-mm tape autoloader, desktop storage module	2	
X580A	535-MB Fast SCSI 2 desktop disk pack	4	
X545A	1.05-GB Fast SCSI-2 desktop disk pack	4	
X567A	2.1-GB Fast SCSI-2 desktop disk pack	4	
X737A	2.1 GB Fast SCSI-2 desktop disk pack	4	
X579A	SunCD 2PlusTM, desktop storage pack	2	
X660A	150-MB QIC tape drive, desktop storage pack	2	
X822A	5.0-GB, 4-mm tape drive, desktop storage pack	2	
X834A	10-GB, 8-mm backup tape drive, desktop storage module	2	
X844A	14.0-GB, 8-mm tape drive, desktop storage pack	2	
Mass Storage—Unipack			
The following UniPack options come with a 68–68 pin SCSI cable			
X5101A	1.05 GB, 7200-rpm Fast/Wide SCSI-2 disk UniPack	4	
X5151A	2.1-GB, 7200-rpm Fast/Wide SCSI-2 disk UniPack	4	
X5209A	4.2-GB, 7200-rpm Fast/Wide SCSI-2 disk UniPack (68–68 pin)	2	
X5253A	9.1-GB, 7200-rpm Fast/Wide SCSI-2 disk UniPack (68–68 pin)	2	
X6151A	SunCD™ 4x CD-ROM UniPack	1	
X6101A	2.5-GB QIC tape UniPack	2	
X6201A	14 GB, 8 mm tape UniPack	2	
X6208A	14 GB, 8 mm tape UniPack	2	
X6251A	5 GB, 4 mm tape UniPack	2	
X6157A	SunCD 12x CD-ROM UniPack	2	
X6261A	4–8 GB, 4 mm DDS-2 drive	2	
X6280A	12–24 GB, 4 mm DDS-3 tape drive	2	
X6230A	20–40 GB, 8 mm tape drive	2	
The following UniPack options come with a 50–68 pin SCSI cable:			

Part Number	Option description	Maximum number supported	Comments
X5102A	1.05 GB, 7200-rpm Fast/Wide SCSI-2 disk UniPack	4	NOTE: 68-pin is required on the Netra t 1125; these options supported if the correct cable is substituted
X5152A	2.1 GB, 7200-rpm Fast/Wide SCSI-2 disk UniPack	4	
X5204A	2.1 GB, 7200-rpm Fast/Wide SCSI-2 disk UniPack	4	
X5213A	4.2 GB, 7200-rpm Fast/Wide SCSI-2 disk UniPack	2	
X5254A	9.1 GB, 7200-rpm Fast/Wide SCSI-2 disk UniPack	2	
X6152A	SunCD 4x CD-ROM UniPack	1	
X6102A	2.5 GB QIC tape UniPack	2	
X6202A	14 GB, 8 mm tape UniPack	2	
X6209A	14 GB, 8 mm tape UniPack	2	
X6252A	5 GB, 4 mm tape UniPack	2	
X6158A	SunCD 12x CD-ROM UniPack	2	
X6262A	4–8 GB, 4 mm DDS-2 tape drive	2	
X6281A	2–24 GB, 4 mm DDS-3 tape drive	2	
X6231A	20–40 GB, 8 mm tape drive	2	
Mass Storage—Flexipack			
The following UniPack options come with a 68–68 pin SCSI cable:			
X6057A	DLT™ 4000	2	
X6060A	DLT 7000	2	
X6290A	72–144 GB, 4 mm DDS3 autoloader tape FlexiPack	2	
X6284A	12–24 GB, 4 mm DDS3 tape FlexiPack	2	
X6264A	4–8 GB, 4 mm DDS3 tape FlexiPack	2	
X6232A	20–40 GB, 8 mm tape FlexiPack	2	
X6210A	14 GB, 8 mm tape FlexiPack	2	
X6159A	SunCD 12x CD-ROM FlexiPack	2	
The following UniPack options come with a 50–68 pin SCSI cable:			
X6058A	DLT 4000	2	NOTE: 68-pin is required on the Netra t 1125; these options are supported if the correct cable is substituted
X6061A	DLT 7000	2	
X6291A	72–144 GB, 4 mm DDS3 autoloader tape FlexiPack	2	
X6285A	12–24 GB, 4 mm DDS3 tape FlexiPack	2	
X6265A	4–8 GB, 4 mm DDS3 tape FlexiPack	2	
X6233A	20–40 GB, 8 mm tape FlexiPack	2	
X6211A	14 GB, 8 mm tape FlexiPack	2	
X6150A	SunCD 12x CD-ROM FlexiPack	2	

Part Number	Option description	Maximum number supported	Comments
Mass Storage—Multipack			
X5511A	4.2 GB (2 x 2.1 GB), 7200-rpm Fast/Wide SCSI-2 MultiPack	1	
X5512A	12.6 GB (6 x 2.1 GB), 7200-rpm Fast/Wide SCSI-2 MultiPack	1	
X5513A	25.2 GB (12 x 2.1 GB), 7200-rpm Fast/Wide SCSI-2 MultiPack	1	
X5514A	8.4 GB (2 x 4.2 GB), 7200-rpm Fast/Wide SCSI-2 MultiPack	1	
X5515A	25.2 GB (6 x 4.2 GB), 7200-rpm Fast/Wide SCSI-2 MultiPack	1	
X5516A	50.4 GB (12 x 4.2 GB), 7200-rpm Fast/Wide SCSI-2 MultiPack	1	
X5501A	8.4-GB (2 x 4.2-GB), 7200-rpm, Fast/Wide SCSI 2 MultiPack	1	
X5502A	16.8-GB (4 x 4.2-GB), 7200-rpm, Fast/Wide SCSI 2 MultiPack	1	
X5503A	25.2-GB (6 x 4.2-GB), 7200-rpm, Fast/Wide SCSI 2 MultiPack	1	
X5504A	18.2-GB (2 x 9.1-GB), 7200-rpm, Fast/Wide SCSI 2 MultiPack	1	
X5505A	36.4-GB (4 x 9.1-GB), 7200-rpm, Fast/Wide SCSI 2 MultiPack	1	
X5506A	54.6-GB (6 x 9.1-GB), 7200-rpm, Fast/Wide SCSI 2 MultiPack	1	
X6527A	18.2-GB MultiPack (2 x 9.1 GB), 7200-rpm, UltraSCSI	1	FAST-20 Mode
X6528A	36.4-GB MultiPack (4 x 9.1 GB), 7200-rpm, UltraSCSI	1	FAST-20 Mode
X6529A	18.2-GB MultiPack (6 x 9.1 GB), 7200-rpm, UltraSCSI	1	FAST-20 Mode
Mass Storage—SPARCstorage™			
X6227A	SPARCstorage Library Model 8/140, 140 GB 8mm tower unit	1	
X849A	SPARCstorage Library Model 8/140, 140 GB 8mm stackable unit	1	
X867A	SPARCstorage Library Model 8/140, 140 GB 8mm two drives and barcode reader, tower unit	1	
X869X	SPARCstorage Library Model 8/140, 140 GB 8mm two drives and barcode reader, stackable unit	1	
X6225A	SPARCstorage Library Model 8/400, 400-GB, 8mm, stackable unit and two drives, barcode reader	1	

Part Number	Option description	Maximum number supported	Comments
PCI Expansion Cards			
X1032A	10/100BASE-T Ethernet with SunPCI UltraSCSI	3	
X1033A	10/100 BASE-T with MII PCI Adapter (Fresh Choice Light)	3	
X1034A	PCI Quad Fast Ethernet Controller PCI Adapter	3	
X1039A	SunLink™ Token Ring Interface/PCI Adapter	4	Universal
X1040A	High-speed Serial Interface PCI Adapter (HSI) 1 port	3	
X1041A	Serial Asynchronous Interface (SAI) PCI adapter 8 ports	3	Universal
X1035A	SunFDDI™ single-attach PCI Adapter (SAS/5.0)	4	
X1036A	SunFDDI dual-attach PCI Adapter (DAS/5.0)	3	
X1044A	Gigabit Ethernet Controller PCI Adapter	3	
X1066A	SunATM™/P-155 Multimode Fiber	3	
Other Options			
X901A	0.8-meter Wide-to-Narrow 68–68-pin UltraSCSI	1	
X902A	2.0-meter Wide-to-Narrow 68–68-pin UltraSCSI	1	
X903A	1.2-meter Wide-to-Narrow 68–68-pin SCSI adapter cable	1	
X904A	2.0-meter Wide-to-Narrow 68–68-pin SCSI adapter cable	1	
X907A	Optional power cable, CPU to monitor, 1.5 meter	1	
X908A	Optional power cable, CPU to monitor, 2.5 meter	1	
X467A	MII-AUI Converter	1	

Configuration Guidelines

- **Processor**
  – The Netra t 1125 server can be fitted with a maximum of two 300- or 360-MHz UltraSPARC processor modules
- **Memory**
  – All SIMMs supported in Sun Ultra 60 desktop systems are also supported in the SunNetra t 1125 system
  – The Sun Netra t 1125system requires memory to be installed in like groups of four per bank. If additional memory is required, order Netra t 1125 or Sun Ultra 60 memory X-options to obtain additional like SIMMs
- **Disk**
  – Internal single-connector UltraSCSI disks from the Sun Ultra 60 are supported in the Sun Netra t 1125 system
- **AUI**
  – The Sun Netra t 1125 system has an MII connector in place of an AUI connector. Customers need to order an MII-AUI adapter if the environment requires connection to an external transceiver through an AUI connection (see the *Options* section)
- **SCSI**
  – The Sun Netra t 1125 server has an UltraSCSI connector (68-pin). Customers need to order an external SCSI adapter cable if external narrow SCSI devices are to be connected to the system (see the *Options* section)
- **CD-ROM and Tape Devices**
  – The internal CD-ROM and tape devices from Sun Ultra 60 systems are fully supported by the Sun Netra t 1125 system
  – No floppy disk support

Service and Support

SunSpectrum℠ 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. SunSpectrum 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 today take advantage of the SunSpectrum program, underscoring the value it represents. Customers should check with their local Sun™ Enterprise™ Services representative for program/feature variance and availability in their area.

FEATURE	SUNSPECTRUM℠ PLATINUM℠ Mission-Critical Support	SUNSPECTRUM℠ GOLD℠ Business-Critical Support	SUNSPECTRUM℠ SILVER℠ Systems Support	SUNSPECTRUM℠ BRONZE℠ Self Support
Systems Features				
Systems approach coverage	Yes	Yes	Yes	Yes
System availability guarantee	Customized	No	No	No
Account Support Features				
Service account management team	Yes	No	No	No
Personal technical account support	Yes	Yes	No	No
Account support plan	Yes	Yes	No	No
Software release planning	Yes	No	No	No
On-site account reviews	Monthly	Semi-annual	No	No
Site activity log	Yes	Yes	No	No
Coverage / Response Time				
Standard telephone coverage hours	7 day/24 hour	7 day/24 hour	8 a.m.–8 p.m., Monday–Friday	8 a.m.–5 p.m., Monday–Friday
Standard on-site coverage hours	7 day/24 hour	8 a.m.–8 p.m., Monday–Friday	8 a.m.–5 p.m., Monday–Friday	N/A
7-day/24-hour telephone coverage	Yes	Yes	Option	No
7-day/24-hour on-site coverage	Yes	Option	Option	N/A
Customer-defined priority setting	Yes	Yes	Yes	Option
– Urgent (phone/on-site)	Live transfer/ 2 hour	Live transfer/ 4 hour	Live transfer/ 4 hour	4 hour / N/A
– Serious (phone/on-site)	Live transfer/ 4 hour	2 hour/next day	2 hour/next day	4 hour / N/A
– Not critical (phone/on-site)	Live transfer/ customer convenience	4 hour/ customer convenience	4 hour/ customer convenience	4 hour / N/A
Additional contacts	Option	Option	Option	Option

FEATURE	SUNSPECTRUM℠ PLATINUM℠ Mission-Critical Support	SUNSPECTRUM℠ GOLD℠ Business-Critical Support	SUNSPECTRUM℠ SILVER℠ Systems Support	SUNSPECTRUM℠ BRONZE℠ Self Support
Enhanced Support Features				
Mission-critical support team	Yes	Yes	No	No
Sun Vendor Integration Program (SunVIP™)	Yes	Yes	No	No
Software patch management assistance	Yes	No	No	No
Field change order (FCO) management assistance	Yes	No	No	No
Remote Systems Diagnostics				
Remote dial-in analysis	Yes	Yes	Yes	Yes
Remote systems monitoring	Yes	Yes	No	No
Remote predictive failure reporting	Yes	Yes	No	No
Software Enhancements and Maintenance Releases				
Solaris enhancement releases	Yes	Yes	Yes	Yes
Patches and maintenance releases	Yes	Yes	Yes	Yes
Sun unbundled software enhancements	Option	Option	Option	Option
Internet and CD-ROM Support Tools				
SunSolve™ license	Yes	Yes	Yes	Yes
SunSolve EarlyNotifier℠ Service	Yes	Yes	Yes	Yes

Glossary

CO	Central Office. Telephone company facility where subscribers' lines are joined to switching equipment for connecting other subscribers to each other, locally and long distance.
CPU	Central Processing Unit. The part of a computer which performs the logic, computational and decision-making functions. It interprets and executes instructions as it receives them.
HLR	Home Location Register. A permanent database used in Global System for Mobile Communications (GSM) to identify a subscriber and to contain subscriber data related to features and services.
I/O Slots	Input/Output Card Slots
NEBS	Network Equipment Building System. A set of standards defined by Bellcore for equipment to be deployed in telecom Central Office environments.
NFS™	Network File System. One of many distributed-file-system protocols that allow a computer on a network to use the files and peripherals of another networked computer as if they were local.
OSP	Operator Service Provider. A new breed of long distance phone company. It handles operator-assisted calls, in particular Credit Card, Collect, Third-Party Billed and Person-to-Person.
RBOC	Regional Bell Operating Company
SIMM	Single In line Memory Module. A form of chip packaging in which leads (pins) are arranged in a single row protruding from the chip.
UNIX®	An immensely powerful and complex operating environment for computers for running data processing and for running telephone systems.
UPA	Ultra™ Port Architecture
VIS™	Visual Instruction Set
VLR	Visitors' Location Register. A local database to a Mobile Services Switching Center (MSC) for registering visiting mobile station user

Materials Abstract

All materials are available on SunWIN, except where noted otherwise.

Collateral	Description	Purpose	Distribution	Token # or Comac order #
PowerPack				
– *Just the Facts*	Reference Guide	Sales Tools	SunWIN, Reseller web	91976
– *Customer Presentation*	Slides with Notes	Sales Tool	SunWIN, Reseller web	TBD
References				
– *Sun Product Intro*	Introduction e-mail	Sales Tool	SunWIN, E-mail Reseller web	92306
– *Quick Reference Card*	Quick Reference material	Sales Tool	SunWIN, Reseller web	75091
Product Literature				
– *Netra™ t 1125 Datasheet*	Datasheet	Sales Tool	SunWIN, Reseller web	91000
– *Ultra™ 60 Architecture White Paper*	Technical Brief	Sales Tool	SunWIN, Reseller web	75264
– *Sun and the PCI Bus, Transition Brief*	Technical Brief	Sales Tool	SunWIN, Reseller web	66734
– *The PCI Bus and Sun Ultra System Technical Brief*	Technical Brief	Sales Tool	SunWIN, Reseller web	66738
– *The UltraSPARC Processor Architecture Paper*	Technical Brief	Sales Tool	SunWIN, Reseller web	49231
– *SunFlash*		Sales and Reseller notification	SunWIN, E-mail Reseller	TBD
– *Press Presentation*	Slides	Press Brief	SunWIN	TBD
– *Sales Guide*	Reference Guide	Sales Tool	SunWIN, Reseller web	TBD
– *Netra t 1125 Server: Technical Information Quickstart*	Reference Guide	Sales Tool	SunWIN, Reseller web	91757
Web Sites				
– *External*	`http://www.sun.com/netrat`			