

# Netra™ t 1400 and 1405 Servers

## Just the Facts

[\(SunWIN #111538\)](#)



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**Figure 1.** The Netra™ t 1400 or 1405 server

## Introduction

Deregulation and privatization are causing unprecedented competition in the worldwide telecommunications market. To retain or attract subscribers in this climate of fierce competition, service providers must introduce new, more sophisticated, and user-friendly services at an accelerated pace while not compromising traditional Telecom service quality. This pressure has prompted many telecommunication service providers to choose Internet protocol (IP)-based networks as the foundation for many of their value-added services. As a result, they can introduce new services at a significantly reduced operating cost while still delivering classic circuit-switched type quality and availability. This growth is fueling the investment in systems, particularly “carrier-grade” computer systems, which are a requirement of this sector.

Network equipment providers (NEPs) are faced with similar challenges. A general trend in the equipment provider market has become apparent—NEPs no longer want to spend precious resources trying to develop, build, and support proprietary computing solutions. In the past there was a little choice, as the stringent Telecom requirements could not be met by the commercial computing sector. So NEPs were forced to build their own systems to meet central office requirements. Today, it is possible for NEPs to ally with computer platform vendors, and Sun has led the way with systems that meet the stringent requirements of the market, measured by the ability to achieve Telcordia Network Equipment Building Systems (NEBS) tests.

The economy seems to be undergoing a wholesale rejuvenation. Businesses are re-inventing themselves. The value derived from connecting to remote offices, customers, suppliers, and beyond via Internet technology is being encompassed by many organizations. So the Internet is being used more and more as a vehicle for business commerce and communication (e-commerce, VoIP, e-mail, home sites, and so on) to deliver applications anywhere, at anytime, on any device. As businesses come to rely on technology for these new services, they will require systems to be more robust and reliable, and many will look to leverage equipment that has previously been in Telecom and service provider domains to achieve this reliability.



The Netra™ t “carrier-grade” product family has already been very well received in the market place. With this product family, Sun is recognized as a supplier of a cost-effective, compact, high-performance, carrier-grade computing platform that meets the stringent environmental needs for deployment in Telecom and Internet infrastructures. Netra t 1400 and 1405 servers will expand this product offering giving the right answer for high-performance, high-volume service points. The Netra t 1400 and 1405 servers are part of the network systems family of simplex multiprocessor (SMP), carrier-grade, packaged servers based on standard Sun™ technology. The Netra t 1400 and 1405 servers are NEBS-compliant and are currently undergoing testing to meet all relevant requirements of the Telcordia NEBS standards to Level 3 (mission critical).

## Product Overview

The Netra t 1400 and 1405 carrier-grade systems are designed to meet the rigorous requirements of the rapidly growing telecommunications and service provider network infrastructure. Their reliability features include the following:

- Ability to operate in potentially hostile environmental conditions (designed for NEBS Level 3)
- Compact footprint and minimal height
- Ruggedized rackmountable chassis built to fit in Telecom racking (19 inches deep)
- DC and AC power supply options
- Alarms and high-availability options

These specific market place needs are blended with the leading capabilities that Sun has built into its highly successful commercial servers, including the following:

- Advanced open, robust Solaris™ Operating Environment
- Attractive price/performance ratio
- High-quality manufacturing
- Global services

Netra t 1400 and 1405 systems provide carrier-grade server performance, in a low-profile, rackmountable enclosure that is NEBS compliant. The systems offer the same functionality and upgradability, but are differentiated by their power supply:

- The Netra t 1400 server can operate in a -48/60V DC environment, which is found in Telecom equipment areas, especially in the central office (CO).
- The Netra t 1405 server operates in a 110/240V AC environment, which is more typical situation in computing machine rooms and offices. This server is ideal for the ISP market.

The primary capability of the Netra t 1400 and 1405 systems is that they can support up to four 440-MHz UltraSPARC™-II processors in a carrier-grade package, and they offer a comprehensive list configuration options and features including:

- Lights out management (LOM)/Telecom RAS management (alarms card with relay output, LED panel, and ports for remote access) that provide monitoring of the power inputs, fan failure detection, remote reset, programmable watchdog, and user-programmable alarm
- Up to 4-GB memory
- Up to 144-GB internal disk (between one and four hot-pluggable standard UltraSCSI disks)
- Four PCI cards
- DVD-ROM
- DAT drives



- Ethernet (TP connectors), external UltraSCSI, and two serial ports
- Parallel port
- Dual redundant (or n+1) hot-swap power supplies in AC and -48/60 V DC variant

Netra t 1400 and 1405 servers are based on technology developed for the Ultra 80 system, incorporating standard Sun UltraSPARC-II technology and standard storage. By using these standard, high-volume components as building blocks for the Netra t servers, Sun is leveraging the significant commercial and operational success of this technology. Netra t 1400 and 1405 servers run the standard Solaris Operating Environment, which makes them compatible with other Sun systems. This allows customers to develop applications on a commercial workstation or server and then to deploy them into the network infrastructure without modification.

An alarm facility is provided with both visible warning lights and alarm output signals that can be interfaced to displays at the central office or network management software. This ability meets Telecom central office alarm requirements.

The Netra t 1400 and 1405 servers are competitively priced to gain market share in this growing market.

### The Netra t 1400 and 1405 Systems at a Glance

Product Specifications	Netra t 1400 and 1405 Servers
<b>Dimensions and Weight</b> <ul style="list-style-type: none"> <li>• Height</li> <li>• Width</li> <li>• Depth</li> <li>• Weight</li> </ul>	<ul style="list-style-type: none"> <li>• 264 mm (10.4 inch/6U)</li> <li>• 431.8 mm (17 inch)</li> <li>• 504.7 mm (19.9 inch)</li> <li>• 37 kg (81.8 lbs.) (unpacked but fully configured)</li> </ul>
<b>CPU</b> <ul style="list-style-type: none"> <li>• Processor type</li> <li>• Clock rate</li> <li>• No of CPUs supported</li> <li>• Cache on module</li> </ul>	<ul style="list-style-type: none"> <li>• UltraSPARC-II</li> <li>• 440 MHz</li> <li>• 1 to 4</li> <li>• 4-MB Ecache</li> </ul>
<b>Memory</b> <ul style="list-style-type: none"> <li>• Minimum to maximum amount</li> <li>• Memory type</li> <li>• DIMM sizes</li> <li>• DRAM speed</li> <li>• Bus width</li> </ul>	<ul style="list-style-type: none"> <li>• 256 MB to 4 GB</li> <li>• ECC</li> <li>• 64, 512 MB</li> <li>• 60 ns</li> <li>• 2*288 bits</li> </ul>
<b>Storage (Internal)</b> <ul style="list-style-type: none"> <li>• Bus</li> <li>• Maximum internal</li> <li>• Number of bays</li> </ul>	<ul style="list-style-type: none"> <li>• 40 MB/sec. UltraSCSI</li> <li>• 72.8 GB</li> <li>• Four 1- or 1.6-inch drive bays</li> </ul>

Product Specifications	Netra t 1400 and 1405 Servers
<b>I/O Architecture</b> <ul style="list-style-type: none"> <li>• PCI bus</li> <li>• Serial ports</li> <li>• Parallel port</li> <li>• SCSI</li> </ul>	<ul style="list-style-type: none"> <li>• 4 PCI slots: 2 @ 33 MHz, 32/64-bit slots, 5V/3.3V supply, 5V signalling 1 @ 33 MHz, 32-bit slots, 5V/3.3V supply, 5V signalling 1 @ 33/66 MHz, 64-bit slots, 5V/3.3V supply, 3.3V signalling</li> <li>• Two synch (76.8 Kbaud)/synch (64 Kbaud)</li> <li>• DB25</li> <li>• 68 pin</li> </ul>
<b>Networking Ports</b>	<ul style="list-style-type: none"> <li>• TP Ethernet 100BASE-T/10BASE-T</li> </ul>
<b>Backup and Distribution</b> <ul style="list-style-type: none"> <li>• Internal</li> <li>• External</li> </ul>	<ul style="list-style-type: none"> <li>• Optional 10X SunDVD™ drive Optional DAT DDS-3 12–24 GB</li> <li>• External SCSI interface allows connection of any compatible device</li> </ul>
<b>Operating Environment</b>	<ul style="list-style-type: none"> <li>• Solaris 7 or Solaris 8</li> </ul>

## Product Family Placement

The Netra t 1400 and 1405 servers are complementary to the Netra t 1120 and 1125 servers, extending the carrier-grade product family and market offering. They offer improved server performance, as well as increased processor, memory, PCI, and disk capability, which is above what is already offered with the Netra t 1120 and 1125 servers.

The only difference between the Netra t 1400 and Netra t 1405 servers is in the power supply unit (PSU). The Netra t 1400 server is a DC-powered system while the Netra t 1405 server is an AC-powered system. So the Netra t 1400 server is targeted for Telecom markets, while the Netra t 1405 server is targeted for ISP markets.

The Netra t 1400 and 1405 servers offer a range of performance options from one to four 440-MHz UltraSPARC-II processors. As the Netra t product family uses the versatile Solaris Operating Environment, one can choose any system combination to create a configuration that meets the customers requirements. Sun's Netra t family is unique in offering a range of choices of ready to run, carrier-grade compute platforms designed for Telcordia NEBS Level 3.

## Key Messages

The Netra t 1400 and 1405 servers are carrier-grade systems suitable for deployment within the Telecom and ISP infrastructure providing high processor performance and growth potential. Features include the following:

- High performance (up to four processor support)
- Rackmountable
- Carrier-grade, ruggedized design (NEBS Level 3 compliant) for central offices and confidence
- Alarms
- Lights out management (LOM) for remote power on/off, programmable alarms, and watchdog
- Enhanced reliability, availability, and serviceability (RAS)
- Remote management
- AC/DC hot-swap N+1 redundant PSU (power supplier unit) option



- Up to four easily accessible disk drives, giving 144 GB of internal storage
- External storage expansion
- External PCI expansion
- Standard Solaris Operating Environment simplifies system administration and training, and decreases associated costs
- Standard PCI card support
- Full SunSpectrum<sup>SM</sup> program worldwide support

## Availability

The Netra t 1400 and 1405 systems will be available for ordering on an Assemble to Order (ATO) basis and fixed configuration basis at the end of November 1999.

## Target Users

The Netra t 1400 and 1405 are carrier-grade servers that have been designed to be deployed as infrastructure devices, within telecommunication networks. They offer improved processor density and high performance for mission-critical applications. The target users are discussed below.

- **Telecommunications**

Systems implemented within telecommunications environments must be highly reliable and capable of withstanding high climatic/environmental extremes, in order to provide maximum equipment operability within the network facility environment. In the central office sector, network infrastructure equipment locations are typically implemented into racking systems to take full advantage of limited space and to simplify installation and service. Also within central office locations, DC power may be the only power supply available for equipment.

The Netra t 1400 and 1405 servers provide a high-performance, compact server platform that is truly rackmountable. In addition the systems are designed for NEBS Level 3 (mission-critical) compliance, and offer a DC power variant, making them ideal for this sector. The Netra t 1400 and 1405 servers are currently undergoing testing for Telcordia NEBS Level 3 (mission-critical) certification which indicates an equipment's capability to meet demanding conditions, and is a mandatory requirement for systems being implemented in most central office environments, and in many other telecommunication equipment locations.

- **Network equipment providers (NEPs)**

Traditionally NEPs have developed their own computing platforms; however they are increasing their focus on becoming solution providers (SPs) or system integrators (SIs), which allows them to take advantage of their core strengths. They are now looking for external suppliers to provide the computing elements of their network solutions. The Netra t 1400 and 1405 servers offer a cost-effective solution to NEPs, as they offer compact computing, based on standard, open-computing technology in rackmountable housing that meets the special needs of the Telecom market.

Applications in the Telecom market include:

- **Wireline**—intelligent peripherals, adjunct processors, service nodes, enhanced service processors, service control point, and voice messaging
- **Wireless**—home location registers, visitor location registers, base station manager, base station controller, prepaid application, and authentication center.



- **Internet service providers (ISPs)**

The ever-increasing demand for high-quality services, combined with the convergence of multiple services onto a common backbone network (convergence of Telecom and ISP infrastructure), is prompting service providers to build more robust, Telecom-like networks that employ carrier-grade, rackmounted, high-performance systems. Improved reliability and high performance density are highly attractive to ISPs who are experiencing rapid growth in physical equipment needs, and who have a business need to contain real estate costs. The Solaris Operating Environment is also highly attractive to this sector, as it is widely recognized as a leader in the market in terms of reliability and scalability.

Applications in the Internet market include:

- **Subscriber services**—mail, news, http hosting, and e-commerce server
- **Network services**—proxy/cache servers, policy management, directory services, and VoiP Gateway servers
- **Network management**—load balancing and failover services

Target customers include UUNet, Cisco, and AT&T Worldnet

- **Traditional commercial computing environment**

The increased reliance of organizations on computing means that any break in service may cause significant problems. Many organizations are now looking at other contributing factors to service breaks (for example, environmental extremes). Such conditions may occur because environmental control systems fail, or their implementation can not be justified for rare or unpredictable extremes. The Netra t 1405 server offers a standard Sun computing environment designed for NEBS Level 3 compliance, which is an attractive proposition in some parts of this sector, as it allows the system to continue to perform in extreme environmental conditions.

**Installation examples**—equatorial locations, premises with inadequate or no air-conditioning, and Zone 4 earthquake\*

Furthermore, because the Netra t 1400 and 1405 servers are from Sun, they provide the advantage of the Solaris Operating Environment with binary compatibility across all platforms from development to deployment, now established as the only viable long-term UNIX<sup>®</sup> platform with all the reliability advantages over Microsoft Window NT.

\* Regarding earthquake zone compliance, as stated on the NEBS Level 3 standard, the compliance zone is Earthquake Zone 4. Zone 4 is the area of the globe, including California, that is susceptible to the worst earthquake. The equipment must be fully operational after the earthquake and sustain no physical damage (other than cosmetic) that might impact its operation. The equipment can fail during the earthquake but must recover state without manual intervention.





## Target Markets

Below is a view of the industry and key features highlighted for The Netra t 1400 and 1405 servers.

Industry/Customer	Key Features to Highlight
Telecom central office/Wireline	Carrier-grade (NEBS Level 3 compliant), ruggedized rack (several slide option), RAS (hot-swap PSUs, LOM), scalable capacity with high performance, customization, less than 20 inches
ISP	Compact rackmountable, high performance and RAS (hot-swap PSUs, LOM), ruggedized assurance, UNIX platform reliability, scalable capacity with high throughput, fast I/O in support of multiple transaction
NEP	Carrier-grade (NEBS Level 3 compliant), ruggedized assurance, UNIX platform reliability, scalable capacity with RAS support, high performance, customization
Wireless	Carrier-grade (NEBS Level 3 compliant), UNIX platform reliability, quick time to market, compact and quick rackmount
Commercial computing environment	Ability to operate in widely varying environmental condition, UNIX platform reliability, fast I/O for business-critical application, HA

# Selling Highlights

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## Market Value Proposition

The Netra™ t 1400 and 1405 systems are carrier-grade servers suitable for deployment within the Telecom and ISP infrastructure. The Netra t 1400 and 1405 servers enhanced RAS features meets the Telecom and ISP industry requirements for high reliability and manageability. The Netra t 1400 and 1405 are NEBS Level 3 (mission-critical) compliant, a requirement for installation in many telecommunications environments, and a desirable attribute for many other network infrastructure deployments (similar systems from other major manufacturers are not compliant).

The Netra t 1400 and 1405 servers can help Telecom and SPs implement a true service-driven network—a network built to make the services that customers want available anytime and anywhere.

## Compatibility

The Netra t 1400 and 1405 servers run the Solaris™ 2.6 and 7 Operating Environment. Because they are fully compatible with all the 32-bit application from the previous Solaris Operating Environment version and as a member of the UltraSPARC™ family of CPUs, these servers have full binary compatibility.

For more details of Sun Netra products or products from third-party vendors, visit the following web sites:

The Sun internal web site is at <http://vsp.eng>

The Sun Reseller web site is at <http://reseller.sun.com>

The Sun external web site is at <http://www.sun.com/products-n-solutions/hw/networking/>

# Enabling Technology

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## Technology Overview

With the Netra™ t 1400 and 1405 servers, customers get the robust UltraSPARC™ processor and Solaris Operating Environment in a package designed to meet the rigorous equipment guidelines and to withstand the operational rigors of a Telecom central office environment. They get a compact, modular, rackmounted server that offers the highest computing density per cubic foot. And they get a *workhorse* server whose platform is identical to Sun's acclaimed commercial servers, so that applications developed on any Sun platform can be deployed on a Netra t 1400 or Netra t 1405 server, as is, without porting.

# System Architecture

The Netra™ t 1400 and 1405 rackmount systems are designed for balanced system performance in applications, providing excellent I/O, memory, and processing capabilities. The individual system elements, UltraSPARC™-II processor(s), high-speed memory bus, PCI bus subsystem, UltraSCSI, and Fast Ethernet are interconnected using Ultra™ port architecture (UPA) which accelerates every part of the sequence an application goes through. This design makes it possible to build more flexible, compact, and modular applications.

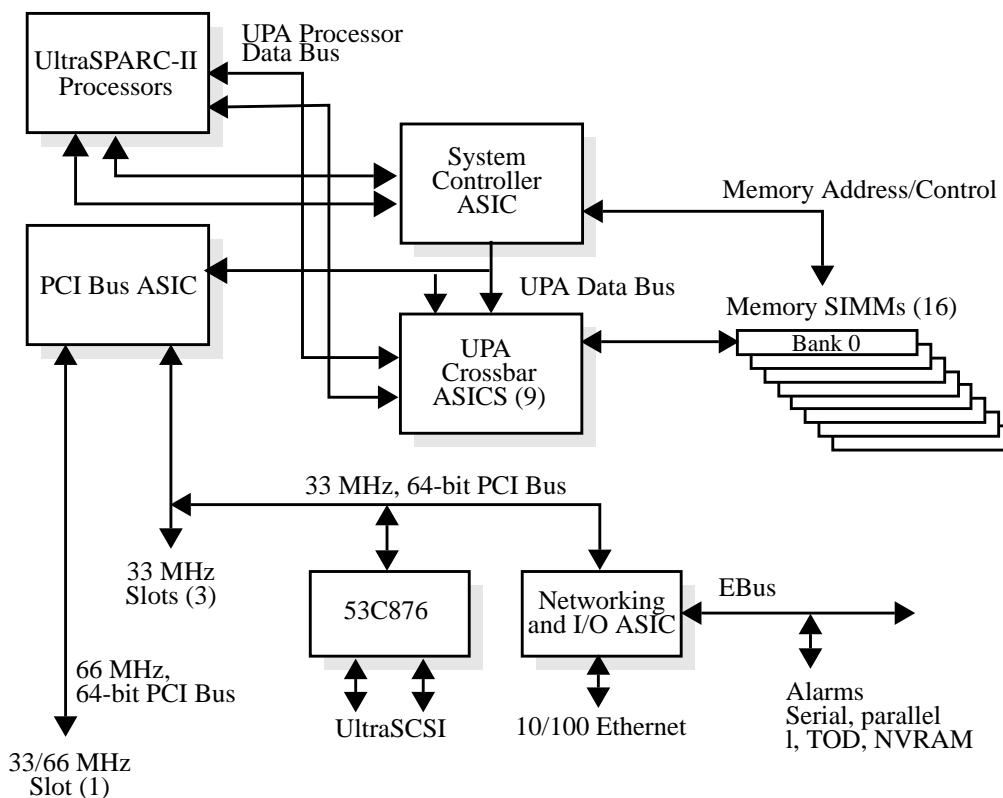


Figure 2. Architecture of the Netra t 1400 and 1405 systems

## Telecommunications Packaging

The Netra t 1400 and 1405 servers were designed from the outset to meet the stringent requirements of the Telecommunications industry. The Netra t 1400 and 1405 servers are NEBS compliant and are currently undergoing testing to meet all relevant requirements of the Telcordia NEBS standards to Level 3 (mission-critical). The certification process includes tests to meet many safety, immunity, temperature, radio frequency, and electromagnetic standards.

Also to reflect typical operational and infrastructure requirements in a telecommunications environment the Netra t 1400 and 1405 servers have:

- An alarms system for easy integration into central office equipment
- -48/60V DC power option (Netra t 1400 server) for central office deployment
- A range of rackmount options (19 inch, 23 inch and 600 mm)
- The servers are less than 19 inches deep, allowing them to fit into the racking systems most widely deployed in the telecommunications market

## Power Supply Flexibility

Both the Netra t 1400 and Netra t 1405 servers have 2+1 PSU (power supply unit) redundant configuration, are hot-swappable and can be removed from the rear of the system without having to unplug any cables. Each PSU providing an integral 330-Watt DC, for a system total of 660-Watt DC.

The Telecom central office environment usually requires equipment to operate on -48V DC.

The Netra t 1400 server has an integral DC power supply that will work at -48V DC nominal, for standard central office requirement, and -60V DC nominal for Germany. This removes the need and associated cost often associated with having a NEBS rackmountable DC to AC converter. The power supply has dual input so power can be supplied from two independent sources.

The Netra t 1405 server has an integral 100–240V AC power supply able to operate at between 47 and 63 Hz, this wide operational tolerance allows it to be used in the majority of AC power environments.

## Rackmount

The chassis is ruggedized to meet the NEBS requirements and is ETSI compliant. It is designed to be rackmounted horizontally into 19-inch, 23-inch, or 600-mm racks with the appropriate kits (19-inch rackmount kit is included with ship kit; other sizes are available as X-options. A rack slide adapter for 19inch racks is available as an X-Option). Location points for industry-standard rails have been added, so customers have numerous possibilities for rackmounting the systems. Key plastic parts have been designed so they can be easily removed and replaced in the field, to facilitate service and to make OEM branding as simple as possible.

## Installation and Serviceability

The system is serviceable from the front, via the front panel that contains the air filter, providing access to the disk drives, CD-ROM drive, and DAT tape. The CD-ROM and DAT tape drives are mounted in a cradle that allows for easy installation and removal. Cables are all connected at the rear of the system. This means that systems can be rackmounted with no vertical gaps, the only reason to remove the systems from a rack is for repair or upgrade (e.g., with processor, memory, or PCI cards). Memory, processors, I/O, and fans are directly accessible through the top cover.

The air flows through the system from front to the rear where it is expelled. Four high performance, variable-speed fans assist with this process to help ensure that the NEBS temperature requirements (short-term operation at 55 Celsius) can be met without the need for non-standard processors, disks, or memory components in the system. The system will continue to operate (at least to 40 degrees) if one of the main system fans fails. The hinged plastic fascia in the front of the machine contains an air filter (supplied with the system). The filter can easily be replaced by the customer by opening the plastic fascia.

**Note:** *Netra t 1400 and 1405 servers have a depth of less than 19 inches, allowing them to fit into central office racking systems. Many competitors products cannot be mounted in CO racks as they are too deep.*



## Alarms Card

One of the key features of the system is the inclusion of an alarms card. This is located on the motherboard and has a DB15 male output at the rear of the system. It requires additional software driver 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 fans) and can alert operators to system conditions through an LED on the system front panel and through the connector, which can interface to a remote console or other application.

The system can generate up to three alarm conditions, all of them being user configurable. Also, the alarms card allows the system to be reset remotely if the system hangs.

The alarms are controlled by the driver/utility software so the customer can specify when to set and reset them. The customer can also write customized software to perform this function. For example, some users might choose to set an alarm if a key application crashes.

## Lights Out Management (LOM)

Lights-Out Management (LOM) is a remote system management mechanism that allows control of remotely deployed servers (servers deployed in “lights-out” environments). LOM allows you to power-on, power-off, and power-cycle the Netra t 1400/1405 server remotely. LOM allows you to monitor component status (fans, power supply, and temperatures) even when the Solaris™ Operating Environment software is not running.

LOM is provided through the LOMlite device, which also provides remote management of the system over a serial connection. While the system is running, LOMlite performs event reporting via the Solaris Operating Environment.

LOMlite monitors the status of the PSUs and fans in the system. It provides a fault LED and three alarms to notify the operator of events or failures. It also provides an automatic server restart (ASR), which can reset the system in the event of a lockup. The current status of the system can be displayed by using either the serial command interface or the UNIX® driver. LOMlite also provides the capability to power up the system, to return it to standby mode, and to reset the host from the serial command interface. Events such as fan failures and alarm state changes are stored in an event log of ten events. The oldest fatal event is stored separately as the most likely cause of subsequent failures. To avoid filling the event log with repeated failures from a given source, only the first failure from any given source is stored. Once the operator has cleared the fault, monitoring of the failed device is re-enabled. This is performed either by restoring standby power to the system (if the system was powered off to repair the fault) or by issuing a check command at the LOMlite prompt. Re-enabling monitoring of a device also clears the error indication on the fault LED. All device state changes are reported via the interface to the Solaris Operating Environment driver, which has more resources available for storing such events.

## UltraSPARC Processor

The UltraSPARC-II processor is a reliable and proven second generation of 64-bit UltraSPARC chip. In the Netra t 1400 and 1405 servers, the processors are individually mounted on 4 x 6-inch, field-installable module cards along with the associated UPA data buffers and high-speed SRAM external cache memory. These modules are standard UltraSPARC-II modules. This modular design facilitates easy system processor upgrades.



## UPA System Bus

The Netra t 1400 and 1405 servers' processors, memory, and I/O subsystems are interconnected by the high-speed Ultra port architecture (UPA) crossbar datapath. The processor datapath is 144 bits wide, with 128 bits for data and 16 bits for error correcting code (ECC). The UPA clocks at 112.5 MHz with the 440-MHz processor installed. The processor datapath transfer 16 bytes of data in parallel each clock cycle, giving a maximum transfer rate of 1.8 GB per second. The UPA data path that supports the 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 paths for high data throughput.

## Memory

The Netra t 1400 and 1405 servers support 60-ns, 5-volt, dynamic RAM double in-line memory modules (DIMMs). The DIMMs used by the Netra t 1400 and 1405 servers are the same type as those used in other Sun systems. Memory is organized into four banks of four DIMMs.

For best system performance, memory DIMMs must be installed in sets of four of identical DIMMs. With two banks of DIMMs installed, (sets of four per bank) memory operations can be two-way interleaved, resulting in the average latency for reads and writes being reduced almost in half, nearly doubling the memory throughput over non-interleaved operations.

Both 64-MB and 256-MB DIMMs are supported, offering a minimum configuration of 256 MB (one bank populated with 4 x 64 MB), and a maximum of 4 GB (four banks populated with 16 x 256 MB).

## System I/O

System I/O for the Netra t 1400 and 1405 servers is provided by two industry-standard peripheral component interconnect (PCI) data buses that comply with the 2.1 revision of the PCI specification. These two independent PCI buses can deliver high I/O bandwidth of up to 200 MB per second sustained throughput. Four slots are available for PCI cards to be inserted.

Slots	Slot Width	Clock Rate	Card Input Voltages Supported
1	64-bit	33/66 MHz	5V/3.3V supply, 3.3V signaling
2	32/64-bit	33 MHz	5V/3.3V supply, 5V signaling
3	32/64-bit	33 MHz	5V/3.3V supply, 5V signaling
4	32-bit	33 MHz	5V/3.3V supply, 5V signaling

The systems can support any Sun-branded PCI cards. Using non-Sun branded cards may invalidate the NEBS compliance. Sun-branded PCI cards are NEBS compliant for use in the Netra t 1400 and 1405 servers and include the following:

- 10/100 BASE-T Ethernet
- Quad Fast Ethernet
- High-speed serial interface
- Multiport serial asynchronous interface
- Differential UltraSCSI
- ATM 155 MB
- Gigabit Ethernet & FC-AL combo
- FC-AL Host Adapter
- Single Fiber Channel

PCI cards are installed in the factory as part of an assemble-to-order service. The Netra t 1400 and 1405 servers are NEBS compliant. Other PCI cards supplied as X-option or from as third party sources may invalidate NEBS compliance.

The Netra t 1400 and 1405 servers also provide 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 Cat-5 STP or RJ45 connector)
- One external 2-MB Centronics-compatible, bidirectional, EPP parallel port with a 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)
- Keyboard and mouse connector, although Sun will not make keyboard support part of the NEBS-compliant configuration
- No connector for graphics, although it is possible to use a PCI card; in this case it may invalidate NEBS compliance

## Storage

Internal data storage for the Netra t 1400 server is provided by up to four 3.5-inch x 1-inch or 3.5-inch x 1.6-inch UltraSCSI disk drives. Peak data transfer rates of 40 MB per second can be supported.

NEBS-compliant, 18.2-GB and 36.4-GB, 10000-rpm disk are available.

External data storage can be connected via a differential UltraSCSI port or FC-AL PCI cards. RAID and JBOD can be supported. See storage information in other documents especially Netra st A1000, D130, and D1000 arrays for NEBS-compliant disk subsystems. See T3 StorEdge for FC-AL Storage (not NEBS certified)

Removable media storage in the Netra t 1400 and 1405 servers can be added via a front-accessed media cradle which can hold, an optional 10X DVD-ROM and an optional 12 to 24-GB DDS-3 DAT drive. For ease of installation this cradle can be simply removed from the front of the system to allow removable media devices to be removed or serviced.





## Fast Ethernet

The Netra t 1400 and 1405 servers provide an on-board 10/100 Mbps Fast Ethernet port. Fast Ethernet technology from Sun is compatible with 10-Mbps Ethernet; the speed is automatically sensed 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 1400 and 1405 systems supports access to Category 5 twisted pair through an RJ45 connector.

# System Management

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## Solaris™ Operating Environment

The Netra™ t 1400 and 1405 systems includes one of the industry's leading UNIX® operating systems, the Solaris™ Operating Environment. Built on the latest UNIX technology, the Solaris Operating Environment delivers outstanding scalability and performance. The Solaris Operating Environment provides easy access to a wide range of computing environments and network technologies. The Solaris Operating Environment delivers a competitive advantage to business through networked computing, scalability, and multi-architecture support. It provides an advanced excellent solution for all customer needs. The Solaris Operating Environment is an industrial-grade solution with the performance, quality, and robustness to deliver mission-critical reliability.

The Solaris 7 and 8 Operating Environment versions are supported on the Netra t 1400 and 1405 systems. The Solaris Operating Environment delivers a powerful, reliable processing environment with enhanced networking capabilities and performance, increased standards compliance, and key operating system performance advancements.

## Licensing and Usage

The Netra t 1400 and 1405 servers come with a Solaris server license. The system, is preconfigured with Solaris JumpStart™ software, which allows the customer to easily load the full Solaris Operating Environment of their choice either by downloading from another system, or from CD.

# Ordering Information

The Netra™ t1400 and 1405 servers are available either as Assemble To Order (ATO) configuration, where the customers specific configuration is defined and built in Sun's factories, or through a limited number of pre-defined configurations.

To complete a valid Sales Order for a system ordered through ATO follow the steps set out below. See End User Price Book for prices and the latest updates.

Each step represent a line item on a Sales Order.

## Step 1—Order Base Configuration (Required)

Choose between AC or DC system.

**N14-AA** Netra t 1405 server (AC), base enclosure for Assemble To Order configuration (chassis/motherboard/alarms/AC PSU) + DOCS + 19 inch rack kit (four flanges, two handles, and screws), AC internal power supply, NEBS compliance Level 3 for Central Office, four PCI slots. No graphics, no audio.

**N15-AA** Netra t 1400 server (DC), base enclosure for Assemble To Order configuration (chassis/motherboard/alarms/ DC PSU) + DOCS + 19 inch rack kit (four flanges, two handles, and screws) -48/60VDC power supply dual input NEBS compliance Level 3 for Central Office, four PCI slots. No graphics, no audio.

## Step 2—Order Processor Module (Required)

Add one to four 440-MHz processor module(s).

**1197A** 440-MHz UltraSPARC™-II with 4-MB Ecache

## Step 3—Order Memory (Required)

Add two to eight pairs of memory—install in groups of four DIMMs (Max 16 DIMMs—eight pairs).

**7005A** 512-MB memory (2 x 256-MB DIMMs)

**7043A** 128-MB memory (2 x 64-MB DIMMs)

## Step 4—Order Internal Disk Driver (Required)

Add up to four storage disk drives (internal).

**5247A** 18.2-GB, internal, 10000-rpm SCSI disk

**5242A** 36.4-GB, internal, 10000-rpm SCSI disk

## Step 5—Order Removable Media Devices (Required)

Add removable media devices—add one DAT tape or one CD-ROM drive (maximum one each).

<b>6168A</b>	10X internal DVD-ROM drive
<b>6912A</b>	12–24-GB, 4-mm DDS-3 internal tape drive

## Step 6—Order Alarms Card Software (Optional)

Add alarms card software. Order one CD if customer wishes to use the standard alarms software.

<b>X7077A</b>	Netra t alarms card software; CD that contains the alarms driver/utilities for the Solaris™ 7 Operating Environment; see configuration guidelines
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## Step 7—Order PCI Cards (Optional)

Add up to four PCI card(s)—maximum of three 5V PCI cards (one further universal voltage card can be added) or maximum four universal voltage cards; see configuration guidelines for further info.

<b>1032A</b>	PCI 10/100BASE-T (5V card—maximum three)
<b>1033A</b>	PCI 10/100BASE-T NIC 2 (universal—maximum four)
<b>1034A</b>	PCI Sun Quad Fastethernet™ (QFE) with software (universal—maximum four)
<b>1155A</b>	PCI SunHSI/P™ 2.0 (5V card—maximum three)
<b>1157A</b>	PCI SunATM™/P-155MMF with software (universal—maximum four)
<b>6541A</b>	PCI UltraSCSI differential controller (universal—maximum four)
<b>2069A</b>	PCI GEthernet + FC-AL combo (universal—maximum four)
<b>6729A</b>	PCI FC-AL Host Adapter (universal—maximum four)
<b>6799A</b>	PCI Single Fiber Channel (universal—maximum four)

The following PCI cards are supported and available as stand-alone x-options only. Because these cards have not been tested for the NEBS level 3 standard they must be added to the system by the customer, and may invalidate the NEBS 3 certification.:

<b>X1133A</b>	PCI Crypto Accelerator (universal—maximum four)
<b>X2156A</b>	PCI Serial Asynchronous Interface (SAI/P) 3.0 (universal—maximum four)
<b>X1141A</b>	PCI Gigabit Ethernet 2.0 (GBE/P) (universal—maximum four)
<b>X1150A</b>	PCI Sun GigaSwift Ethernet UTP (universal—maximum four)
<b>X6727A</b>	PCI Dual FC Network Adapter (universal—maximum four)

## Step 8—Order Power Cord Kit (Required for N14 Only)

Add power cord kit—order one power cord kit.

<b>X311L</b>	North American power cord
<b>X312L</b>	Continental European power cord



<b>X314L</b>	Swiss power cord
<b>X317L</b>	UK power cord
<b>X383L</b>	Danish power cord
<b>X384L</b>	Italian power cord
<b>X386L</b>	Australian power cord

### **Step 9—Order Rackmount Flange Kits (Optional)**

Add rackmount kits. Each kit contains four flanges, two handles, and screws. A 19-inch rackmount kit is included with every system order.

<b>X7071A</b>	19-inch kit (included in ship kit)
<b>X7072A</b>	23-inch kit
<b>X7074A</b>	600-mm kit

### **Step 10—Order Rackmount Slide Adapter Kit (Optional)**

Add rackmount slide adapter kit. Only for 19-inch Sun racks.

<b>X7099A</b>	Two slide kits for fitting into 19-inch Sun racks, including an adapter and screws.
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### **Step 11—Order Software (Optional)**

Add software—Order the relevant server version of the Solaris Operating Environment.

Part numbers for Solaris Operating Environment for servers begin with SOLS. The Solaris 7 and 8 Operating Environments are available.

See options or configtool for confirmation.

## Sun Netra t 1400 Server Fixed Configuration Ordering Flow Chart

To complete a valid Sales Order for a system ordered through fixed config follow the steps set out below. See End User Price Book for prices and the latest updates.

Each step represents a line item on a Sales Order.

### Step 1—Order Base Configuration (Required)

Choose single, double, or quad processor system.

<b>N15-ULD1-9S-256AT</b>	Base package Netra t 1400 server  Fixed configuration Netra t 1400 server (DC) single 440-MHz processor, 256-MB RAM, 18-GB disk, two slots for removable media devices, rackmountable, Telecom alarm card: minor,major,critical, -48/60VDC power supply, dual input, NEBS compliance Level 3 for central office, four PCI slots, no graphics, no audio, 19-inch rackmount kit.
<b>N15-ULD2-9S-1024AT</b>	Netra t 1400 (DC) dual 440-MHz processors, 1-GB RAM, two 18-GB disks, two slots for removable media devices, rackmountable, Telecom alarm card: minor,major,critical, -48/60VDC power supply, dual input, NEBS compliance Level 3 for central office, four PCI slots, no graphics, no audio, 19-inch rackmount kit.
<b>N15-ULD2-9S-2048AV</b>	Netra t 1400 (DC) dual440-MHz processors, 2-GB RAM, two 36-GB disks, two slots for removable media devices, rackmountable, Telecom alarm card: minor,major,critical, -48/60VDC power supply, dual input, NEBS compliance Level 3 for central office, four PCI slots, no graphics, no audio, 19-inch rackmount kit.
<b>N15-ULD4-9S-4096AV</b>	Netra t 1400 (DC) quad 440-MHz processors,4-GB RAM, two 36-GB disks, two slots for removable media devices, rackmountable, Telecom alarm card: minor,major,critical, -48/60VDC power supply, dual input, NEBS compliance Level 3 for central office, four PCI slots, no graphics, no audio, 19-inch rackmount kit.

### Step 2—Order Rackmount Flange Kits (Optional)

Each kit contains four flanges, two handles, and screws. A 19-inch rackmount kit is included with every system order.

<b>X7072A</b>	Four 23-inch kit flanges, two handles, and screws
<b>X7074A</b>	Four 600-mm kit flanges, two handles, and screws

### Step 3—Order Rackmount Slide Adapter Kit (Optional)

Add rackmount slide adapter kit. Only for 19-inch Sun racks.

<b>X7099A</b>	Two slide kits for fitting into 19-inch Sun racks, including an adapter and screws.
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## Step 4—Order Alarm Software (Optional)

Add alarms card software (LOMlite CD, 1 version).

**X7077A** Netra t alarms card software—CD contains the alarms driver/utilities and VTS for the Solaris 2.6 or 7 Operating Environment. See configuration guidelines.

## Step 5—Order Internal Disk Drives (Optional)

Add one to four storage disk drives (internal), maximum four disks.

**X5247A** 18.2-GB, internal, 10000-rpm SCSI disk

**X5242A** 36.4-GB, internal, 10000-rpm SCSI disk

## Step 6—Order Memory (Optional)

Add two to eight pairs of memory. From 256-MB to 4-GB memory. Memory must be installed in groups of four DIMMs and there must be at least two pairs. (maximum 16 DIMMs—8 pairs)

**X7043A** 128-MB memory (2 x 64-MB DIMMs)

**X7005A** 512-MB memory (2 x 256-MB DIMMs)

## Step 7—Order Processor Module (Optional)

Add one to four 440-MHz processor modules (maximum four processors).

**X1197A** 440-MHz UltraSPARC-II processor with 4-MB Ecache

## Step 8—Order Removable Media Devices (Optional)

Add removable media devices. Add one DAT tape and/or one CD-ROM drive (maximum one each).

**X6168A** 10X internal DVD-ROM drive

**X6912A** 12 to 24-GB, 4-mm DDS-3 internal tape drive

## Step 11—Order Power Cord Kit (Required)

Add one power cord kit.

**X311L** North American power cord

**X312L** Continental European power cord

**X314L** Swiss power cord

**X317L** UK power cord

**X383L** Danish power cord

**X384L** Italian power cord

**X386L** Australian power cord



## Sun Netra t 1405 Server Fixed Configuration Ordering

To complete a valid Sales Order for a system ordered through fixed config follow the steps set out below. See End User Price Book for prices and the latest updates.

Each step represents a line item on a Sales Order.

### Step 1—Order Base Configuration (Required)

Choose single, double, or quad processor system.

<b>N14-ULD1-9S-256AT</b>	Netra t 1405 server (AC) single 440-MHz processor, 256-MB RAM, 18-GB disk, two slots for removable media devices, rackmountable, Telecom alarm card: minor,major,critical 110/240VAC power supply, dual input, NEBS compliance Level 3 for central office, four PCI slots, no graphics, no audio, 19-inch rackmount kit.
<b>N14-ULD2-9S-1024AT</b>	Netra t 1405 server (AC) dual 440-MHz processors, 1024-MB RAM, two 18-GB disks, two slots for removable media devices, rackmountable, Telecom alarm card: minor,major,critical 110/240VAC power supply, dual input, NEBS compliance Level 3 for central office, four PCI slots, no graphics, no audio, 19-inch rackmount kit.
<b>N14-ULD2-9S-2048AV</b>	Netra t 1405 server (AC) dual440-MHz processors, 2-GB RAM, two 36-GB disks, two slots for removable media devices, rackmountable, Telecom alarm card: minor,major,critical 110/240VAC power supply, dual input, NEBS compliance Level 3 for central office, four PCI slots, no graphics, no audio, 19-inch rackmount kit.
<b>N14-ULD4-9S-4096AV</b>	Netra t 1405 server (AC) quad 440-MHz processors, 4-GB RAM, two 36-GB disks, two slots for removable media devices, rackmountable, Telecom alarm card: minor,major,critical 110/240VAC power supply, dual input, NEBS compliance Level 3 for central office, four PCI slots, no graphics, no audio, 19-inch rackmount kit.

### Step 2—Order Rackmount Flange Kits (Optional)

Each kit contains four flanges, two handles, and screws. A 19-inch rackmount kit is included with every system order.

<b>X7072A</b>	Four 23-inch kit flanges, two handles, and screws
<b>X7074A</b>	Four 600-mm kit flanges, two handles, and screws

### Step 3—Order Rackmount Slide Adapter Kit (Optional)

Add rackmount slide adapter kit. Only for 19-inch Sun racks.

<b>X7099A</b>	Two slide kits for fitting into 19-inch Sun racks, including an adapter and screws.
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## Step 4—Order Alarm Software (Optional)

Add alarms card software (LOMlite CD, 1 version).

<b>X7077A</b>	Netra t alarms card software
	CD contains the alarms driver/utilities and VTS for the Solaris 2.6 or 7 Operating Environment. See configuration guidelines.

## Step 5—Order Internal Disk Drives (Optional)

Add one to four storage disk drives (internal). Maximum four disks.

<b>X5247A</b>	18.2-GB, internal, 10000-rpm SCSI disk
<b>X5242A</b>	36.4-GB, internal, 10000-rpm SCSI disk

## Step 6—Order Memory (Optional)

Add two to eight pairs of memory. From 256-MB to 4-GB memory. Must install in groups of four DIMMs. Must be at least two pairs. (Max 16 DIMMs—8 pairs)

<b>X7043A</b>	128-MB memory (2 x 64-MB DIMMs)
<b>X7005A</b>	512-MB memory (2 x 256-MB DIMMs)

## Step 7—Order Processor Module (Optional)

Add one to four 440-MHz processor modules.

<b>X1197A</b>	440-MHz UltraSPARC-II processor with 4-MB Ecache
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## Step 8—Order Removable Media Devices (Optional)

Add removable media devices. Add one DAT tape and/or one CD-ROM drive (maximum one each).

<b>X6168A</b>	10X internal DVD-ROM drive
<b>X6912A</b>	12 to 24-GB, 4-mm DDS-3 internal tape drive

## The Netra t 1400 and Netra 1405 Servers Configuration Guidelines

### Base Packages

- The Netra t 1405 server is an AC simplex Telecom server—base part number N14-AA.
- The Netra t 1400 server is a DC simplex Telecom server—base part number N15-AA.
- The base part includes the chassis, power supply (AC for N14-AA and DC for N15-AA), alarms card, 19-inch rackmount kit (four flanges and two handles), the full English version manual set and Solaris JumpStart™ software for the Solaris Operating Environment.

### Processor

The Netra t 1400 and 1405 servers support a maximum of four UltraSPARC-II processor modules.



## Memory

- Minimum of four DIMMs (bought in pairs); maximum of 16 DIMMs (eight pairs).
- Memory should be installed in like groups of four DIMMs per bank to allow interleaving.

## Rackmount Options

### • Rackmount kits

A kit for 19-inch rackmounting is automatically shipped with the base system (not fitted). The kit contains two pairs of flanges, two handles, and fittings. If a different size rackmount kit is required, discard the flanges from this kit. X-option rackmount kits contain two pairs of vertical flanges for fitting in front/rear or mid-side locations. Two handles are included. Mounting locations are also provided for industry standard rails.

### • Rackmount slide adaptor kits

An adaptor kit for slides.

## Air Filter Pack

Contains 10 foam filters to replace used filters in the system.

## Disk

A minimum of one disk must be ordered. The maximum is four internal disk drives.

## Removable Media—DVD-ROM and DAT Tape Drive

- The base configurations feature two RMM slots. One can house a DVD-ROM and the other a DAT tape drive. Only one of each can be configured.
- There is no floppy disk support.

## PCI

- There are four full-sized slots for PCI cards. These slots conform to PCI specification 2.1.

Slot	Slot Width	Clock Rate	Card Input Voltages Supported
1	64-bit	33/66 MHz	5V/3.3V supply, 3.3V signaling
2	32/64-bit	33 MHz	5V/3.3V supply, 5V signaling
3	32/64-bit	33 MHz	5V/3.3V supply, 5V signaling
4	32-bit	33 MHz	5V/3.3V supply, 5V signaling

- PCI cards which have not been tested to be NEBS compliant are only available as X-options and cannot be ordered to be assembled in the factory. These cards can be added to the system as an X-option, but further testing may be necessary to help ensure they do not invalidate the NEBS compliance. The PCI cards shown in the ordering flow chart are NEBS compliant. The extra cards, shown in the X-option list, will be packaged separately and must be added by the customer.

- The Gigabit Ethernet PCI card and the ATM 622 PCI cards both have a maximum limit of two cards due to bandwidth constraints. Four of these can be fitted if two are not active and only used in a redundant pair.
- Note the PCI card voltage requirements listed in the table below.

<b>X1032A</b>	PCI 10/100BASE-T NIC	5V—maximum three + one 3.3V/universal voltage card
<b>X1033A</b>	PCI 10/100BASE-T NIC 2	Universal—maximum four; allow four cards or combination of four of these or any other universal card; up to four of these and up to three 5V cards to fill four slots
<b>X1034A</b>	Sun Quad Fastethernet (QFE) PCI with software	Universal
<b>X1067A</b>	PCI SunATM/P-155UTP with software	Universal
<b>X1068A</b>	PCI SunATM/P-622MMF with software	Universal
<b>X1141A</b>	Gigabit PCI adapter	Universal
<b>X1152A</b>	SunFDDI™/P SAS 2.0	5V
<b>X1153A</b>	SunFDDI/P DAS 2.0	5V
<b>X1154A</b>	SunTRI/P™ 2.0	Universal
<b>X1155A</b>	SunHSI/P 2.0	5V
<b>X2156A</b>	SunSAI/P 3.0	Universal
<b>X1157A</b>	PCI SunATM/P-155MMF with software for Solaris 7 Operating Environment	Universal
<b>X6541A</b>	PCI UltraSCSI differential controller	Universal
<b>X2069A</b>	PCI GEthernet + FC-AL combo	Universal
<b>X6729A</b>	PCI FC-AL Host Adapter	Universal
<b>X6799A</b>	PCI Single Fiber Channel	Universal

## SCSI

- The Sun Netra t 1400 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).

## Software

- The English version of Solaris JumpStart software for the Solaris 7 and 8 Operating Environments will be installed on each system in the factory to aid OS installation. Versions of the Solaris 7 and 8 Operating Environments are available on CD.

## Storage

- Netra st D130, Netra st A1000, and Netra st D1000 arrays are supported with the Netra t 1400 and 1405 servers. The Netra st A1000 array is a 4U Telecom RAID storage array for Telecom/ISP. The Netra st D1000 array is a 4U non-RAID (JBOD) storage array for Telecom/ISP. The Netra st D130 array is a 1U storage array for Telecom/ISP. These storage units are available in AC power or DC power configurations. The connection can be made with option X6541, the UD2S PCI Dual Port UltraSCSI host bus adapter. See the Netra st Configuration Guide for further details. T3 FC-AL storage is also supported. This has not been tested for NEBS certification.



## Other Notes

- Power cords are not supplied on the Netra t 1400 server because this equipment uses DC power inputs for -48/60 volt. Connectors are included in the installation pack.
- An English language version of the manual set is included with every system including the Installation and User Guide, Service Manual, System Reference Manual, Compliance, and Safety Guide.
- Electronic copies of the manual set are available on request for the following languages: English, French, German, Italian, Spanish, Swedish, Japanese, Cantonese, and Simplified Chinese. Contact Giuseppe.Prestigiovanni@sun.com for further information.
- The Compliance and Safety Guide is localized in English, French, German, Italian, Spanish, Swedish, Japanese, Cantonese, and Simplified Chinese.
- System and memory upgrades are available from the Upgrades price book.
- Regarding earthquake zone compliance, as stated on the NEBS Level 3 standard, the compliance zone is Earthquake Zone 4. Zone 4 is the area of the globe, including California, that is susceptible to the worst earthquake. The equipment must be fully operational after the earthquake and sustain no physical damage (other than cosmetic) that might impact its operation. The equipment can fail during the earthquake but must recover state without manual intervention.

# Options

Part Number	Option Description	Maximum Number Supported	Comments
<b>Processors</b>			
X1197A	440-MHz UltraSPARC-II processor with 4-MB Ecache	4	
<b>Memory</b>			
X7005A	512-MB memory expansion (2 x 256-MB DIMMs)	8	Additional memory must be installed in groups of 4 same-sized DIMMs.
X7043A	128-MB memory expansion (2 x 64-MB DIMMs)	8	
<b>Internal Disk Drives</b>			
X5247A	Internal 18.2-GB, 10000-rpm, 1-inch high UltraSCSI disk drive	4	
X5242A	Internal 36.4-GB, 10000-rpm, 1-inch high UltraSCSI disk drive	4	
<b>Internal Removable Media Drives</b>			
X6168A	10X internal DVD-ROM drive.	1	
X6912A	12 to 24-GB, 4-mm DDS-3 internal tape drive	1	
<b>Alarms Software CD</b>			
X7077A	Alarms card software driver, media (fully internationalized)	1	
<b>Country Kit/Power Cord</b>			
X311L	North American power cord	1	
X312L	Continental European power cord	1	
X314L	Swiss power cord	1	
X317L	UK power cord	1	
X383L	Danish power cord	1	
X384L	Italian power cord	1	
X386L	Australian power cord	1	
<b>Rackmount Flange Kits</b>			
X7072A	23-inch rackmount kit		Kits contain four vertical flanges for fitting in front, mid size or rear locations.
X7074A	600-mm rackmount kit		
<b>Rackmount Slide Adapter Kit</b>			
X7099A	Rackmount slide adapter kit. Mounting locations are provided.		

Part Number	Option Description	Maximum Number Supported	Comments
<b>Air Filter Pack</b> X7075A	10 foam filter to replace used filters in the system		

# Upgrades

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Sun upgrades offer customers superior investment protection for their existing Sun equipment.

## Key Messages

- Sun offers customers a variety of flexible upgrade (trade-in) paths to the most popular Sun systems
- Choose from chassis-only to full-system upgrades
- Sun upgrades allow as many components as possible to be carried forward, to protect the customer's hardware investment
- Existing investments in non-Sun hardware can be preserved by trading them in to Sun through competitive full-system upgrades
- Sun Enterprise™ server upgrades offer superior value by allowing the migration of memory to Sun Netra t 1400 or 1405 server systems.

# Service and Support

The SunSpectrum<sup>SM</sup> program 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 program provides a simple pricing structure in which a single fee covers support for an entire system, including related hardware and peripherals, the Solaris<sup>TM</sup> Operating Environment, and telephone support for Sun<sup>TM</sup> software packages. The majority of Sun's customers today take advantage of the SunSpectrum program, underscoring the value that it represents. Customers should check with their local Sun Enterprise Services representatives for program and feature availability in their areas.

FEATURE	SUNSPECTRUM PLATINUM <sup>SM</sup> Mission-critical Support	SUNSPECTRUM GOLD <sup>SM</sup> Business-critical Support	SUNSPECTRUM SILVER <sup>SM</sup> Systems Support	SUNSPECTRUM BRONZE <sup>SM</sup> Self Support
<b>Systems Features</b>				
Systems approach coverage	Yes	Yes	Yes	Yes
System availability guarantee	Customized	No	No	No
<b>Account Support Features</b>				
Service account management team	Yes	No	No	No
Local customer support management	No	Yes	No	No
Personal technical account support	Yes	Yes	Option	No
SunStart <sup>SM</sup> installation service	Yes	No	No	No
Account support plan	Yes	Yes	No	No
Software release planning	Yes	No	No	No
On-site account reviews	Monthly	Semiannual	No	No
Skills assessment	Yes	No	No	No
Site activity log	Yes	Yes	No	No
<b>Coverage / Response Time</b>				
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	Option
7-day/24-hour on-site coverage	Yes	Option	Option	N/A
7-day/12-hour on-site coverage	No	Option	No	No
5-day/24-hour on-site coverage	No	Option	No	No



FEATURE	SUNSPECTRUM PLATINUM <sup>SM</sup> Mission-critical Support	SUNSPECTRUM GOLD <sup>SM</sup> Business-critical Support	SUNSPECTRUM SILVER <sup>SM</sup> Systems Support	SUNSPECTRUM BRONZE <sup>SM</sup> Self Support
<b>Coverage / Response Time (cont.)</b>				
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
2-hour on-site response	Yes	Option	Option	N/A
Additional contacts	Option	Option	Option	Option
<b>Premier Support Features</b>				
Mission-critical support team	Yes	For urgent problems	No	No
Sun Vendor Integration Program (SunVIP <sup>SM</sup> )	Yes	Yes	No	No
Software patch management assistance	Yes	No	No	No
Field change order (FCO) management assistance	Yes	No	No	No
<b>Hardware Support Delivery</b>				
Replacement hardware parts	On-site technician	On-site technician	On-site technician	Courier
Two day parts delivery	N/A	N/A	N/A	Yes
Overnight parts delivery	N/A	N/A	N/A	Option
Same-day parts delivery	Yes	Yes	Yes	Option
<b>Remote Systems Diagnostics</b>				
Remote dial-in analysis	Yes	Yes	Yes	Yes
Remote systems monitoring	Yes	Yes	No	No
Remote predictive failure reporting	Yes	Yes	No	No
<b>Software Enhancements and Maintenance Releases</b>				
Solaris enhancement releases	Yes	Yes	Yes	Yes
Patches and maintenance releases	Yes	Yes	Yes	Yes
Sun unbundled software enhancements	Option	Option	Option	Option
<b>Internet and CD-ROM Support Tools</b>				
SunSolve <sup>SM</sup> license	Yes	Yes	Yes	Yes
SunSolve EarlyNotifier <sup>SM</sup> Service	Yes	Yes	Yes	Yes



# Glossary

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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.
HLR	A permanent database used in GSM (Global System for Mobile Communications) to identify a subscriber and to contain subscriber data related to features and services.
NEBS	Network Equipment Building System. A set of standards defined by Telcordia (formerly Bellcore) for equipment to be deployed in telecommunications 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.
DIMM	Dual inline memory module. A form of chip packaging in which leads (pins) are arranged in a single row protruding from the chip.
UNIX	An immensely power and complex operating system for computers for running data processing and for running telephone systems.
UPA	Ultra™ port architecture.
VLR	Visitors' Location Register. A local database to an MSC (Mobile Services Switching Center) for registering visiting mobile station user