Netra^{tm} X1 Server

White Paper

Product Introduction

Product Overview

The Netra^{tm} X1 server is an ultra-low cost, high performance rack mount entry level product targeted at the Service Provider market. The Netra X1 server is first sub $1,000 UNIX$^{(R)}$ based server. The Netra X1 server maintains the Netra T1 server product architecture which also employs low-cost, commodity components from the PC industry. Netra X1 server will complement the Netra T1 product line and will be marketed as part of the Netra T1 family.

The Netra X1 server is a single processor, thin (1U) server designed primarily for use by the service providers. It is also suitable for use within the corporate customer networks, wherever there is a need to maximize the density of high performance Solaris^{tm} servers. The Netra X1 server has only a depth of 13" (330mm), hence minimizing real-estate. Also, due to its cost and high reliability, other markets that require a 1U server may choose to use this server.

Because the Netra X1 server is a general-purpose server, it is ideal for independent software vendors (ISVs), OEMs, and resellers who want an inexpensive platform on which to develop or deploy applications.

FIGURE 1-1 Netra X1 Server - Front & Rear Views

The Netra X1 server have the following features:

- ❑ 400MHz UltraSPARC^{tm} IIe processor
- ❑ Server has a single rack mountable power supply
- ❑ 4 DIMM sockets supporting standard PC133 128MB or 256MB memory
- ❑ Two 10/100BaseT (RJ45) Ethernet ports
- ❑ System contains two RJ45 serial ports, port A is combined console/LOM port
- ❑ Two USB ports
- ❑ Supports up to two 20GB low-profile 3.5" IDE disks
- ❑ Customer label area
- ❑ Energy Star compliance

Target Applications

The Netra X1 server is designed for service providers currently running Windows/Linux on Intel platform. With a similar price to PC based servers the Netra X1 server provides all the benefits of a true Sun server to support typical applications such as:

- ❑ Firewalls
- ❑ DNS
- ❑ Log processing
- ❑ Authentication
- ❑ Mail-relay
- ❑ Distributed SNMP
- ❑ front-end web server
- ❑ front-end hosting server
- ❑ front-end application server
- ❑ Print server
- ❑ Proxy server

Designed for Simplicity

The Netra X1 servers enclosure is more compact than the Netra T1 servers. As in the Netra T1 200 Series server, a System Configuration Card (SCC) is used to store the system configuration. The SCC allows the user to swap a server with a replacement with minimal reconfiguration. The system configuration stored on the SCC can be moved from one server to another simply by removing the SCC and re-inserting it into another server. All system configuration information is now transferred to the new server. The SCC reader in the Netra X1 is located on the rear of the enclosure.

All internal components are easily accessed from the top of the enclosure by first removing the top cover which is secured by one screw.

System Architecture

The Netra X1 server utilizes a 400MHz UltraSPARC^{tm} IIe high performance processor with 256KB L2 cache rendering an impressive system performance. The system memory consists of industry standard PC133 DIMMs with a 72-bit data path (including ECC bits), and can address up to 1GB of memory space.

External I/O devices include two 10BaseT/100BaseTX auto-negotiating Ethernet ports. Two USB ports with individual OHCI controllers. Two asynchronous RJ45 serial ports are compatible with a CISCO L2511 terminal server. Serial port A is a combined console and LOMlite2 port for "lights-out-management".
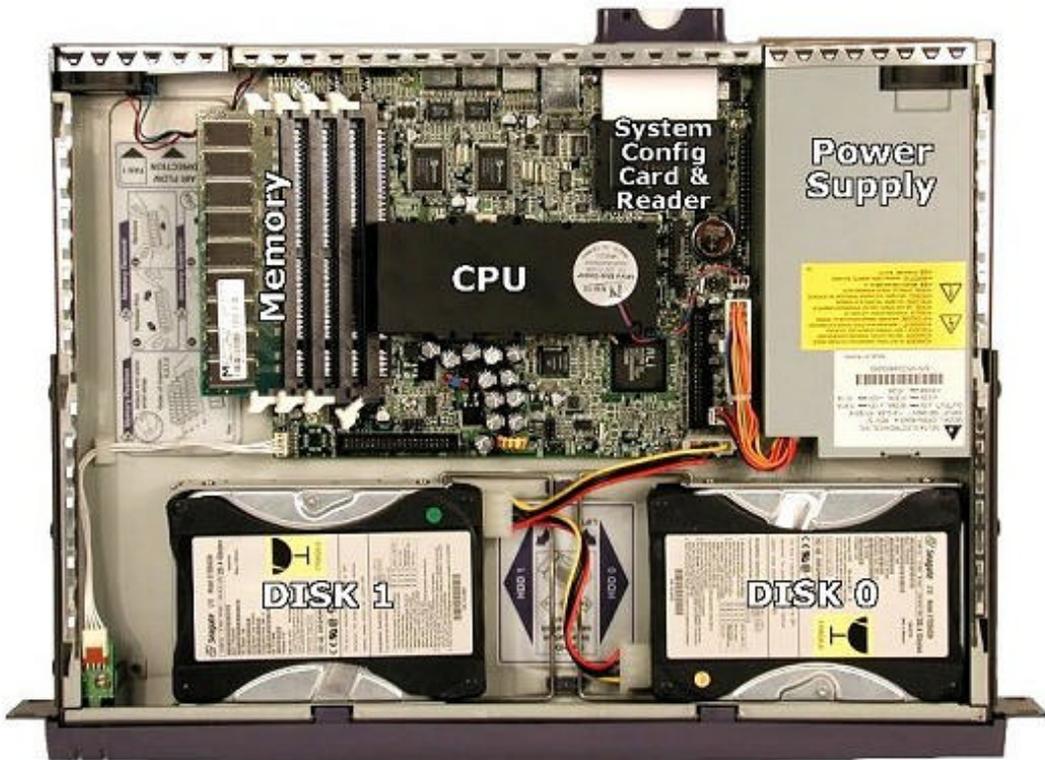
FIGURE 1-2 Internal view of the Netra X1Server
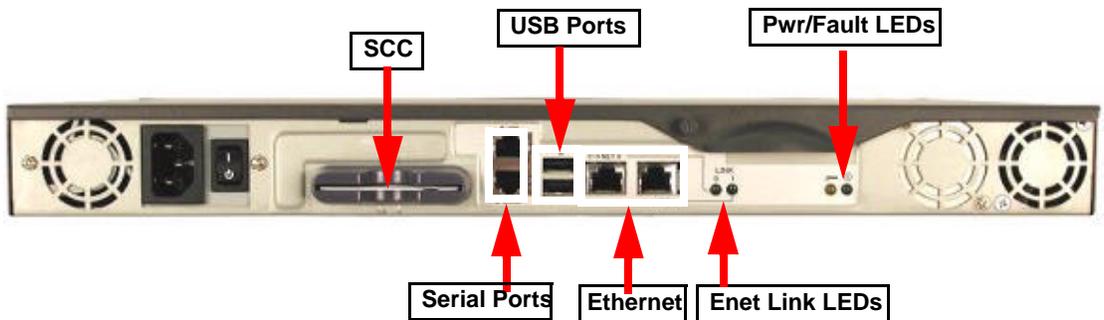
FIGURE 1-3 External Interface Connectors

Additional internal devices comprise of 1MB flash PROM to house the Open Boot PROM (system firmware), OBDiag (internal diag), and the Power-on Self-Test. The real-time clock has 8KB Non-volatile RAM and a FRU ID PROM to store information regarding that FRU such as its part number and revision.

The service processor provides the interface for LOM operation, power state management, environmental (enclosure) management and host status management.

Motherboard

The Netra X1 Server motherboard is shown in Figure 1-4. Major components on the motherboard are:

❑ 400MHz UltraSPARC IIe Processor

❑ 4 slots for PC133 memory modules

❑ System Configuration Reader

❑ Various system support ASICs and components
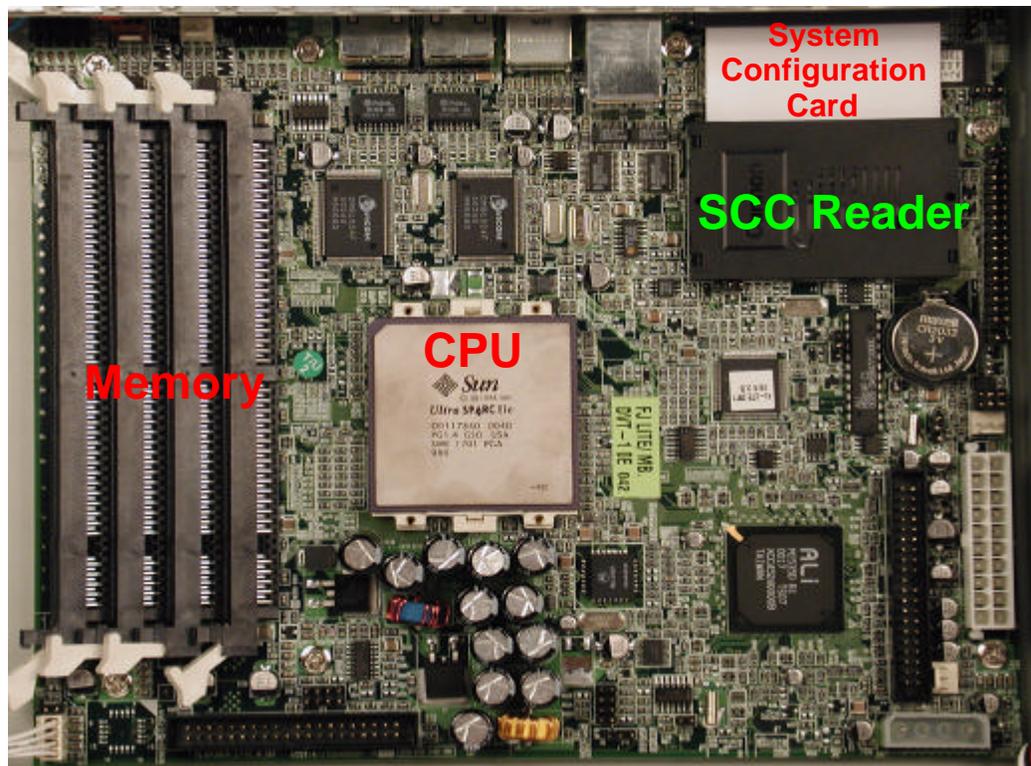
FIGURE 1-4 Netra X1Server Motherboard

System Architecture (continued)

Drawing shown below is block diagram of the Netra X1 motherboard.
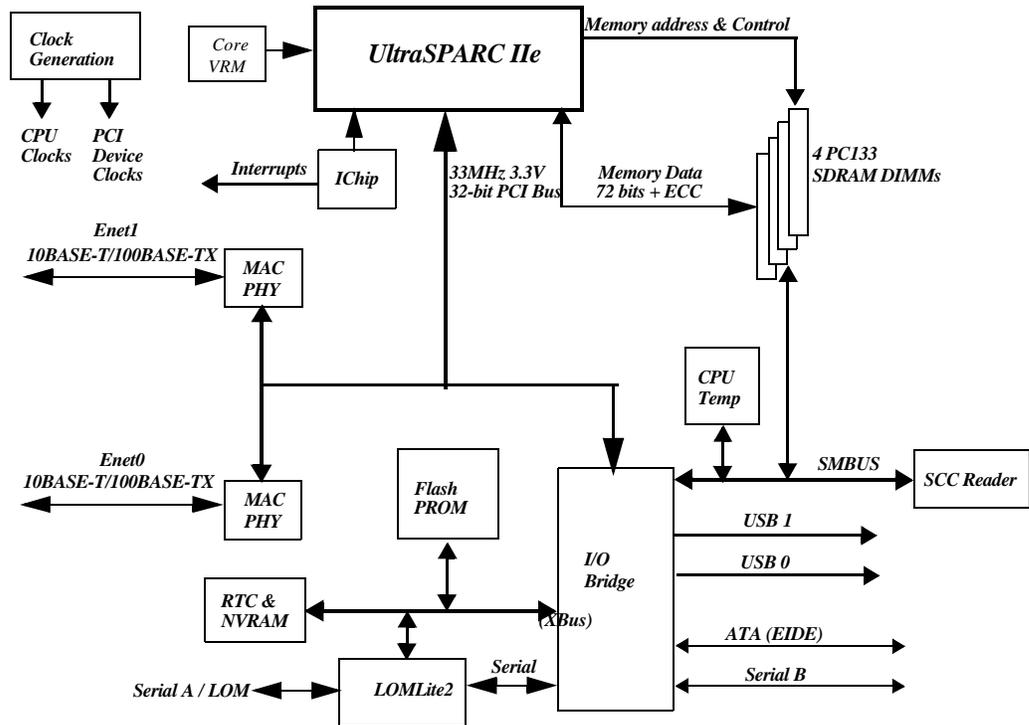
FIGURE 1-5 Netra X1 Motherboard Architecture

System Configuration Card (SCC)

The System Configuration Card augments the NVRAM as a non-volatile storage of system configuration information and system identity readily available to the user.

The function of the SCC is to facilitate easy transfer of the system configuration from system to system without reconfiguration. The SCC meets the ISO 7816 specifications for physical characteristics and for dimension and location of contacts. The SCC has the following characteristics:

FIGURE 1-6 SCC

❑ ID 1 type card

❑ Dimension - 85.6mm x 53.98mm x 0.76mm

❑ Memory chip in card - 24C64

System Components

Drawing below shows the system components. Drawing is not to scale.
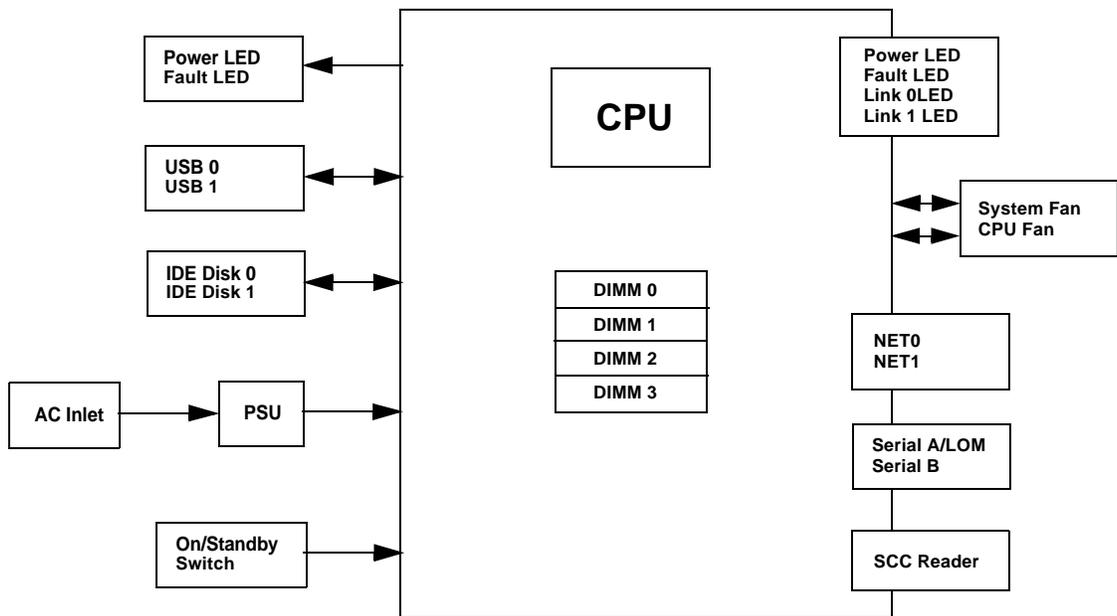
FIGURE 1-6 System Components

Optional Components

Following is a list of options for the Netra X1 server:

- ❑ X7090A - 128MB DIMM
- ❑ X7091A - 256MB DIMM
- ❑ X7095A - 20GB, 5400 RPM disk drive

Lights-Out-Management (LOMlite2)

The LOMlite2 is an enhanced version of LOM which provide support for remote system management. LOMlite2 capabilities are as follows:

- ❑ Enclosure (environmental) monitoring and Control
- ❑ NVRAM contains the last 700+ monitoring events
- ❑ Host Status Monitoring
- ❑ Power Control
- ❑ Automatic Server Restart (ASR)
- ❑ Programmable Soft Alarms
- ❑ Console-accessible Serial Management Interface
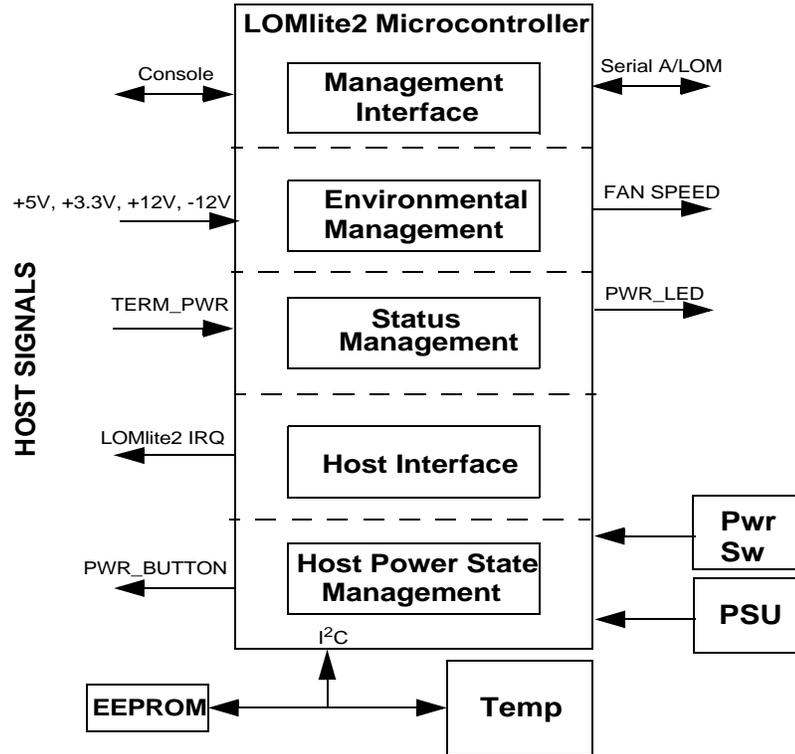
FIGURE 1-7 LOMlite2 Block Diagram

LOMlite2 is an autonomous service processor providing features such as system monitoring and control functions. The XBus provides a host interface between Solaris operating environment and the LOMlite2 firmware.

LOMlite2 is designed to support deployment in environments where remote management or environmental system monitoring is advantageous. LOMlite2 is an embedded Flash microcontroller module which is incorporated into the motherboard with the following interfaces:

❑ Host Parallel Interface via EBUS

❑ Host Watchdog, with optional ASR (Automatic Server Restart)

❑ Host Interrupt

❑ Host Reset

❑ Host Abort (XIR)

LOMlite2 is available remotely through the LOM serial port. For example, one can gain access from a modem, terminal server, PC, Palm Pilot or Sun Workstation and have full control of the server including remotely powering on and off the server.

Physical Dimension

Table 1-1 shows the physical dimension of the Netra X1 servers.

	Height	O/A Width	Depth Including Bezel	System Weight	Shipping Weight
Metric	43.6mm	436.7mm	330mm	6kg	10.0kg
Imperial	1.72"	17.19"	13"	13.2 lbs	22 lbs

TABLE 1-1 Physical Dimension

Power Management

The following power budget allows an estimated figure for power consumption for system configuration purposes.

Component	Measurement	Estimated Power Consumption
Base System	400MHz	20.2W
Memory	Per 256MB DIMM	4.59W
Disk Drive	20GB@5400RPM	6.5W (idle)

TABLE 1-2 System Power Budget

Power Supply Unit Output Rails

Following is a table of the PSU output rails:

Rail	Voltage Rating	Current Rating
+5VSB	+5V +/-5%	0.2A
+5V	+5V +/-2%	11.0A
+3.3V	+3.3V +/-3%	15.4A
+12V	+12 +/-2%	3.4A continuous 4.5A short-term (30s)
-12V	-12V +/-5%	0.1A

TABLE 1-3 Power Supply Output

Input Power Requirements

Table 1-4 shows the AC input requirements for the Netra X1 200 server.

Parameter	AC Rating
RMS Voltage Range	90V - 132V 180V - 264V
Frequency Range	47Hz - 63Hz
Operating Current (max)	3.0A @115VAC
Operating Power (max)	220W
Inrush Current	20A cold-start
Number of Inlets	1

TABLE 1-4 Input power requirements

Power States

There are three distinguishable system power states, determined by which power zones are active in the system.

Power State	+5VSB	+5V, +3.3V, +12V, -12V	Comment
OFF	Not Present	Not Present	No Inlet Power
STANDBY	Present	Not Present	Host Switched Off
ON	Present	Present	Host Switched On

TABLE 1-5 System Power States

LOMlite2 retains a memory of the host Power State in EEPROM. In the event that inlet power is lost by the system, the memory can restore the host to its previous power state. Under certain conditions resumption may be delayed or refused. Whether the system will return to OBP or boot to Solaris operating environment depends on the auto-boot setting in the OBP.

Environmental Specs

Type	Location	Min to Max Range
Temperature	Operating Non-Operating	14°F to 104°F, 5° C to 35° C -8°F to 158°F, -40° C to 70° C
Relative Humidity Non-condensing	Operating Non-Operating	10% to 90% (27° C max-wet bulb) 93% (38° C max-wet bulb)

TABLE 1-6 Environmental Specs

Rack Mounting

The Netra X1 Server chassis fits in a standard 19" rack. The chassis can be front or center mounted. The rack mount hardware comes standard with each system. The chassis can be mounted into either 2 post relay racks or 4 post racks with depths ranging from 400mm to 900mm. The chassis includes a detachable fixed rack mount system suitable for all 4 post racks. The 19" rack mounting kit is X6919A. The maximum number of servers can be mounted in a rack depending on the height and power inlets available. For example up to 32 Netra X1 Servers can be mounted into a Sun^{tm} 72" standard rack.

The chassis is held into the rack with a minimum number of fixings in all cases. This reduces the time required to install and upgrade systems.

Optional Components

Following is a list of options for the Netra X1 server:

❑ X7090A - 128MB DIMM

❑ X7091A - 256MB DIMM

❑ X7095A - 20GB, 5400 RPM disk drive

Summary

Netra X1 servers are fully-fledged Sun servers at PC prices. Designed for serviceability - the unit is a single FRU, Netra X1 servers are out of the box and ready to be mounted in a rack plus online in less than 20 minutes. The servers come with a range of manageability features including fault and link light indicators and remote management software pre-installed.

For additional information: http://www.sun.com/netra