Netra^{tm} E1 PCI System Expander

White Paper

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Netra[tm] E1 PCI Expander Unit

Product Overview

The Netra[tm] E1 PCI System Expander Unit can be used with any host system that contains at least one PCI slot. One host system PCI slot is occupied by the host interface card, therefore, the net gain is three additional PCI slots with the Netra E1 PCI Expansion Unit. For telecommunications, service providers, or any industry where PCI connectivity is key. Sun has the compact, cost-effective solution. The Netra E1 PCI System Expander enables businesses to add the system PCI connectivity they need, where and when they need it. By coupling the Netra E1 PCI system expander with Netra servers and storage products, companies can achieve the right balance of CPU, memory, storage, and I/O connectivity. The system expander provides four full-length PCI slots in a rack-ready, low-profile 1U system expander, delivering exceptional PCI card density. Plus, this ruggedized, carrier-grade system, certified to NEBS level 3, allows continuous operation in less than ideal conditions. For voice-over IP, softswitch, clustering, even general-purpose applications, the Sun Netra E1 PCI System Expander provides affordable, highly reliable I/O expansion.

One of the biggest benefits of the Netra E1 System Expander is its easy integration with Sun's extremely popular line of Netra rack mount servers and peripherals, promoting modular computing with plug-n-play installation. Now users can easily create a compute environment with just the right mix of connectivity, servers and memory that they need.

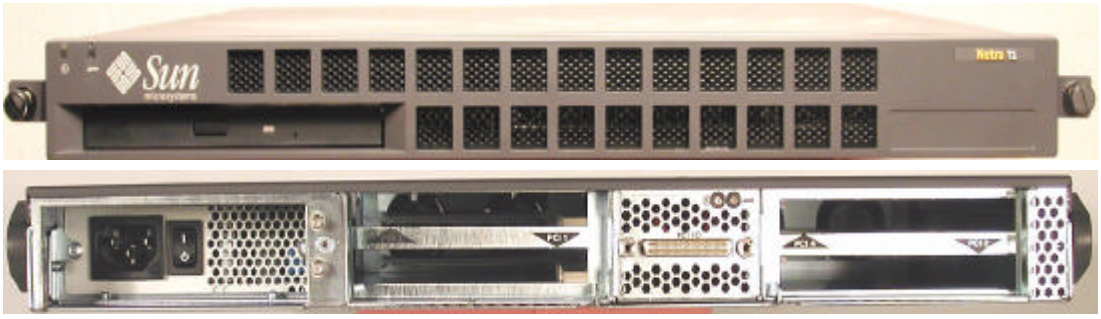

FIGURE 1-1 Netra E1 Expansion Unit Front and Rear Views

The Netra E1 PCI System Expander Unit may be used with:

- Netra t1 Model 100/105 (1 maximum)
- Netra T1 200 Servers (1 maximum)
- Netra t 1120/1125 (2 maximum)
- Netra t 1400/1405 (2 maximum)

As in the Netra T1 host system products, the Netra E1 PCI requires only 1U of vertical rack space and can be rack mounted with same rack mount option kits as the Netra T1 host systems. All cables are connected to the rear of the unit. The Netra E1 Expansion Unit is available in either an AC or DC version.

External Components

The Netra E1 Expansion Unit external components consist of:

- Host interface card
- Power and fault LEDs
- Power switch

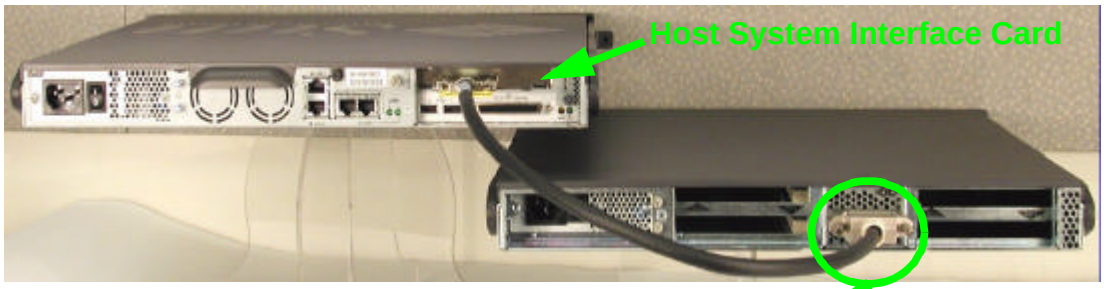

FIGURE 1-2 Netra E1 Expansion Unit Connected to a Netra T1 200 Series Server

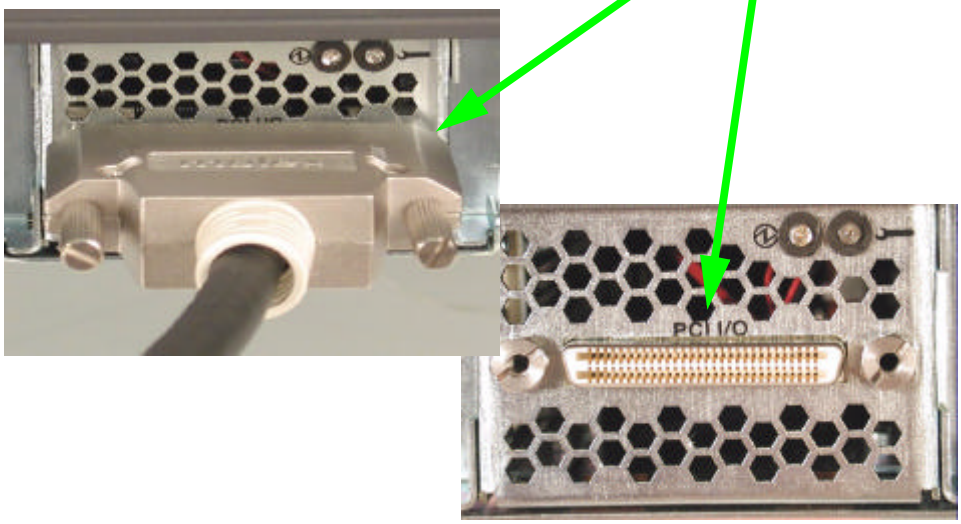

FIGURE 1-3 Host Interface Card Connector on the Netra E1 Expansion Unit

As shown in photo above, the Netra E1 Expansion Unit is connected to the host system via a host system interface PCI card installed in the host server. A single cable connects the two units together to provide the PCI expansion.

System Internal Components

The Netra E1 Expansion Unit internal components consist of:

- PCI card cage - includes PCI card slots and connectors, baseboard, riser cards, and fans
- AC or DC power supply unit
- Power Distribution Board

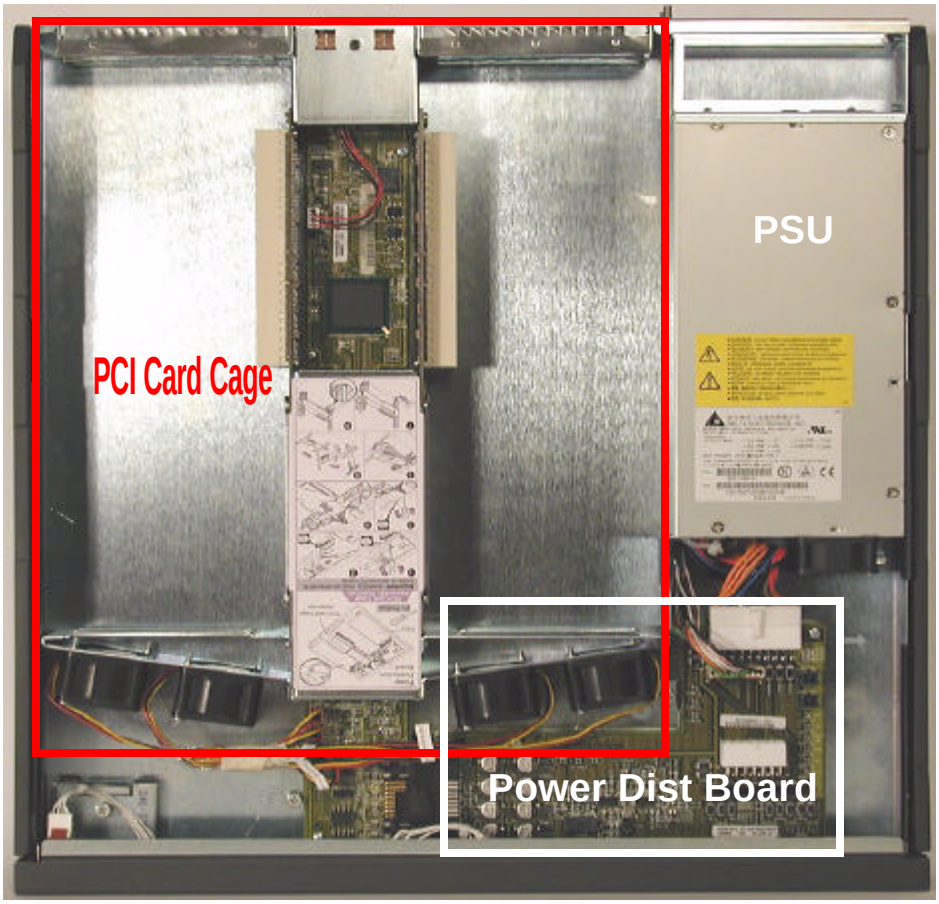

FIGURE 1-4 Netra E1 Expansion Unit Internal Components

PCI Card Cage

The PCI card cage include several components such as the PCI card connectors, riser cards, baseboard, and the on-board power distribution board connector.

- Riser Cards - mounted perpendicular to the expansion unit's baseboard, located at the bottom of the PCI card cage assembly. PCI cards are attached to the PCI card risers.
- Fans - five fans (two on each side of the PCI card cage) providing the cooling for all four PCI cards as well as the entire system. Baffling provides maximum airflow to the PCI cards.

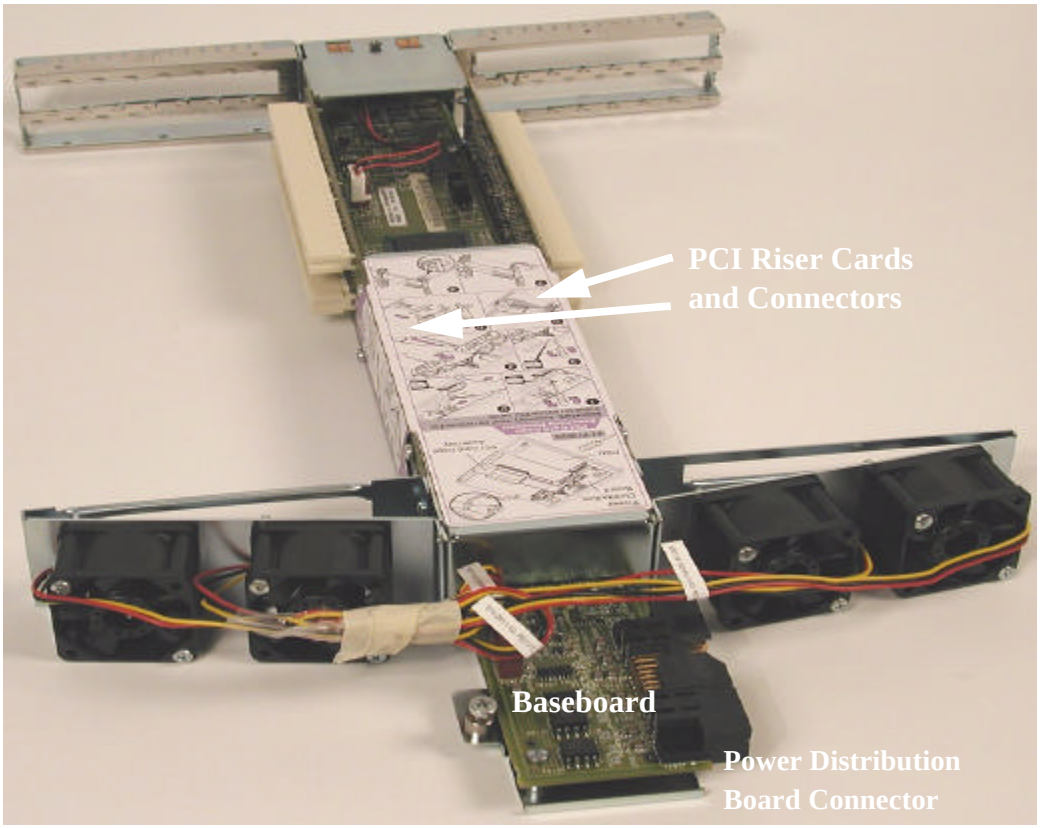

FIGURE 1-5 PCI Card Cage

Power and Fault LEDs

There are power and fault LEDs on both front and rear of the system. The LED status description is shown in table below.

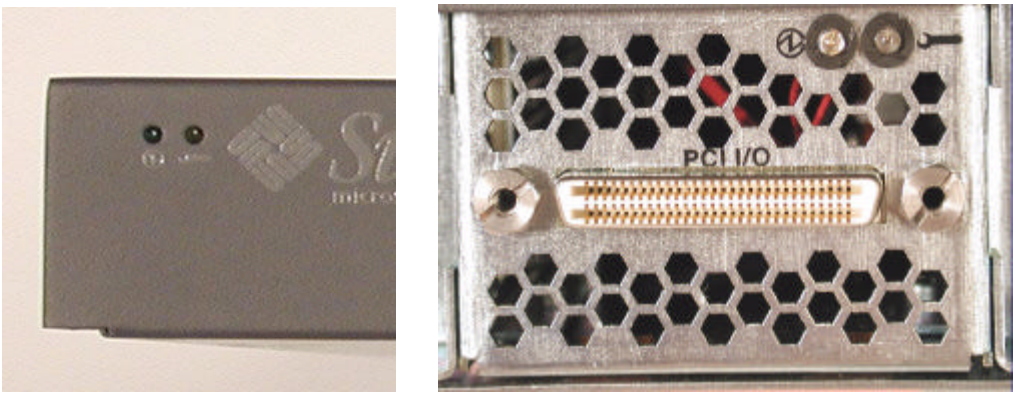

FIGURE 1-6 Power and Fault LEDs

LED Type	Off	On	Flashing
Green (Power)	Output power is off	Output power is on	Input power is connected, but output power is in a standby state or the PSU in non-operational
Amber (Fault)	OK, no system fault	1 of 4 fans has failed or PSU fan has failed, or 1 of the 2 DC inputs is not connected or has failed	2 or more failures have occurred, and/or output power is out of spec. If power is at fault, the E1 will isolate itself from the host system and the fault LED continues to flash

TABLE 1-1 Power and Fault LED Functions

There are no customer repairable components in the Netra E1 Expansion Unit. If the LEDs indicate a problem with the unit, refer to the Troubleshooting Guide or contact service representative for a replacement unit.

Power Switch

The Netra E1 Expansion Unit has a rocker type power switch to control the power supply. The switch is located on the rear of the system. The rocker switch has three positions:

- On - power supply provides power to the expansion unit
- Neutral - when the switch is released from ON position, it returns to the Neutral position and expansion unit power supply remains on.
- Standby - power supply does not provide full power to the expansion unit.

FIGURE 1-7 Power Switch

The Netra E1 Expansion Unit will power up automatically if the host interface cable is connected to the host system, or when the host system is powered up. DO NOT power off the expansion unit or disconnect the cable while the host system is running. Doing so can result in loss of data and damage to hardware.

PCI Card Installation

To facilitate ease of PCI card installation, the system has a built-in PCI card cage stablizer which allows the user to position the PCI card cage horizontally when installing PCI cards into the PCI card cage. (see photos below)

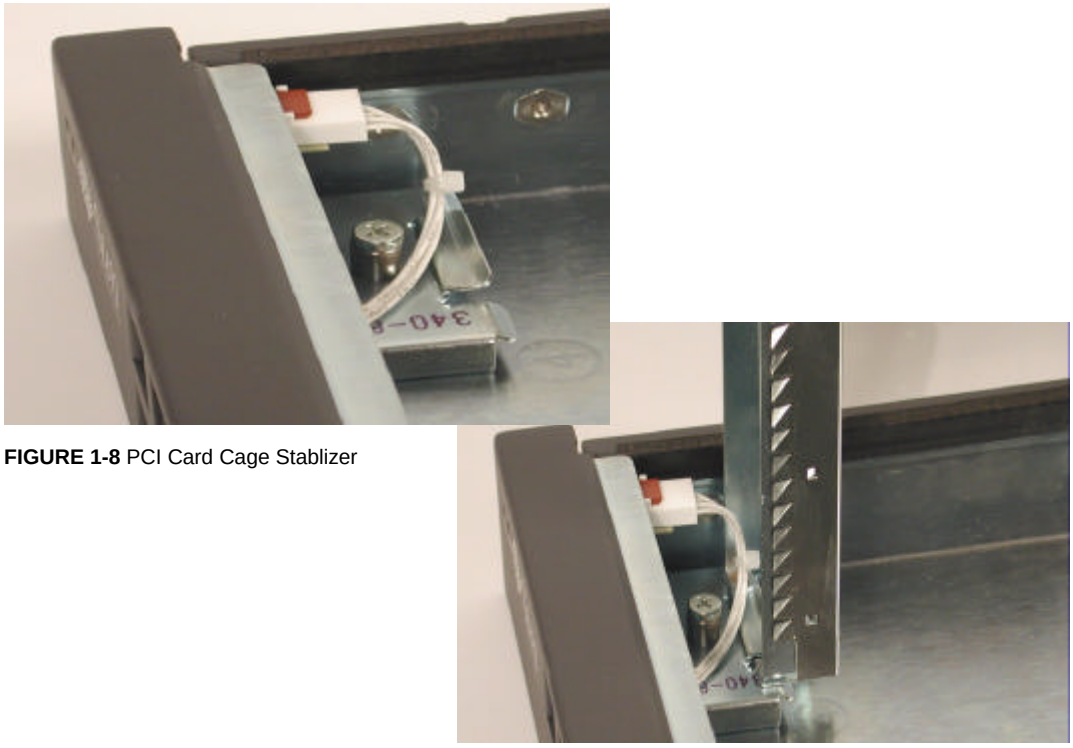

FIGURE 1-8 PCI Card Cage Stablizer

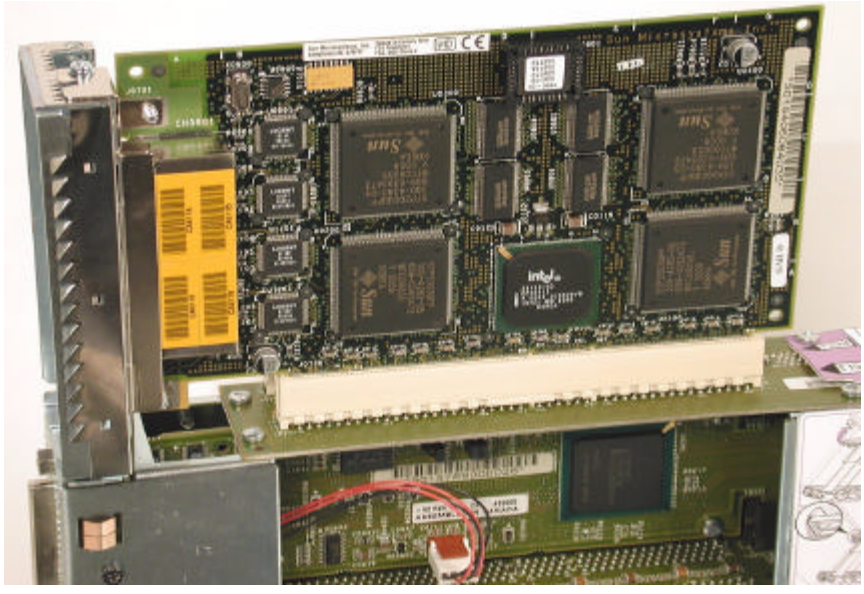

FIGURE 1-9 PCI Card Mounted in Slot

System Specifications

The following tables contain the system specs such as physical specs, environmental specs, and electrical specs.

Measure	English	Metric
Width	17.2”	436.7mm
Depth	18.7”	474.9mm
Height	1.728” (fits 1U)	43.9mm
Weight (no PCI cards)	15.04 lbs	6.83 kg
Weight (fully loaded)	17.44 lbs	7.91 kg

TABLE 1-2 System Physical Specs

Type	Location	Min to Max Range
Temperature	Operating Non-Operating	41^{o}F to 104^{o}F, 5^{o} C to 40^{o}C -40^{o}F to 158^{o}F, -40^{o} C to 70^{o}C
Relative Humidity Non-condensing	Operating Non-Operating	5% to 85% (26^{o}C max-wet bulb) 90% max @ 104^{o}F

TABLE 1-3 Environmental Specs

Electrical Element	Requirement
Voltage (nominal)	100VAC to 240VAC
Frequency	47 to 63 Hz
Local Power	+5V +/-5% +3.3V +/-5% +12V +/-5% +5V standby +/-5%
Max Input Surge Current	20 Amps peak for cold start Power dropouts >200msec 100 Amps peak for warm start Power dropouts <200msec

TABLE 1-4 AC Electrical Specs

Electrical Element	Requirement
Voltage (nominal)	-48VDC to -60VDC
Local Power	+5V +/-5% +3.3V +/-5% +12V +/-5% +5V standby +/-5%
Max Input Surge Current	20 Amps peak for cold start Power dropouts >200msec 100 Amps peak for warm start Power dropouts <200msec

TABLE 1-5 DC Electrical Specs

PCI Card Device Numbers

You can use OpenBoot PROM (OBP) `showdevs` command to verify that your host system recognizes each PCI card installed in the Netra E1 Expansion Unit. The expansion unit itself is transparent to the host system. Diagram below shows the logical and physical device numbers of the PCI cards.

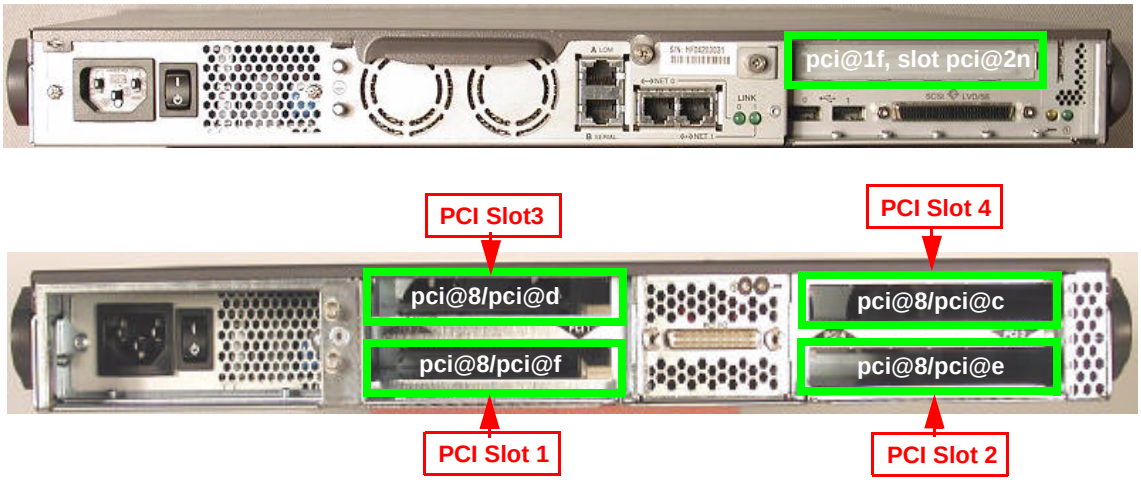

FIGURE 1-10 Logical and Physical Device Numbers

Summary

The Netra E1 PCI System Expander offers greater connectivity in a cost-effective, compact, carrier-grade solution for demanding telco, SP and commercial applications. With its easy integration with the rest of the Netra rack mount product family, including storage and I/O capabilities, the Netra E1 PCI System Expander is an important building block in achieving modular computing.

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