Netra™ t 1400 / 1405 Service and System Reference Manual

THE NETWORK IS THE COMPUTER™

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Contents

Figures

Tables

Code Samples

Preface

This manual comprises two parts:

- Part I, *Service*, is written for technicians, advanced computer system end-users with experience in replacing hardware and troubleshooting, system administrators, and authorized service providers (ASPs). Only suitably qualified service personnel may carry out tasks described in this manual that involve the removal of the top cover.
- Part II, *System Reference*, is written for OEM engineers, system designers and application programmers who have to perform advanced tasks concerned with the maintenance and configuration of the system.

How This Book Is Organized

The manual is arranged as follows:

Chapter 1 provides information about the system components and features.

Chapter 2 contains an overview of the Netra t 1400/1405 Sun VTS diagnostic tool.

Chapter 3 describes the power-on self-test (POST) diagnostics.

Chapter 4 describes how to troubleshoot possible problems and suggests corrective actions.

Chapter 5 provides a description of the tools required.

Chapter 6 describes the procedures for powering on and powering off the system, attaching the wrist strap, and removing and replacing the top access cover.

Chapter 7 describes the procedures for removing and replacing the power subassemblies.

Chapter 8 describes the procedures for removing and replacing the storage devices.

Chapter 9 describes the procedures for removing and replacing the motherboard and its components.

Chapter 10 provides information on the back panel connectors.

Chapter 11 provides information on modem specifications. Any modem compatible with CCITT V.24 can be connected to the Netra t 1400/1405.

Chapter 12 provides information about the motherboard jumpers.

Appendix A provides a functional description of the Netra t 1400/1405.

Appendix B lists the authorized replaceable parts for the Netra t 1400/1405 and briefly describes each listed component.

Appendix C provides physical, electrical and environmental specifications for the Netra t 1400/1405.

Typographic Conventions

TABLE P-1 Typographic Conventions

Typeface	Meaning	Examples
`AaBbCc123`	The names of commands, files, and directories; on-screen computer output	Edit your `.login` file. Use `ls -a` to list all files. `% You have mail.`
`AaBbCc123`	What you type, when contrasted with on-screen computer output	`% su` `Password:`
AaBbCc123	Book titles, new words or terms, words to be emphasized	Read Chapter 6 in the *User's Guide*. These are called *class* options. You *must* be superuser to do this.
	Command-line variable; replace with a real name or value	To delete a file, type `rm` *filename*.

Shell Prompts

TABLE P-2 Shell Prompts

Shell	Prompt
C shell	*machine_name*%
C shell superuser	*machine_name*#
Bourne shell and Korn shell	$
Bourne shell and Korn shell superuser	#

Related Documentation

TABLE P-3 Related Documentation

Application	Title	Part Number
Compliance and Safety	*Netra t 1400/1405 Compliance and Safety Manual*	806-0574-10
Installation and User	*Netra t 1400/1405 Installation and User's Guide*	806-0575-10

Note – It is essential that you read the Netra t 1400/1405 Compliance and Safety Manual before proceeding.

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Please include the part number of your document in the subject line of your email.

PART I Service

CHAPTER 1

System Description

The Netra t 1400/1405 computer system is a one- to four-processor device that uses the family of UltraSPARC™ II processors. Housed within a rack-mounting enclosure, the Netra t 1400/1405 provides the following:

- High performance processors
- Extensive I/O expansion and a wide range of options
- Modular internal design
- High performance disk, system, memory and I/O subsystems
- High performance peripheral component interconnect (PCI) I/O
- Redundant hot swap power supply units
- Rack mounting options available
- Alarms functionality for remote management

The Netra t 1400 is powered by –48V / –60V DC supplies. The Netra t 1405 is powered by standard AC supplies. This is the only difference between the systems.

FIGURE 1-1 and FIGURE 1-2 on page 1-3 illustrate the front and rear, respectively, of the Netra t 1400; FIGURE 1-3 and FIGURE 1-4 on page 1-4 illustrate the front and rear, respectively, of the Netra t 1405. The following sections provide a brief description of the Netra t 1400/1405 I/O devices and a detailed overview of the system unit features.

1.1 System Unit Features

System unit components are housed in a rack-mounting enclosure. Overall enclosure dimensions (width x depth x height) are 431.8mm x 477.3mm x 264mm (17.00in. x 18.79in. x 10.39in. (6U)). System unit electronics are contained on a single printed circuit board (motherboard). The motherboard contains the CPU module(s), memory, system control application-specific integrated circuits (ASICs) and I/O ASICs.

The system unit has the following features:

- Rack mounting enclosure with n + 1 redundant hot swap –48 VDC / –60 VDC (Netra t 1400) or AC (Netra t 1405) power supplies
- Support for up to four modular 440 MHz UltraSPARC II processors with 4 Mbyte cache
- UltraSPARC Port Architecture (UPA) coherent memory interconnect
- Use of DIMMs, with an interleaved memory system. Each pair of DIMM slots (four rows of two pairs each) accepts 64 or 256 Mbyte DIMM modules. Populating with two pairs of identical capacity DIMMs enables the memory controller to interleave and overlap, providing optimal system performance. There are a total of 16 DIMM slots supplying a minimum of 256 Mbyte (4 x 64 Mbyte) and a maximum of 4 Gbyte (16 x 256 Mbyte) of memory.
- Four PCI slots:
  - two 33 MHz, 64- or 32-bit, 5 VDC slots
  - one 33 MHz 32-bit only 5 VDC slot
  - one 66 MHz or 33 MHz, 64- or 32-bit, 3.3 VDC slot

  Universal PCI cards can be used in any of the four PCI slots.
- 10/100 Megabit per second (Mbps) Ethernet
- 40 Mbps Fast-20 (UltraSCSI) disk subsystem supporting up to four 18 MB disk drives
- Two RS232/423 DB-25 serial ports (asynchronous protocols)
- Parallel port
- External Fast-20 (UltraSCSI) 68-pin port
- Up to two SCSI removable media drives (CD-ROM or DAT or both)
- Alarms card implementing Lights Out Management

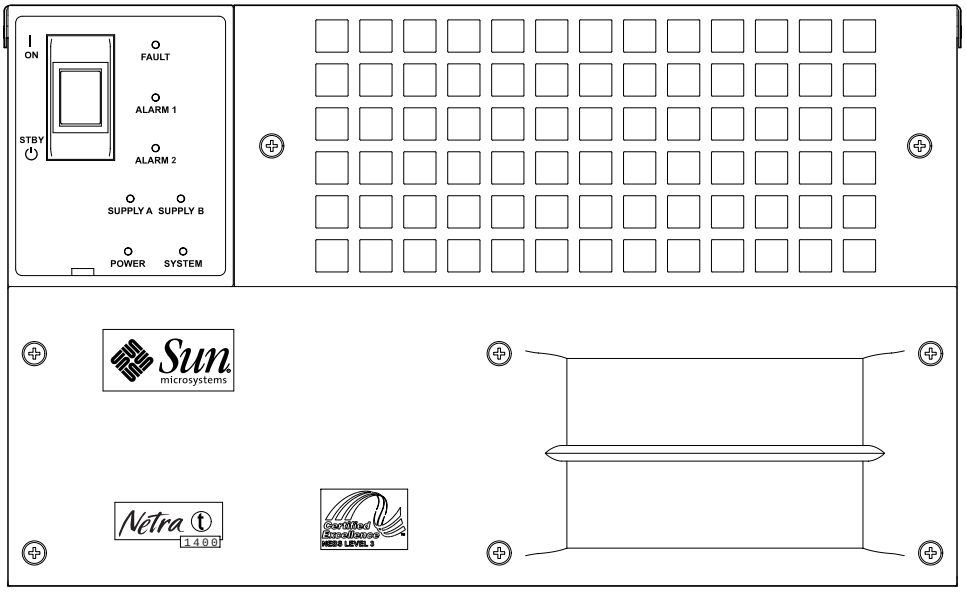

FIGURE 1-1 Netra t 1400 System Unit Front View

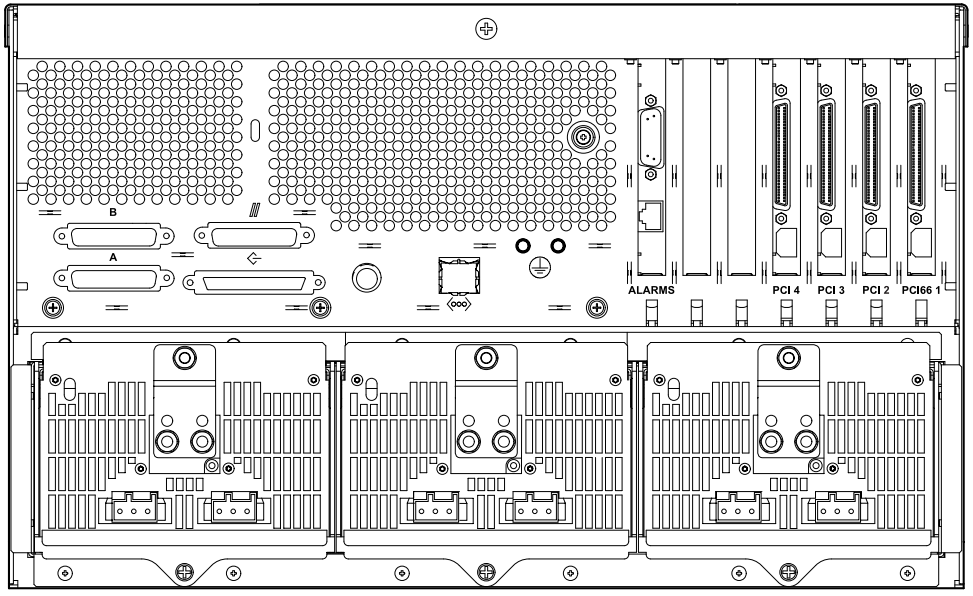

FIGURE 1-2 Netra t 1400 System Unit Rear View

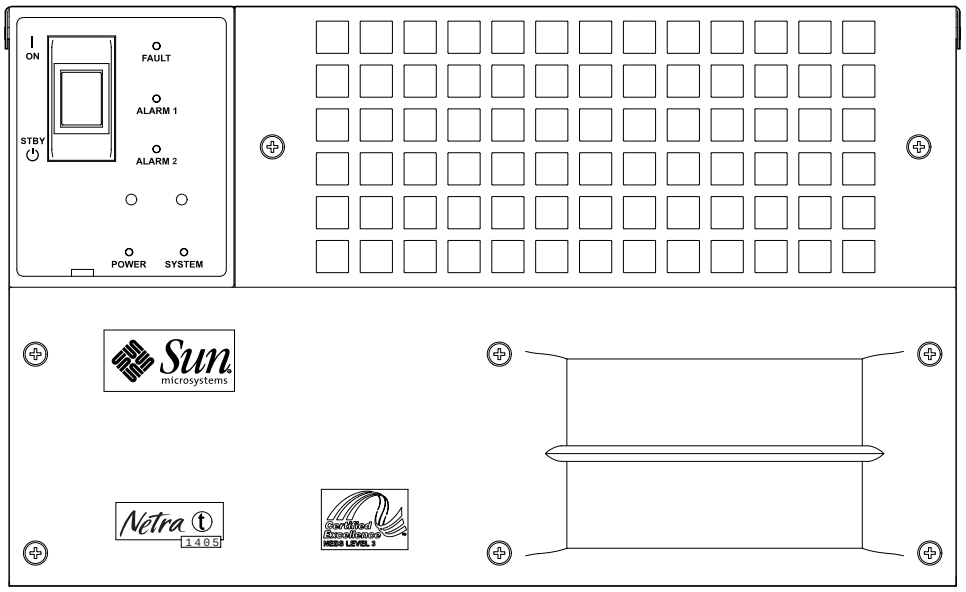

FIGURE 1-3 Netra t 1405 System Unit Front View

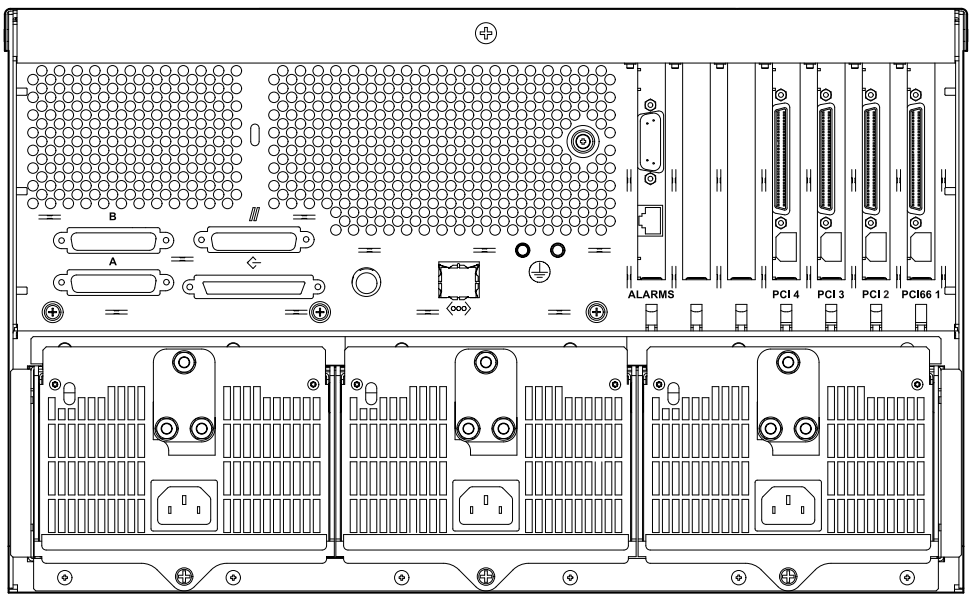

FIGURE 1-4 Netra t 1405 System Unit Rear View

1.2 System Unit Components

The system units components are listed by part number in Appendix B “Illustrated Parts List.

Note – The part numbers listed in Appendix B were correct when this manual was published but they are subject to change without notice. Numerical references illustrated in FIGURE B-1 on page B-2 correlate to the references listed in TABLE B-1 and TABLE B-2. Refer to your authorized Sun sales representative or service provider to confirm a part number prior to ordering a replacement part.

1.3 LEDs

The LEDs on the front of the Netra t 1400/1405 indicate the current status of the system.

Note – The System, Alarm and Fault LEDs can also be forced on or off by a LOM command (see the *Netra t 1400/1405 Installation and User Guide*).

1.3.1 Netra t 1400

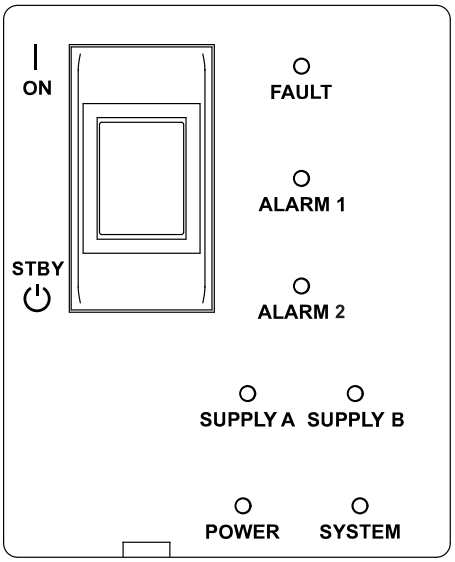

FIGURE 1-5 Netra t 1400 System LEDs

TABLE 1-1 Netra t 1400 System LED Functions

POWER	Green	Illuminated at all times when the system is on
SUPPLY A	Green	Illuminated whenever DC input A is present on all fitted PSUs
SUPPLY B	Green	Illuminated whenever DC input B is present on all fitted PSUs
SYSTEM	Green	Off (or reset) during power up procedures Illuminated whenever UNIX is running and the alarms driver is installed This LED is reset by a hardware watchdog timeout, or whenever the user-defined Alarm 3 is asserted.
ALARM 1	Amber	Illuminated whenever the user-defined Alarm 1 is asserted
ALARM 2	Amber	Illuminated whenever the user-defined Alarm 2 is asserted
FAULT	Amber	Flashes when a fan or PSU has failed Illuminated continuously when the ASR watchdog has timed out or when it is manually switched on

1.3.2 Netra t 1405

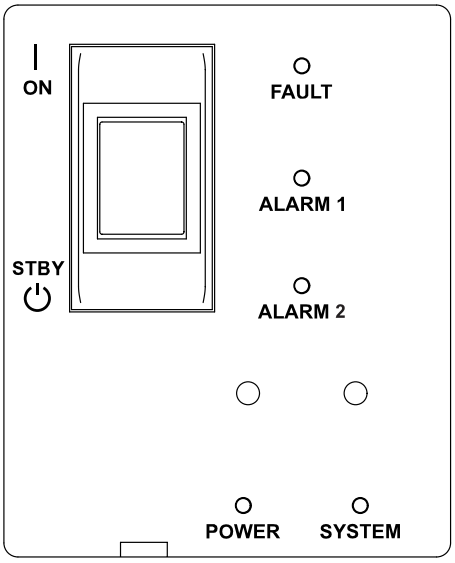

FIGURE 1-6 Netra t 1405 System LEDs

TABLE 1-2 Netra t 1405 System LED Functions

POWER	Green	Illuminated at all times when the system is on
SYSTEM	Green	Off (or reset) during power up procedures Illuminated whenever UNIX is running and the alarms driver is installed This LED is reset by a hardware watchdog timeout, or whenever the user-defined Alarm 3 is asserted.
ALARM 1	Amber	Illuminated whenever the user-defined Alarm 1 is asserted
ALARM 2	Amber	Illuminated whenever the user-defined Alarm 2 is asserted
FAULT	Amber	Flashes when a fan or PSU has failed Illuminated continuously when the ASR watchdog has timed out or when it is manually switched on

CHAPTER 2

SunVTS

This chapter contains an overview of the Netra t 1400/1405 SunVTS™ diagnostic tool.

2.1 SunVTS Description

The SunVTS software executes multiple diagnostic hardware tests from a single user interface. SunVTS verifies the configuration, functionality and reliability of most hardware controllers and devices.

2.2 SunVTS Operation

lists the documentation for the SunVTS software. These documents are available on the *Solaris on Sun Hardware AnswerBook*, which is on the *SMCC Updates CD-ROM* for the Solaris release.

SunVTS Documentation

Title	Description
SunVTS User's Guide	Describes the SunVTS environment; starting and controlling various user interfaces; feature descriptions
SunVTS Test Reference Manual	Describes each SunVTS test; provides various test options and command line arguments
SunVTS Quick Reference Card	Provides overview of `vtsui` interface features

2.3 LOMlite VTS

The procedure for installing the LOMlite software in given in chapter 5 of the *Netra t 1400/1405 Installation and User's Guide*. Note that the SunVTS software must be loaded before the LOMlite software can be installed.

For a description of the LOMlite functionality, see chapter 10 of the *Netra t 1400/1405 Installation and User's Guide.*

CHAPTER 3

Power-On Self Test

This chapter contains procedures to initiate the Netra t 1400/1405 system unit power-on self-test (POST) diagnostics. Procedures are also included to support pre-POST preparation, POST data interpretation and the bypassing of POST diagnostics.

3.1 POST Overview

POST can be used to determine if part of the system unit has failed and should be replaced. POST detects approximately 95 percent of system unit faults, and is located in the system board OpenBoot™ PROM (OBP). The setting of two NVRAM variables, the `diag-switch?` and `diag-level` flags, determines if POST is executed. TABLE 3-1 lists the `diag-switch?` and `diag-level` flag settings for disabling POST (`off`), enabling POST maximum (`max`), or enabling POST minimum (`min`).

TABLE 3-1 `diag-level` Switch Settings

`diag-level` Setting	POST Initialization	Serial Port A IO	Serial Port A Error Output	`diag-switch?` Setting
Off	No	N/A	N/A	N/A
Max	Yes (power-on)	Enabled	Enabled	True
Min	Yes (power-on)	Disabled	Enabled	True

3.2 Pre-POST Preparation

Pre-POST preparation includes:

- Setting up a `tip` connection to a workstation or terminal to view POST progress and error messages. See Section 3.2.1 “To Set Up a tip Connection” below.
- Verifying baud rates between a Netra t 1400/1405 and a terminal. See Section 3.2.2 “To Verify the Baud Rate” on page 3-3”.

3.2.1 To Set Up a `tip` Connection

A `tip` connection enables a remote shell window to be used as a terminal to display test data from a system being tested. Serial ports A or B are used to establish the `tip` connection between the system unit being tested and a Sun workstation monitor or TTY-type terminal. The `tip` connection is used in a SunOS window and provides features to help with the OBP.

1. **Connect serial port A of the system being tested to a Sun workstation serial port B using a serial null modem cable (connect cable pins 2-3, 3-2, 7-20, and 20-7).**
2. **At the Sun workstation, check the `/etc/remote` file:**

```
hardwire:\
    :dv=/dev/term/b:br#9600:el=^C^S^Q^U^D:ie=%$:oe=^D:
```

Note – The example shows connection to serial port B, `ttyb`.

3. **To use serial port A:**

   a. **Copy and paste the following:**

```
hardwire:\
    :dv=/dev/term/b:br#9600:el=^C^S^Q^U^D:ie=%$:oe=^D:
```

   b. **Then modify as follows:**

```
hardwire:\
    :dv=/dev/term/a:br#9600:el=^C^S^Q^U^D:ie=%$:oe=^D:
```

4. **In a Shell Tool window on the Sun workstation, type `tip hardwire`. Verify the response:**

```
hostname% tip hardwire
connected
```

Note – The shell window is now a `tip` window directed to the serial port of the system unit being tested. When power is applied to the system unit being tested, POST messages will be displayed in this window.

---

5. **When POST is completed, disconnect the `tip` window by typing `~.` (tilde+period).**

3.2.2 To Verify the Baud Rate

To verify the baud rate between the system unit being tested and a terminal or a Sun workstation monitor:

1. **Open a Shell Tool.**
2. **Type `eeprom`.**
3. **Verify the following serial port default settings as follows:**

```
ttyb-mode = 9600,8,n,1
ttya-mode = 9600,8,n,1
```

Note – Ensure that the settings are consistent with TTY-type terminal or workstation monitor settings.

3.3 To Initialize POST

POST is initialized by setting `diag-switch?` to `true` and `diag-level` to `max` or `min`, followed by power cycling the system unit.

1. **At the system prompt, type:**

```
setenv diag-switch? true
```

2. **When the POST is complete, set `diag-switch?` to `false` (default setting).**

3.4 Maximum and Minimum Levels of POST

Two levels of POST are available: maximum (`max`) level and minimum (`min`) level. The system initiates the selected level of POST based on the setting of `diag-level`, an NVRAM variable.

The default setting for `diag-level` is `max`. An example of a `max` level POST output on serial port A is provided in Section 3.4.1 “diag-level Variable Set to max” on page 3-5”. An example of a `min` level POST output on serial port A is provided in Section 3.4.2 “diag-level Variable Set to min” on page 3-10”.

To set `diag-level` to `min`, type:

```
ok setenv diag-level min
```

To return to the default setting:

```
ok setenv diag-level max
```

3.4.1 `diag-level` Variable Set to `max`

When the `diag-level` variable is set to `max`, POST enables an extended set of diagnostic-level tests. CODE EXAMPLE 3-1 identifies a typical serial port A POST output with `diag-level` set to `max`.

CODE EXAMPLE 3-1 `diag-level` Variable Set to `max`

```
Hardware Power ON
Master CPU : 0000.0000.0055.11a0
Slave  CPU : 0000.0001.0055.11a0
Slave  CPU : 0000.0002.0055.11a0
Slave  CPU : 0000.0003.0055.11a0
Master  E$ : 0000.0000.0040.0000
Slave   E$ : 0000.0000.0040.0000
Slave   E$ : 0000.0000.0040.0000
Slave   E$ : 0000.0000.0040.0000

Button Power ON
Master CPU : 0000.0000.0055.11a0
Slave  CPU : 0000.0001.0055.11a0
Slave  CPU : 0000.0002.0055.11a0
Slave  CPU : 0000.0003.0055.11a0
Master  E$ : 0000.0000.0040.0000
Slave   E$ : 0000.0000.0040.0000
Slave   E$ : 0000.0000.0040.0000
Slave   E$ : 0000.0000.0040.0000

Probing keyboard Done
Executing Power On SelfTest
0>
0>@(#) Sun Ultra 80(UltraSPARC-II 4-way) UPA/PCI POST 1.2.6 04/23/
1999 07:10 PM
0>INFO: Processor 0 is master. CPU 440 MHz. 5760KB Ecache.
0>
0> <00> Init System BSS
0> <00> NVRAM Battery Detect Test
0> <00> NVRAM Scratch Addr Test
0> <00> DMMU TLB Tag Access Test
0> <00> DMMU TLB RAM Access Test
0> <00> IMMU TLB Tag Access Test
0> <00> IMMU TLB RAM Access Test
0> <00> Probe Ecache
0> <00> Ecache RAM Addr Test
0> <00> Ecache Tag Addr Test
0> <00> Ecache Tag Test
0> <00> Invalidate Ecache Tags
0>INFO: Processor 1 - UltraSPARC-II.
```

CODE EXAMPLE 3-1 `diag-level` Variable Set to `max` *(Continued)*

```
Hardware Power ON
0>INFO: Processor 2 - UltraSPARC-II.
0>INFO: Processor 3 - UltraSPARC-II.
0> <00> Init SC Regs
0> <00> SC Address Reg Test
0> <00> SC Reg Index Test
0> <00> SC Regs Test
0> <00> SC Dtag RAM Addr Test
0> <00> SC Cache Size Init
0> <00> SC Dtag RAM Data Test
0> <00> SC Dtag Init
0> <00> Probe Memory
0>INFO: 1024MB Bank 0
0>INFO:    0MB Bank 1
0>INFO:    0MB Bank 2
0>INFO:    0MB Bank 3
0> <00> Malloc Post Memory
0> <00> Init Post Memory
0> <00> Post Memory Addr Test
0> <00> Map PROM/STACK/NVRAM in DMMU
0> <00> Memory Stack Test
3> <00> DMMU TLB Tag Access Test
1> <00> DMMU TLB Tag Access Test
2> <00> DMMU TLB Tag Access Test
3> <00> DMMU TLB RAM Access Test
2> <00> DMMU TLB RAM Access Test
1> <00> DMMU TLB RAM Access Test
3> <00> IMMU TLB Tag Access Test
2> <00> IMMU TLB Tag Access Test
1> <00> IMMU TLB Tag Access Test
3> <00> IMMU TLB RAM Access Test
2> <00> IMMU TLB RAM Access Test
1> <00> IMMU TLB RAM Access Test
3> <00> Probe Ecache
2> <00> Probe Ecache
3> <00> Ecache RAM Addr Test
2> <00> Ecache RAM Addr Test
1> <00> Probe Ecache
3> <00> Ecache Tag Addr Test
2> <00> Ecache Tag Addr Test
1> <00> Ecache RAM Addr Test
3> <00> Ecache Tag Test
2> <00> Ecache Tag Test
1> <00> Ecache Tag Addr Test
1> <00> Ecache Tag Test
3> <00> Invalidate Ecache Tags
2> <00> Invalidate Ecache Tags
```

CODE EXAMPLE 3-1 `diag-level` Variable Set to `max` *(Continued)*

```
Hardware Power ON
1> <00> Invalidate Ecache Tags
3> <00> Map PROM/STACK/NVRAM in DMMU
2> <00> Map PROM/STACK/NVRAM in DMMU
3> <00> Update Slave Stack/Frame Ptrs
1> <00> Map PROM/STACK/NVRAM in DMMU
2> <00> Update Slave Stack/Frame Ptrs
0> <00> DMMU Hit/Miss Test
1> <00> Update Slave Stack/Frame Ptrs
0> <00> IMMU Hit/Miss Test
0> <00> DMMU Little Endian Test
0> <00> IU ASI Access Test
0> <00> FPU ASI Access Test
3> <00> DMMU Hit/Miss Test
1> <00> DMMU Hit/Miss Test
2> <00> DMMU Hit/Miss Test
3> <00> IMMU Hit/Miss Test
1> <00> IMMU Hit/Miss Test
2> <00> IMMU Hit/Miss Test
3> <00> DMMU Little Endian Test
1> <00> DMMU Little Endian Test
2> <00> DMMU Little Endian Test
3> <00> IU ASI Access Test
1> <00> IU ASI Access Test
2> <00> IU ASI Access Test
3> <00> FPU ASI Access Test
1> <00> FPU ASI Access Test
2> <00> FPU ASI Access Test
3> <00> Dcache RAM Test
2> <00> Dcache RAM Test
1> <00> Dcache RAM Test
3> <00> Dcache Tag Test
2> <00> Dcache Tag Test
1> <00> Dcache Tag Test
3> <00> Icache RAM Test
2> <00> Icache RAM Test
1> <00> Icache RAM Test
3> <00> Icache Tag Test
2> <00> Icache Tag Test
1> <00> Icache Tag Test
3> <00> Icache Next Test
2> <00> Icache Next Test
1> <00> Icache Next Test
3> <00> Icache Predecode Test
2> <00> Icache Predecode Test
1> <00> Icache Predecode Test
0> <1f> Init Psycho
```

CODE EXAMPLE 3-1 `diag-level` Variable Set to `max` *(Continued)*

```
Hardware Power ON
0> <1f> PIO Read Error, Master Abort Test
0> <1f> PIO Read Error, Target Abort Test
0> <1f> PIO Write Error, Master Abort Test
0> <1f> PIO Write Error, Target Abort Test
0> <1f> Timer Increment Test
0> <1f> Init Psycho
0> <1f> Consistent DMA UE ECC Rd Err Lpbk Test
0> <1f> Pass-Thru DMA UE ECC Rd Err Lpbk Test
0> <00> V9 Instruction Test
0> <00> CPU Tick and Tick Compare Reg Test
0> <00> CPU Soft Trap Test
0> <00> CPU Softint Reg and Int Test
3> <00> V9 Instruction Test
1> <00> V9 Instruction Test
2> <00> V9 Instruction Test
3> <00> CPU Tick and Tick Compare Reg Test
1> <00> CPU Tick and Tick Compare Reg Test
2> <00> CPU Tick and Tick Compare Reg Test
0> <00> UltraSPARC-2 Prefetch Instructions Test
0> <00> Test 0: prefetch_mr
0> <00> Test 1: prefetch to non-cacheable page
0> <00> Test 2: prefetch to page with dmmu misss
0> <00> Test 3: prefetch miss does not check alignment
0> <00> Test 4: prefetcha with asi 0x4c is noped
0> <00> Test 5: prefetcha with asi 0x54 is noped
0> <00> Test 6: prefetcha with asi 0x6e is noped
0> <00> Test 7: prefetcha with asi 0x76 is noped
0> <00> Test 8: prefetch with fcn 5
0> <00> Test 9: prefetch with fcn 2
0> <00> Test 10: prefetch with fcn 12
0> <00> Test 11: prefetch with fcn 16 is noped
0> <00> Test 12: prefetch with fcn 29 is noped
0> <00> Test 13: prefetcha with asi 0x15 is noped
0> <00> Test 14: prefetch with fcn 3
0> <00> Test 15: prefetcha14 with fcn 2
0> <00> Test 16: prefetcha80_mr
0> <00> Test 17: prefetcha81_1r
0> <00> Test 18: prefetcha10_mw
0> <00> Test 19: prefetcha80_17 is noped
0> <00> Test 20: prefetcha10_6: illegal instruction trap
0> <00> Test 21: prefetcha11_1w
0> <00> Test 22: prefetcha81_31
0> <00> Test 23: prefetcha11_15: illegal instruction trap
0>STATUS =PASSED
```

CODE EXAMPLE 3-1 `diag-level` Variable Set to `max` *(Continued)*

```
Hardware Power ON
Power On Selftest Completed
ú   Status  = 0000.0000.0000.0000 ffff.ffff.f00b.3ea0
ff9f.ffff.0bd1.1111
Software Power ON
Master CPU : 0000.0000.0055.11a0
Slave  CPU : 0000.0001.0055.11a0
Slave  CPU : 0000.0002.0055.11a0
Slave  CPU : 0000.0003.0055.11a0
Master  E$ : 0000.0000.0040.0000
Slave   E$ : 0000.0000.0040.0000
Slave   E$ : 0000.0000.0040.0000
Slave   E$ : 0000.0000.0040.0000

@(#) Sun Ultra 80 UPA/PCI  3.21 Version 2 created 1999/05/06 15:39
Clearing DTAGS Done
Probing Memory
CONFIG   =  0000.0000.0000.0010
MEM BASE =  0000.0000.0000.0000
MEM SIZE =  0000.0000.4000.0000
MMUs ON
Copy Done
PC = 0000.01ff.f000.2a60
PC = 0000.0000.0000.2aa4
Decompressing into Memory Done
Size = 0000.0000.0006.ed70
ttya initialized
SC Control: EWP:0 IAP:0 FATAL:0 WAKEUP:0 BXIR:0 BPOR:0 SXIR:0
SPOR:1 POR:0
Probing Memory Bank #0 256 256 256 256 :   1 Gigabytes
Probing Memory Bank #1   0   0   0   0 :   0 Megabytes
Probing Memory Bank #2   0   0   0   0 :   0 Megabytes
Probing Memory Bank #3   0   0   0   0 :   0 Megabytes
Probing Floppy: No drives detected
Probing EBUS SUNW,lom
Probing UPA Slot at 1e,0 Nothing there
Probing UPA Slot at 1d,0 Nothing there
Probing /pci@1f,4000 at Device 1  pci108e,1000 network
Probing /pci@1f,4000 at Device 3  scsi disk tape scsi disk tape
Probing /pci@1f,4000 at Device 2  pci1214,334
Probing /pci@1f,4000 at Device 4  pci1214,334
Probing /pci@1f,4000 at Device 5  pci1214,334
Probing /pci@1f,2000 at Device 1  pci114f,1c
Probing /pci@1f,2000 at Device 2  Nothing there
screen not found.
Can’t open input device.
Keyboard not present.  Using ttya for input and output.
```

CODE EXAMPLE 3-1 `diag-level` Variable Set to `max` *(Continued)*

```
Hardware Power ON
SC Control: EWP:0 IAP:0 FATAL:0 WAKEUP:0 BXIR:0 BPOR:0 SXIR:0
SPOR:1 POR:0
Probing Memory Bank #0 256 256 256 256 :   1 Gigabytes
Probing Memory Bank #1   0   0   0   0 :   0 Megabytes
Probing Memory Bank #2   0   0   0   0 :   0 Megabytes
Probing Memory Bank #3   0   0   0   0 :   0 Megabytes
Probing Floppy: No drives detected
Probing EBUS SUNW,lom
Probing UPA Slot at 1e,0 Nothing there
Probing UPA Slot at 1d,0 Nothing there
Probing /pci@1f,4000 at Device 1  pci108e,1000 network
Probing /pci@1f,4000 at Device 3  scsi disk tape scsi disk tape
Probing /pci@1f,4000 at Device 2  pci1214,334
Probing /pci@1f,4000 at Device 4  pci1214,334
Probing /pci@1f,4000 at Device 5  pci1214,334
Probing /pci@1f,2000 at Device 1  pci114f,1c
Probing /pci@1f,2000 at Device 2  Nothing there

Sun Ultra 80 UPA/PCI (4 X UltraSPARC-II 440MHz), No Keyboard
OpenBoot 3.21, 1024 MB memory installed, Serial #10658904.
Ethernet address 8:0:20:a2:a4:58, Host ID: 80a2a458.
```

3.4.2 `diag-level` Variable Set to `min`

When `diag-level` is set to `min`, POST enables an abbreviated set of diagnostic-level tests. CODE EXAMPLE 3-2 identifies a serial port A POST output with `diag-level` set to `min`.

CODE EXAMPLE 3-2 `diag-level` Variable Set to `min`

```
screen not found.
Can't open input device.
Keyboard not present.  Using ttya for input and output.

Sun Ultra 80 UPA/PCI (4 X UltraSPARC-II 440MHz), No Keyboard
OpenBoot 3.21, 1024 MB memory installed, Serial #10658904.
Ethernet address 8:0:20:a2:a4:58, Host ID: 80a2a458.
```

3.5 POST Progress and Error Reporting

While POST is initialized, POST progress indications are visible when a TTY-type terminal or a `tip` line is connected between serial port A (default port) of the system being tested and a POST monitoring system.

If an error occurs during execution, POST attempts to send a failure message to the POST monitoring system. CODE EXAMPLE 3-3 identifies the typical appearance of a failure message.

CODE EXAMPLE 3-3 Typical POST Failure Message

```
Hardware Power ON
Master CPU : 0000.0000.0055.11a0
Slave  CPU : 0000.0001.0055.11a0
Slave  CPU : 0000.0002.0055.11a0
Slave  CPU : 0000.0003.0055.11a0
Master  E$ : 0000.0000.0040.0000
Slave   E$ : 0000.0000.0040.0000
Slave   E$ : 0000.0000.0040.0000
Slave   E$ : 0000.0000.0040.0000

Button Power ON
Master CPU : 0000.0000.0055.11a0
Slave  CPU : 0000.0001.0055.11a0
Slave  CPU : 0000.0002.0055.11a0
Slave  CPU : 0000.0003.0055.11a0
Master  E$ : 0000.0000.0040.0000
Slave   E$ : 0000.0000.0040.0000
Slave   E$ : 0000.0000.0040.0000
Slave   E$ : 0000.0000.0040.0000

Probing keyboard Done
Executing Power On SelfTest
0>
0>@(#) Sun Ultra 80(UltraSPARC-II 4-way) UPA/PCI POST 1.2.6 04/23/
1999 07:10 PM
0>INFO: Processor 0 is master. CPU 440 MHz. 4304KB Ecache.
0>
0> <00> Init System BSS
0> <00> NVRAM Battery Detect Test
0> <00> NVRAM Scratch Addr Test
0> <00> DMMU TLB Tag Access Test
0> <00> DMMU TLB RAM Access Test
0> <00> IMMU TLB Tag Access Test
0> <00> IMMU TLB RAM Access Test
```

CODE EXAMPLE 3-3 Typical POST Failure Message *(Continued)*

```
Hardware Power ON
0> <00> Probe Ecache
0> <00> Ecache RAM Addr Test
0> <00> Ecache Tag Addr Test
0> <00> Ecache Tag Test
0> <00> Invalidate Ecache Tags
0>INFO: Processor 1 - UltraSPARC-II.
0>INFO: Processor 2 - UltraSPARC-II.
0>INFO: Processor 3 - UltraSPARC-II.
0> <00> Init SC Regs
0> <00> SC Address Reg Test
0> <00> SC Reg Index Test
0> <00> SC Regs Test
0> <00> SC Dtag RAM Addr Test
0> <00> SC Cache Size Init
0> <00> SC Dtag RAM Data Test
0> <00> SC Dtag Init
0> <00> Probe Memory
0>WARNING:      SIMM missing in Bank 0, Addr = 00000000.00000000
0>INFO:    0MB Bank 0
0>INFO:    0MB Bank 1
0>INFO:    0MB Bank 2
0>INFO:    0MB Bank 3
0>STATUS =FAILED
0>TEST   =SC Dtag Init
TTF    =0
PASSES =1
ERRORS =1
SUSPECT=System Failure
0>MESSAGE=No Memory Detected
0> <00> Malloc Post Memory
0>STATUS =FAILED
0>TEST   =Malloc Post Memory
TTF    =0
PASSES =1
ERRORS =1
SUSPECT=SIMM U1301
0>MESSAGE=Can't Malloc Memory for Post <00>     Memory Stack Test
0>STATUS =FAILED
0>TEST   =Malloc Post Memory
TTF    =0
PASSES =1
ERRORS =1
SUSPECT=SIMM U1301
0>MESSAGE=Memory compare error
        addr 00000000.007f8098
        exp  00000000.007f8098
```

CODE EXAMPLE 3-3 Typical POST Failure Message *(Continued)*

```
Hardware Power ON
        obs  00100010.00000000
0>ERROR: Stack memory test failed, psycho and memory testing will
produce
unreliable results.
```

Note – The system does not automatically boot if a POST error occurs; it halts at the `ok` prompt to alert the user of a failure.

3.6 Motherboard Test

To initialize the motherboard POST:

1. **If Solaris is running, perform either a. or b. below**:

   a. From a terminal connected to ttyA, issue a `break` command to enter OBP, or

   b. From a `tip` hardwire connection, send a `break` command.

2. **At the OK prompt, type**:

```
setenv diag-level max
setenv diag-switch? true
reset-all
```

The system will now reset and commence POST.

CHAPTER 4

Troubleshooting

This chapter describes how to troubleshoot possible problems with the Netra t 1400/1405 system unit and includes suggested corrective actions. To follow these troubleshooting procedures, a terminal should be connected to the Netra t 1400/1405 system serial port A.

Several processes, notably those involving Power and Fans modules, can be diagnosed using the LightsOut Management (LOM) facility. For details refer to the *Netra t 1400/1405 Installation and User's Guide* (part number 806-0575-10).

4.1 Power-On Failure

This section provides examples of power-on failure symptoms and suggested actions.

Symptom

The system does not power up when the power switch is pressed.

Action

Check that:

- The input power connectors are correctly fitted
- External circuit breakers are correctly set
- A minimum of two functioning PSUs are present

Press the power switch at the front of the system unit. If the system powers on, no further action is required. If the system does not power on, one of the CPU modules may not be properly seated. Remove the top cover and inspect each CPU module for proper seating. If the system powers on, no further action is required.

If the input AC or DC power has been verified, each CPU module is properly seated, and the power-on key has been pressed but the system does not power up, the system power supply may be defective. See Section 4.3 “Power Subsystem Failure” on page 4-4”.

4.2 Disk Drive or Removable Media Drive Failure

This section provides disk drive and removable media drive failure symptoms and suggested actions.

Symptom

- A disk drive read, write or parity error is reported by the operating system or customer application.
- A removable media drive read error or parity error is reported by the operating system or customer application.

Action

- Check the data cables between the SCSI Disk, DAT Tape or CD-ROM drive and the adapter card.
- If the fault persists, replace the drive indicated by the failure message. The operating system identifies the internal drives as identified in TABLE 4-1.

TABLE 4-1 Internal Drive Identification

Operating System Address	Drive Physical Location and Target
c0t0d0s#	Left-most location SCSI Disk, target 0
c0t1d0s#	SCSI Disk, target 1 (optional)
c0t2d0s#	SCSI Disk, target 2 (optional)
c0t3d0s#	Right-most SCSI Disk, target 3 (optional)
c0t4d0s#	DAT Tape drive, target 4 (optional)
c0t6d0s#	CD-ROM drive, target 6 (optional)

Note – The # symbol in the operating system address examples will be a numeral between 0 and 7 that describes the slice or partition on the drive.

Symptom

Disk drive or removable media drive fails to respond to commands.

Note – If POST is to be bypassed, type **`setenv diag-switch? false`** at the `ok` prompt.

Action

Test the drive response to the `probe-scsi` command as follows:

- At the system `ok` prompt:

a. Type `reset-all`

b. Type `probe-scsi`

If the drives respond and a message is displayed, the system SCSI controller has successfully probed the devices. This indicates that the system board is operating correctly. If one drive does not respond to the SCSI controller probe but the others do, replace the unresponsive drive (see Section 8.1 “Hard Disk Drive” on page 8-1”).

If one internal disk drive is configured with the system and the `probe-scsi` test fails to show the device in the message, replace the drive (see Section 8.1 “Hard Disk Drive” on page 8-1”).

If the problem is still evident after replacing the drive, replace the SCSI adapter card assembly (see Section 8.3 “SCSI Adapter Card” on page 8-7”).

If replacing both the disk drive and the SCSI adapter card does not correct the problem, replace the motherboard (see Chapter 9 “Motherboard and Component Replacement”).

4.3 Power Subsystem Failure

This section provides PSU failure symptoms and suggested actions.

If a PSU failure is suspected:

- Check the status of the Fault LED and the LOM event log (see the *Netra t 1400/1405 Installation and User’s Guide*, part number 806-0857-10).
- Check the status of LED on the rear of the PSU. Green indicates that the PSU is working correctly; amber indicates that the input supply is connected but the PSU is faulty.

If the PSU is functioning correctly, the fault may be in the cabling. Check the connections and cabling between the PDB and motherboard, fans distribution board and SCSI adapter card.

Failure to power on may also be due to a short circuit.

CHAPTER 5

Tool Requirements

This chapter lists the tools required to service the Netra t 1400/1405 system:

- No.1 and No.2 Phillips-head screwdriver
- Antistatic wrist strap
- Digital voltage meter (DVM)
- Antistatic mat
- Riser card torque tool (part number 340-6091)

Place ESD-sensitive components such as system board, circuit cards, disk drives and NVRAM/TOD on an antistatic mat.