

PART II Remote and Local Management

---



## Managing the Netra X1 Server From the `lom>` Prompt

---

This chapter introduces the LOMlite2 Lights-Out Management (LOM) facilities available for the Netra X1 server and describes how to use the `/usr/sbin/lom` utility, which provides a user interface to the device. The chapter contains the following sections:

- “Introduction to Lights-Out Management” on page 41
- “Powering On or Resetting the Server From the LOMlite2 Shell” on page 43
- “Monitoring the Server From the LOMlite2 Shell” on page 47
- “Setting Up LOMlite2 Privileges for Named Users” on page 52
- “Setting the LOMlite2 Device’s Configurable Variables” on page 56
- “Separating LOMlite2 From the Console on the Serial A/LOM Port” on page 59
- “Viewing Event Reports That LOMlite2 Sends to `syslogd`” on page 60
- “LOMlite2 Shell Command List” on page 61

---

**Note** – For information about how to configure the LOMlite2 device-driver, see Appendix B.

---

---

## Introduction to Lights-Out Management

Lights Out Management (LOM) commands allow you to remotely manage a server that is deployed in a “lights-out” environment. You can also use LOM commands to perform quick onsite management tasks at a locally connected terminal.

LOM commands allow you to:

- Power the server on or to standby mode.
- Monitor the server's temperature and the status of its power supply, fans, internal voltage rails, fault LED, and alarms, even when the server is in standby mode.
- Turn a Fault LED on.
- Configure the server to restart automatically after a lockup.

These LOM facilities are provided by the LOMlite2 device, which in the Netra X1 server is contained on the system board. As long as the server is connected to a power supply, but not powered on, you will see the `lom>` prompt at your terminal. This is because the LOMlite2 device uses standby power and remains active even when the server is not powered on.

There are two ways to interrogate the LOMlite2 device or to send it commands to perform. You can do either of the following:

- Issue LOMlite2 commands from the `lom>` shell prompt. (Explained in this chapter.)
- Issue LOMlite2-specific Solaris commands from the console prompt. (Explained in Chapter 6.)

---

## Using LOMlite2 Commands

To use the LOM facilities either remotely or locally, establish a terminal connection to the Serial A/LOM port on the server. For details on how to do this, see "Setting Up a Console Connection to the Server" on page 16.

With the server connected to a power source but not powered on, and with a terminal connected to the Serial A/LOM port, you will see the `lom>` prompt.

When you power on the server, the prompt will change to the Solaris console prompt. For details on how to get back to the `lom>` prompt, see "To Display the `lom>` Prompt" on page 43.

---

# Powering On or Resetting the Server From the LOMlite2 Shell

---

**Note** – When the Netra X1 server is connected to a power supply, it is always either fully powered on or in standby mode. To remove power entirely from the server you must disconnect its power cables or open all external circuit breakers. The methods referred to in this chapter for powering the server on and off by using `lom>` prompt commands are methods either of powering the server on or returning it to standby power mode. The `poweroff` command does not power the server off completely.

---

---

**Note** – All commands that involve powering on or off, resetting, or specifying the boot mode of the server require you or the named user to have `r`-level LOMlite2 user permission. If you have not set up any named users of the LOMlite2 device, then you have `r`-level permission by default. If you have set up one or more named users, then you must explicitly give them `r`-level permission to use these commands. For more information about user privileges, see “Setting Up LOMlite2 Privileges for Named Users” on page 52.

---

## ▼ To Power On the Server or to Power Down to Standby Mode

- To power on the server, type:

```
lom> poweron
```

- To power the server down to standby mode, type:

```
lom> poweroff
```

## ▼ To Display the `lom>` Prompt

- To display the `lom>` prompt, type the following LOMlite2 escape sequence:

```
# #.
```

When you type the LOMlite2 escape sequence, the LOMlite2 device takes control of the Serial A/LOM port and the `lom>` prompt appears on your terminal screen. You can type the LOMlite2 escape sequence at any time.

---

**Note** – If you are at the console and you type the first character of the LOM escape sequence (by default this is #), there is a delay of one second before the character appears on the screen. This is because the server waits to see if you type the dot (.) character next. If you do, the `lom>` prompt is displayed. If you do not, the # character appears on the screen.

---

For information about changing the first character of the LOMlite2 escape sequence, see “To Change the First Character of the Sequence for Escaping to the `lom>` Prompt (`lom -X`)” on page 76.

## ▼ To Exit From the `lom>` Prompt

- To return to the Solaris console prompt from the `lom>` prompt, type:

```
lom> console
```

---

**Note** – If you have the Serial A/LOM port dedicated to the LOMlite2 device (instead of shared between the LOMlite2 and the console), this command will have no effect. For information about dedicating the Serial A/LOM port to the LOMlite2 device, see “Separating LOMlite2 From the Console on the Serial A/LOM Port” on page 59.

---

---

**Note** – If you have set up named users of the LOMlite2 device, the users need `c`-level permission to use the `console` command. Without it, the command will not work. For more information about setting up user permissions, see “Setting Up LOMlite2 Privileges for Named Users” on page 52.

---

## ▼ To Reset the Server

- To reset the server, type:

```
lom> reset
```

- To perform a limited reset affecting the processor only, type:

```
lom> reset -x
```

The `-x` option generates the equivalent of an externally initiated reset (XIR) of the server. You must have `r`-level permission to use this command. (For information about user authorization levels, see “Setting Up LOMlite2 Privileges for Named Users” on page 52.) The `-x` option takes the server into OpenBoot™ PROM mode and causes it to display the `ok` prompt. It is useful for driver or kernel debugging, because most of the contents of the server’s memory and registers are preserved. The server does not automatically return to the Solaris environment when you reset it using the `-x` option. Instead, you must reboot it from the `ok` prompt.

## ▼ To Display the `ok` or `kadb` Prompt

To display the `ok` or `kadb` prompt, type the following at the `lom>` prompt:

```
lom> break
```

---

**Note** – If the Serial A/LOM port is dedicated to the LOMlite2 device, this command will have no effect. For information about dedicating the Serial A/LOM port to the LOMlite2 device, see “Separating LOMlite2 From the Console on the Serial A/LOM Port” on page 59. To use the `break` command, you must have `c`-level LOMlite2 user privileges. For more information, see “Setting Up LOMlite2 Privileges for Named Users” on page 52.

---

## Controlling the Server’s Booting Behavior

The LOMlite2 shell includes a `bootmode` command:

```
bootmode [-u][normal|forth|reset_nvram|diag|skip_diag]
```

This command enables you to dictate the behavior of the server after a reset. Its functionality is identical to that available on Sun keyboards with the L1 key combinations. (However, the `bootmode` command is provided because the L1 key combinations are not available for the Netra X1 server: you cannot use them from a keyboard that is connected to the server with a serial link.)

You must have r-level LOMlite2 permission to use the `bootmode` command. For information about user privileges, see “Setting Up LOMlite2 Privileges for Named Users” on page 52.

## Boot Modes Available

If you use the `bootmode` command without arguments, the LOMlite2 device reports only the current boot mode. The boot modes available are listed in TABLE 5-1.

**TABLE 5-1** Boot Modes

Mode	Description
<code>-u</code>	This option does not represent a boot mode. However, if you have previously dedicated the Serial A/LOM port to LOMlite2 and you now want to share the port between the console and LOMlite2, you can use the <code>-u</code> option. It is a quick alternative to the procedure described for sharing the Serial A/LOM port in the section “Separating LOMlite2 From the Console on the Serial A/LOM Port” on page 59.
<code>normal</code>	In this mode, the server boots using your OpenBoot PROM settings. To cause this parameter to take effect, you must reset the server after using the <code>bootmode</code> command at the <code>lom&gt;</code> prompt.
<code>forth</code>	In this mode, the server does not boot to the Solaris environment but stops the boot cycle at the <code>ok</code> prompt. The command is equivalent to the L1-F key combination for Sun keyboards. To cause the parameter to take effect, you must use the <code>bootmode forth</code> command at the <code>lom&gt;</code> prompt and then reset the server. (It is only when the server resets that it reads the new <code>forth</code> parameter from the LOMlite2 device.)



**TABLE 5-1** Boot Modes

Mode	Description
<code>reset_nvram</code>	In this mode, the server returns all NVRAM data to its default setting. The command is equivalent to the L1-N key combination for Sun keyboards. To cause the parameter to take effect, you must reset the server after using the <code>bootmode</code> command at the <code>lom&gt;</code> prompt.
<code>diag</code>	In this mode, the server performs full self-diagnostics as part of the boot process. The command is equivalent to the L1-D key combination for Sun keyboards. To cause the parameter to take effect, you must power off and then power on the server within 10 minutes of using the <code>bootmode</code> command at the <code>lom&gt;</code> prompt.
<code>skip_diag</code>	In this mode, the server skips the diagnostics part of the boot process. To cause the parameter to take effect, you must power off and then power on the server within 10 minutes of using the <code>bootmode</code> command at the <code>lom&gt;</code> prompt.

---

## Monitoring the Server From the LOMlite2 Shell

This section describes commands that enable you to check the status of the server and the components monitored by the LOMlite2 device.

It also describes how to view the events stored in the LOMlite2 device's event log.

## ▼ To Check How Long the Server Has Been Running

- To find out how much time has elapsed since the last boot, type:

```
lom> date
Time since last boot: +8d+20h48m2s
```

or:

```
lom> showdate
Time since last boot: +8d+21h49m6s
```

## ▼ To Check the Current Status of All Components

- To see the current status of all the components monitored by the LOMlite2 device, type:

```
lom> environment
```

CODE EXAMPLE 5-1 shows sample output from the `environment` command. In this example, all the components are running normally and none are faulty.

**CODE EXAMPLE 5-1** Sample Output From the `environment` Command

```
lom>environment
Fault OFF
Alarm 1 OFF
Alarm 2 OFF
Alarm 3 OFF

Fans:
1 OK speed 99%
2 OK speed 95%

PSUs:
1 OK

Temperature sensors:
1 28degC OK
```

```
Overheat sensors:
```

```
1 OK
```

```
Supply rails:
```

```
1 OK
```

```
2 OK
```

```
3 OK
```

```
4 OK
```

```
5 OK
```

```
lom>
```

## Viewing the LOMlite2 Event Log

The `eventlog` command reports the last 10 events. The `loghistory` command can report up to several hundred events. Note that the first event is the oldest and that each event has a time stamp indicating the hours and minutes (and, if applicable, days) since the following:

- The LOMlite2 device was last powered off (that is, since all power to the server, including standby power, was last removed) or
- If the server has been booted since all power was last removed, then the time stamp indicates the number of days, hours, and minutes since the last reboot.

### ▼ To View the Last 10 Events in the Event Log

- **Type:**

```
lom> show eventlog
```

## ▼ To View the Entire Event Log

- Type:

```
lom> loghistory [pause x] [level y]
```

where  $x$  is the number of lines you want to display before pausing, and  $y$  is the severity level of the events you want to see. By default, the `loghistory` command displays all the events in the log and does not pause the display.

If you specify a severity level, you will see reports for the level you specify and above. For example, if you specify level 2, you will see reports of level 2 and level 1 events. If you specify level 3, you will see reports of level 3, level 2, and level 1 events.

If you do not specify a level, you will see events for all levels.

For more information about severity levels, see “Viewing Event Reports That LOMlite2 Sends to `syslogd`” on page 60.

Each entry in the log includes the time of the event, the server’s host name, a unique identifier for the event, and a user-friendly text message describing the event.

---

**Note** – The LOMlite2 device’s Event Log is never cleared, and it can contain several hundred entries. Events are stored from the very first time the server boots. Eventually the buffer might become full, but when this happens, the LOMlite2 device will start again at the beginning of the buffer, overwriting the earliest events.

---

## ▼ To View All Events From the First to the $n$ th Event Logged

- Type:

```
lom> loghistory index +n [pause x] [level y]
```

where  $n$  is the number of events you want to see that have been logged since the first event in the current log,  $x$  is the number of lines you want to display before pausing, and  $y$  is the severity level of the events you want to see. By default, the `loghistory` command does not pause the display.

## ▼ To View All Events From the Last One Logged to the *n*th Event Before It

- Type:

```
lom> loghistory index -n [pause x] [level y]
```

where *n* is the number of events you want to see listed that were logged before the last event in the current log, *x* is the number of lines you want to display before pausing, and *y* is the severity level of the events you want to see. By default, the `loghistory` command does not pause the display.

- To see the last five events, type:

```
lom> loghistory index -5
+0h39m34s Alarm 1 ON
+0h39m40s Alarm 3 ON
+0h39m54s Alarm 3 OFF
+0h40m0s Alarm 1 OFF
+0h40m58s Fault LED ON
```

## Verifying That a Component Has Been Fixed

If a monitored component has failed, the LOMlite2 device does not continue to report the failure. You can, however, check the status of a component, for example, after attempting to fix it.

## ▼ To Check the Status of a Component

- Type:

```
lom> check
```

This causes the LOMlite2 device to update the status of all the components it monitors.

---

# Setting Up LOMlite2 Privileges for Named Users

You can specify up to four named users of the LOMlite2 device on a Netra X1 server. By default, no users are set up, and therefore no user login prompt appears when you use the LOM escape sequence.

However, if you set up one or more users, every time you use the LOM escape sequence to display the `lom>` prompt, you will be prompted for a user name and password. Therefore, one of the user accounts you set up must be for yourself.

## Permissions Available for LOMlite2 Users

Four areas of authorization are available for named users. When you create a new user, no permissions are assigned until you use the `userperm` command. If you specify any permissions (using the `lom> userperm` command), only those that you specify will be available.

The four areas of authorization available are:

- **Console permission (c-level)**  
This enables the named user to select the system console from the `lom>` prompt (if the Serial A/LOM port is shared between the LOMlite2 and the console). The `break` command also requires console permission.
- **User Administration permission (u-level)**  
This enables the named user to add and delete users and alter their permissions.
- **Administration permission (a-level)**  
This enables the named user to change the LOMlite2 device's configuration variables (see "Introduction to Lights-Out Management" on page 41).
- **Reset permission (r-level)**  
This enables the user you have named to reset the server and to power it on and off using the LOMlite2 device.

For information about how to specify one or more of these areas of authorization for a named user, see "To Specify Permissions for a Named User" on page 55.

## ▼ To Create a LOMlite2 User Account

- **Type:**

```
lom> useradd username
```

where the *username* is up to eight characters long, begins with an alphabetic character, and contains at least one lowercase alphabetic character. You can use any of the following characters in the user name:

- Alphanumeric
- Period (.)
- Underscore (\_)
- Hyphen (-)

---

**Note** – You must have User Administration (u-level) authorization to add a user (see “Permissions Available for LOMlite2 Users” on page 52). If you have not added any users, you have a-level and all other levels of authorization by default.

---

## ▼ To Specify the Password for a LOMlite2 User Account

- **Type:**

```
lom> userpassword username
```

where the *username* is the name of a LOMlite2 user account that already exists.

---

**Note** – You must have User Administration (u-level) authorization to set a password for a user (see “Permissions Available for LOMlite2 Users” on page 52).

---

## ▼ To View the Details of a LOMlite2 User Account

- Type:

```
lom> usershow
```

This command displays the details of all users.

---

**Note** – You must have User Administration (u-level) authorization to view the details of a LOMlite2 user account (see “Permissions Available for LOMlite2 Users” on page 52).

---

## ▼ To Change Your Own User Password

1. To change the password for the account you are currently logged into, type:

```
lom> password
```

2. When prompted, specify the current password.
3. When prompted, specify the new password you want to use.
4. Specify the new password again to confirm it.

## ▼ To Delete a LOMlite2 User Account

- Type:

```
lom> userdel username
```

where the *username* is the name of an existing LOMlite2 user account.

---

**Note** – You must have User Administration (a-level) authorization to delete a user account (see “Permissions Available for LOMlite2 Users” on page 52).

---

If you delete all the users you have set up, you will no longer see the login prompt when you go to the lom> prompt.



By default, all four areas of authorization are available to each named user you set up. You can limit users to a particular area or areas of authorization by specifying permissions for a named user.

## ▼ To Specify Permissions for a Named User

- **Type:**

```
lom> userperm username [c][u][a][r][-]
```

You can specify:

- **All four parameters** (for example, `userperm cuar`)  
This also makes all four areas available to the named user.
- **One, two, or three parameters**  
This makes only the parameter or parameters you specify available.

The parameters are:

- **c**  
This stands for “console permission”. It enables the named user to exit from the `lom>` prompt to the Solaris prompt (as long as the Serial A/LOM port is shared between LOMlite2 and the console).
- **u**  
This stands for “user administration permission”. It enables the named user to add and delete users and alter their areas of authorization by using the `userperm` command.
- **a**  
This stands for “administration permission”. It enables the named user to change the LOMlite2 device’s configuration variables (see “Setting the LOMlite2 Device’s Configurable Variables” on page 56).
- **r**  
This stands for “reset permission”. It enables the user you have named to reset the server and to power it on and off using the LOMlite2 device.
- **-**  
Use this character to specify that no permissions are assigned.

## ▼ To Quit a LOMlite2 Named User Session

- **Type:**

```
lom> logout
```

This returns you to the LOMlite2 login prompt.

---

## Setting the LOMlite2 Device's Configurable Variables

---

**Note** – To be able to run the commands described in this section, a named user must have a-level permission. For more information, see “Setting Up LOMlite2 Privileges for Named Users” on page 52.

---

## ▼ To Turn the Fault LED On and Off

- **To turn the Fault LED on by setting the `faulton` variable, type:**

```
lom> faulton
```

- **To turn the Fault LED off by setting the `faultoff` variable, type:**

```
lom> faultoff
```

## ▼ To Set an Alarm Flag

- Turn the alarm on by typing:

```
lom> alarmon n
```

where *n* is the number of the alarm you want to turn on: 1, 2, or 3.

- Turn the alarm off by typing:

```
lom> alarmoff n
```

where *n* is the number of the alarm you want to turn off: 1, 2, or 3.

Alarms 1, 2, and 3 are software flags. They are not associated with any specific conditions, but are available to be set by your own processes or from the command line. For more information, see “To Turn the Alarms On and Off (lom -A)” on page 75.

## ▼ To Stop LOMlite2 Sending Event Reports to the Serial A/LOM Port

- Enable event reporting by typing:

```
lom> event-reporting on
```

---

**Note** – This is the equivalent of using the `lom -E on` command from the Solaris shell. For more information, see “To View the Event Log (lom -e)” on page 70.

---

- Disable event reporting by typing:

```
lom> event-reporting off
```

---

**Note** – This is the equivalent of using the `lom -E off` command from the Solaris shell. For more details, see “To Stop LOMlite2 From Sending Reports to the Serial A/LOM Port (lom -E off)” on page 76.

---



---

# Separating LOMlite2 From the Console on the Serial A/LOM Port

By default, the LOMlite2 device shares the Serial A/LOM port with the console, and when it has an event report to send, it takes control of the Serial A/LOM port itself, interrupting any console activity you are performing. To prevent the LOMlite2 device from interrupting the console, either turn serial event reporting off (see Chapter 6), or dedicate the Serial A/LOM port to the LOMlite2 device and use the Serial B port for console activity. The next section, “To Dedicate Serial A/LOM to LOMlite2” on page 59, gives more detail.

The advantages of dedicating the Serial A/LOM port to the LOMlite2 device and using Serial B as your console port include:

- Preserving the ability to power on or reset the server (from the `lom>` prompt on Serial A/LOM) even if for any reason you lose access to Solaris on your console port (Serial B).
- Capturing all LOMlite2 events passively on a terminal connected to the dedicated LOM port (Serial A/LOM). Note, however, that if you dedicate the Serial A/LOM port to the LOMlite2 device, you cannot use the `console` command to quit the LOMlite2 shell. Instead, for access to the Solaris environment, you must connect to the server using the Serial B port.
- Preventing a user with console access from using the LOMlite2 escape sequence to exit the Solaris environment and access the LOMlite2 shell. If you dedicate the Serial B port to the console, users cannot bring up the LOMlite2 shell, which means that they cannot interrogate or reconfigure the LOMlite2 device.
- Performing binary data transfers. To perform any task other than an ASCII transfer, you must use the Serial B port.

## ▼ To Dedicate Serial A/LOM to LOMlite2

1. Set up console connections to both the Serial A/LOM port and the Serial B port.
2. At the Solaris prompt, type:

```
# eeprom input-device=ttyb
# eeprom output-device=ttyb
# reboot
```

The Serial B port (ttyb) is now your console port. The Serial A/LOM port remains in the control of the LOMlite2 device.

## ▼ Sharing Serial A/LOM Between LOMlite2 and the Console

---

**Note** – By default, the Serial A/LOM port is shared by the LOMlite2 device and the console. Therefore, you should follow the instructions in this section only if you have configured the server by using the instructions in the previous section (“To Dedicate Serial A/LOM to LOMlite2” on page 59) and you now want to share the Serial A/LOM port between LOMlite2 and the console.

---

1. Set up console connections to both the Serial A/LOM port and the Serial B port.
2. At the Solaris prompt, type:

```
# eeprom input-device=ttya
# eeprom output-device=ttya
# reboot
```

The Serial A/LOM port (ttya) is now shared between the LOMlite2 device and the console.

---

## Viewing Event Reports That LOMlite2 Sends to syslogd

The LOMlite2 device monitors the status of the fans, supply rails, temperature, and power supply even when the server is powered off (the LOMlite2 device operates on standby power). If it detects a fault, it turns on the Fault LED on the server’s front and back panels and stores a report in an event log, which resides in memory on the LOMlite2 device. When the Solaris environment is running, the LOMlite2 device also sends event reports to `syslogd`. The `syslogd` handles these in the way it has been configured to handle event reports. This means that by default it sends them to the console and stores them in:

```
/var/adm/messages
```

In this file, the reports are displayed with a label identifying them as `lom` reports and indicating their severity. Starting with the most severe, the levels of severity are:

### 1. Fatal

Fatal events can cause the server to shut itself down. Examples of fatal events are:

- Supply rail failures.
- Exceeded temperature thresholds.

### 2. Warning

Warning events do not cause the server to shut down, but they do require immediate attention. Examples of warning events are:

- Fans turning too slowly.
- Fault LED has been turned on.
- System Configuration Card has been removed.

### 3. Info

Info events are most likely to inform you that a problem is now fixed. For example, if you reinsert the System Configuration Card, the LOMlite2 device will generate an event to say that the System Configuration Card has been restored.

### 4. User

User level events indicate the activity of named users whom you have authorized to access the LOMlite2 device. For example, an event is generated when a user logs in or out.

---

## LOMlite2 Shell Command List

The commands you can use from the `lom>` prompt are listed in TABLE 5-2.

**TABLE 5-2** LOM Commands

Command	Description
<code>alarmoff n</code>	Sets alarm <i>n</i> off, where <i>n</i> is 1, 2, or 3. These three alarms are software flags. They are associated with no specific conditions but are available to be set by your own processes.
<code>alarmon n</code>	Sets alarm <i>n</i> on. See the description for the <code>alarmoff</code> command.
<code>break</code>	Takes the server down to the <code>ok</code> prompt.
<code>bootmode</code>	Determines the behavior of the server during the boot process.

**TABLE 5-2** LOM Commands (*Continued*)

<b>Command</b>	<b>Description</b>
check	Resets monitoring to report all failures. If a monitored component has failed, the LOMlite2 device will not continue to report the same failure. To check the status of the component, for example, after attempting to fix it, use the <code>check</code> command. This updates the status of all monitored components.
console	Takes you out of the LOMlite2 shell and back to the Solaris prompt. It returns control of the serial connection to the console.
environment	Displays the temperature of the server and the status of the fans, the power supply, the overtemperature monitors, the supply rails and circuit breakers, the alarms, and the fault LED.
faulton	Sets the Fault LED to On.
faultoff	Sets the Fault LED to Off.
help	Displays the list of LOM commands.
loghistory	Displays all the events in the LOMlite2 device's Event Log.
logout	Returns named users you have set up with password access to the LOM user login prompt.
poweron	Powers the server on.
poweroff	Powers the server down to standby power mode.
reset	Resets the server.
show model	Displays the server model.
show hostname	Displays the server name (this command is equivalent to the Solaris <code>uname -n</code> command).
show eventlog	Displays the LOMlite2 device's event log. The event log is the list of the last 10 events stored in the LOMlite2 device. The most recent event is the one at the bottom of the list.
show escape	Displays the current LOMlite2 escape sequence.
show	Displays all the information available with the <code>show</code> command.
useradd	Adds a user to the LOMlite2 device's list of permitted users.
userdel	Deletes a user from the LOMlite2 device's list of permitted users.
usershow	Displays the details of a named user's LOMlite2 account.
userpassword	Sets or changes a user's password.
userperm	Sets the permission levels for a named user.
version	Displays the version number of the LOMlite2 device.



## Managing the Netra X1 Server From the Solaris Prompt

---

This chapter describes how to monitor and manage the Netra X1 server with LOMlite2-specific commands in the Solaris 8 operating environment. It contains the following sections:

- “Monitoring the System From the Solaris Prompt” on page 64
- “Configuring Automatic Server Restart (ASR)” on page 71
- “Other LOM Tasks You Can Perform From the Solaris Prompt” on page 75

---

**Note** – For information about how to configure the LOMlite2 device driver, see Appendix A.

---

---

# Monitoring the System From the Solaris Prompt

To use the Lights-Out Management (LOM) facilities either remotely or locally, you need a terminal connection to the Serial A/LOM port on the server (see “Setting Up a Console Connection to the Server” on page 16).

There are two ways to interrogate LOMlite2 or to send it commands to perform:

- Use LOMlite2 commands from the `lom>` shell prompt. For information about how to do this, see Chapter 5.
- Use LOMlite2-specific Solaris commands from the Solaris prompt. These commands are described in this chapter.

All Solaris commands described in this section are available from the main Solaris `#` prompt. They run a utility called `/usr/sbin/lom`.

Where appropriate, the command lines given in this section are accompanied by typical output from the commands.

There are also manual pages for the LOMlite2 utility.

## ▼ To View the LOMlite2 Online Documentation

- To view the manual pages for the LOMlite2 utility, type:

```
# man lom
```

## ▼ To Check the Power Supply Unit (`lom -p`)

- To check whether the input lines and the output line for the power supply unit are working normally, type:

```
# lom -p
PSU:
1 OK
#
```

## ▼ To Check the Fan Status (`lom -f`)

- Type:

```
# lom -f
Fans:
1 OK speed 99%

#
```

## Checking the Supply Rail Voltages and Internal Circuit Breakers (`lom -v`)

The supply rails are the Netra X1 server's internal power lines. If the status of any of these is `faulty`, contact your local Sun sales representative. It means that you have either a faulty system board or a faulty PSU.

The `-v` option also displays the status of the server's internal circuit breakers. For any that have been tripped, the status will read `faulty`. The system contains three circuit breakers: one for each of the USB ports and one for the system configuration card reader.

If there is a problem with the circuit breakers or the USB port circuit breakers, remove the device connected to the relevant port and the circuit breakers will automatically recover.

If there is a problem with the circuit breaker for the system configuration card, it means either that the system configuration card is inserted incorrectly, or is broken. Insert a valid one to check.

## ▼ To Check the Status of the Supply Rails and Internal Circuit Breakers

- Type:

```
# lom -v
Supply voltages:
 1 5V status=ok
 2 3V3 status=ok
 3 +12V status=ok
 4 -12V status=ok
 5 VDD-CORE status=ok

System status flags (circuit breakers):
 1 USB0 status=ok
 2 USB1 status=ok
```

## ▼ To Check the Internal Temperature

- Type:

```
# lom -t
System Temperature Sensors:
 1 enclosure 25 degC : warning 67 degC : shutdown 72 degC

System Over-temperature Sensors:
 1 cpu status=ok
#
```

This checks the server's internal temperature, and the warning and shutdown threshold temperatures.

## ▼ To Check Whether the Fault LED and Alarms Are On or Off

- **Type:**

```
# lom -l
LOMlite alarm states:
Alarm1=off
Alarm2=off
Alarm3=off
Fault LED=on
#
```

Alarms 1, 2, and 3 are software flags. They are not associated with any specific conditions, but are available to be set by your own processes or from the command line. For more information, see “To Turn the Alarms On and Off (lom -A)” on page 75.

## ▼ To Change the LOMlite2 Automatic Server Restart Configuration (lom -w)

For full information about enabling and using LOMlite2’s Automatic Server Restart (ASR) process, see “To Configure the LOMlite2 ASR” on page 72.

- **To find out how the LOMlite2 watchdog is currently configured, type:**

```
# lom -w
LOMlite watchdog (ASR) settings:
Watchdog=on
Hardware reset=off
Timeout=40 s
#
```

The LOMlite2 watchdog is enabled by default when the Solaris environment boots. This means that, by default, if the watchdog does not receive a “pat” for 40,000 milliseconds, it will turn on the Fault LED on the front and back panels of the system, generate a LOM event report, and, if configured to do so, perform an automatic server restart. However, although the watchdog is enabled by default when Solaris boots, the `Hardware reset` option is not. This means that the LOMlite2 device does not, by default, automatically restart the server after a lockup.

- To configure the LOMlite2 device to perform an automatic server restart (ASR) after a lockup, you must enable the `Hardware reset` option as well as the `Watchdog` option.

For more information, see “Configuring Automatic Server Restart (ASR)” on page 71.

## ▼ To View the Configuration of LOMlite2

- To view the settings of all the configurable variables for the LOMlite2 device, type:

```
# lom -c
LOMlite configuration settings:
serial escape character=#
serial event reporting=default
Event reporting level=fatal, warning & information
Serial security=enabled
Disable watchdog on break=disabled
Automatic return to console=disabled
alarm3 mode=watchdog
firmware version=3.0
firmware checksum=2983
product revision=0.0
product ID=Netra X1 200
#
```

## ▼ To View All the Status Data Stored by LOMlite2, Plus Details of the Device's Own Configuration

- Type:

```
# lom -a
```

The code example below gives sample output of this command:

### CODE EXAMPLE 6-1 Sample lom -a output

```
PSUs:
1 OK

Fans:
1 OK speed 68%

LOMlite configuration settings:
serial escape character=#
serial event reporting=default
Event reporting level=fatal, warning & information
Serial security=enabled
Disable watchdog on break=enabled
Automatic return to console=disabled
alarm3 mode=user controlled
firmware version=3.9
firmware checksum=2262
product revision=0.1
product ID=Netra X1

LOMlite Event Log:
+12d+18h28m30s  fault led state - ON
+12d+18h28m34s  fault led state - OFF
+12d+18h28m43s  fault led state - ON
+12d+18h28m45s  fault led state - OFF
+12d+18h28m46s  fault led state - ON
+12d+18h28m47s  fault led state - OFF
+12d+18h28m48s  fault led state - ON
+12d+18h28m49s  fault led state - OFF
4/11/2001 15:23:33 GMT LOM time reference
4/25/2001 15:30:13 GMT LOM time reference
```

**CODE EXAMPLE 6-1** Sample `lom -a` output

```
PSUs:
LOMlite alarm states:
Alarm1=off
Alarm2=off
Alarm3=on
Fault LED=off

LOMlite watchdog (ASR) settings:
Watchdog=off
Hardware reset=off
Timeout=127 s

Supply voltages:
1          5V status=ok
2          3V3 status=ok
3          +12V status=ok
4          -12V status=ok
5          VDD core status=ok

System status flags (circuit breakers):
1          USB0 status=ok
2          USB1 status=ok
3          SCC status=ok

System Temperature Sensors:
1          Enclosure 27 degC : warning 67 degC : shutdown 72 degC
System Over-temperature Sensors:
1 CPU status=ok

Console output prior to last reset:
```

## ▼ To View the Event Log (`lom -e`)

- To see the event log, type:

```
# lom -e n,[x]
```

where *n* is the number of reports (up to 128) that you want to see and *x* specifies the level of reporting you require. There are four levels of event reporting:



1. Fatal events
2. Warning events
3. Information events
4. User events

If you specify a level, you will see reports for that level and above. For example, if you specify level 2, you will see reports of level 2 and level 1 events. If you specify level 3, you will see reports of level 3, level 2, and level 1 events.

If you do not specify a level, you will see reports of level 3, level 2, and level 1 events.

FIGURE 6-1 shows a sample event log display. Note that the first event is the oldest and that each event has a date stamp indicating the days, hours and minutes since the system was last booted.

```
# lom -e 10
LOMlite Event Log:
+0h0m21s host reset
9/15/2000 17:35:28 GMT LOM time reference
+0h3m20s fault led state - ON
+0h3m24s fault led state - OFF
+0h39m34s Alarm 1 ON
+0h39m40s Alarm 3 ON
+0h39m54s Alarm 3 OFF
+0h40m0s Alarm 1 OFF
+0h48m52s fault led state - OFF
+0h49m39s Fan 1 FATAL FAULT: failed
+0h50m58s fault led state - ON

# lom -e 10
```

**FIGURE 6-1** Sample LOMlite2 Device Event Log (Oldest Event Reported First)

---

## Configuring Automatic Server Restart (ASR)

You can configure LOMlite2 to restart the server automatically after a lockup. LOMlite2 has a watchdog process that, by default, expects to be patted every 10,000 milliseconds. If it does not receive a pat after 40,000 milliseconds (default), then

LOMlite2 turns the front and back fault LEDs on and generates a LOM event report. However, it does not automatically restart the system unless you have configured it to do so.

## ▼ To Configure the LOMlite2 ASR

- Add the `-R` option to the `priocntl` command in the script file called `/etc/rc2.d/S25lom`.

This is the script that runs the LOMlite2 watchdog process:

```
# priocntl -e -c RT lom -W on,40000,10000 -R on
```

When you have done this, LOMlite2 will restart the server whenever the watchdog times out.

You can turn the option on and off from the Solaris command prompt. For more information, see “To set the Hardware Reset Option From a Script or Command (`lom -R on`)” on page 73.

However, as long as you have the `-R on` option set in `/etc/rc2.d/S25lom`, the `Hardware Reset` option will always be enabled when you start the system.

## Enabling the LOMlite2 Watchdog Process From Your Own Script or Command (`lom -W on`)

---

**Note** – You do not normally need to do this. If you want to configure LOMlite2 to perform an automatic server restart after a lockup, see “To Configure the LOMlite2 ASR” on page 72. Use the `lom -W on` option on the command line or in another script file only if you have removed the `/etc/rc2.d/S25lom` script.

---

By default, the LOMlite2 watchdog process is enabled, and if you type `lom -W on` while the watchdog process is already running, the command will have no effect. You can run this command only if you have removed the `/etc/rc2.d/S25lom` script file, or if you have turned the watchdog off manually by using the `lom -W off` command.

The default `priocntl` command is:

```
priocntl -e -c RT lom -W on,40000,10000
```

The number 40,000 on this command line indicates the watchdog's timeout period in milliseconds; you can specify a different number. The number 10,000 indicates its pat interval in milliseconds; again, you can specify a different number.

---

**Note** – Do not specify a watchdog timeout period of less than 5000 milliseconds. If you do, the watchdog times out frequently even though the server has not locked up.

---

If the watchdog process times out (in other words, if it does not receive its expected pat), the LOMlite2 device will turn on the server's front and back Fault LEDs and generate a LOM event report. However, it will not automatically reset the system. To make it reset the system, you must use the `-R on` option. For more information, see "To set the Hardware Reset Option From a Script or Command (`lom -R on`)" on page 73.

- If you have no LOMlite2 watchdog process running already and you want the process to run, type the following, or add it to another script file:

```
# lom -W on,40000,10000
```

- If you want the LOMlite2 device to perform an automatic server restart after a lockup, you must include the `-R on` option in the command, as follows:

```
# lom -W on,40000,10000 -R on
```

---

**Note** – Unless you include the `lom -W on` and `-R on` options in a script file, you must run the `lom` command every time you reboot the system if you want to use the automatic server restart facility. Otherwise the watchdog will not run, and the server will not reset after a lockup.

---

## ▼ To set the Hardware Reset Option From a Script or Command (`lom -R on`)

To make the LOMlite2 device's watchdog process trigger an automatic server restart (ASR) after a lockup, add the `-R on` option to the command in your `/etc/rc2.d/S25lom` script file. This is the script that runs the watchdog. For instructions about how to do this, see "To Configure the LOMlite2 ASR" on page 72.

However, if for any reason you are not using the script file provided with your system (`/etc/rc2.d/S25lom`) but have instead enabled the watchdog from the command line or from another script file, you can turn the `Hardware reset` option on.

- **To turn the `Hardware reset` option on, type the following at the command line:**

```
# lom -R on
```

- **To turn the `Hardware reset` option off from the command line, type:**

```
# lom -R off
```

---

# Other LOM Tasks You Can Perform From the Solaris Prompt

This section describes how to:

- Turn the alarms and Fault LEDs on and off with the `lom` command.
- Change the first character of the `lom` escape sequence.
- Stop LOMlite2 sending reports to the Serial A/LOM port.
- Remove driver protection from the device driver.
- Make the LOMlite2 interface backward compatible.
- Upgrade LOMlite2 firmware.

## ▼ To Turn the Alarms On and Off (`lom -A`)

There are three alarms associated with LOMlite2. They are not associated with specific conditions but are software flags that can be set either by your own processes or from the command line.

- To turn an alarm on from the command line, type:

```
# lom -A on,n
```

where *n* is the number of the alarm you want to set: 1, 2, or 3.

- To turn the alarm off from the command line, type:

```
# lom -A off,n
```

where *n* is the number of the alarm you want to turn off: 1, 2, or 3.

## ▼ To Turn the Fault LED On and Off (`lom -F`)

- To turn the Fault LED on, type:

```
# lom -F on
```

- To turn the Fault LED off, type:

```
# lom -F off
```

## ▼ To Change the First Character of the Sequence for Escaping to the lom> Prompt (lom -X)

The character sequence #. (hash, dot) enables you to exit the Solaris prompt to the lom> prompt.

- To change the first character of this default lom escape sequence, type:

```
# lom -X x
```

where *x* is the alphanumeric character you want to use instead of #.

---

**Note** – If you are at the console and you type the first character of the LOM escape sequence (by default this is #), there is a delay of one second before the character appears on the screen. This is because the system waits to see if you type the dot (.) character next. If you do, the lom> prompt appears. If you do not, the # character appears. If you want to change the LOM escape character, use a character that is not included in any console commands; otherwise the delay between your striking the key and the character appearing on the screen may affect your typing at the console.

---

## ▼ To Stop LOMlite2 From Sending Reports to the Serial A/LOM Port (lom -E off)

LOMlite2 event reports can interfere with information you are attempting to send or receive on the Serial A/LOM port. By default, the Serial A/LOM port is shared by the console and LOMlite2. LOMlite2 interrupts the console whenever it needs to send an event report. To prevent LOMlite2 from interrupting the console on Serial A/LOM, turn serial event reporting off.

- To stop LOMlite2 from sending reports to the Serial A/LOM port, type:

```
# lom -E off
```

- **To turn serial event reporting on again, type:**

```
# lom -E on
```

If you want to dedicate the Serial A/LOM port to the LOMlite2 device and you want to use the Serial B port as your console port, see “To Dedicate Serial A/LOM to LOMlite2” on page 59.

## ▼ **To Remove Driver Protection From the LOMlite2 Driver (lom -U)**

By default, the LOMlite2 driver cannot be unloaded. This is because the driver is required by the watchdog process. If you unload the driver and you have configured the system to restart when the watchdog times out, the watchdog will time out, causing a system reset. For information about configuring the system to restart automatically after a lockup, see “Configuring Automatic Server Restart (ASR)” on page 71.

To remove driver protection from the LOMlite2 driver so that you can unload the driver:

1. **Turn the watchdog process off by typing:**

```
# lom -W off
```

2. **Unload the driver by typing:**

```
# lom -U
```

## ▼ To Make the LOMlite2 Interface Backward Compatible (lom -B)

If you have scripts written to the LOMlite interface on the Netra T1 Model 100/105 server or the Netra t 1400/1405 server and you want to use these scripts on the Netra X1 server, you can add file system links that make this possible. To do so, type:

```
# lom -B
```

When you have done this, you will be able to use the old scripts on the new system.

## ▼ To Upgrade LOMlite2 Firmware (lom -G default)

To upgrade the firmware for LOMlite2, obtain the new firmware package from the SunSolve<sup>SM</sup> website (<http://sunsolve.sun.com>) or from your local Sun sales representative, and type the following:

```
# lom -G default
```

---

**Note** – LOMlite2 firmware upgrades will be released as patches and will include detailed installation instructions.

---



PART **III** Maintenance and Troubleshooting

---



## Interpreting the LEDs

---

This chapter describes the location, function, and meaning of the Netra X1 server's warning LEDs, and contains the following sections:

- "Interpreting the Front- and Back-Panel LEDs" on page 82

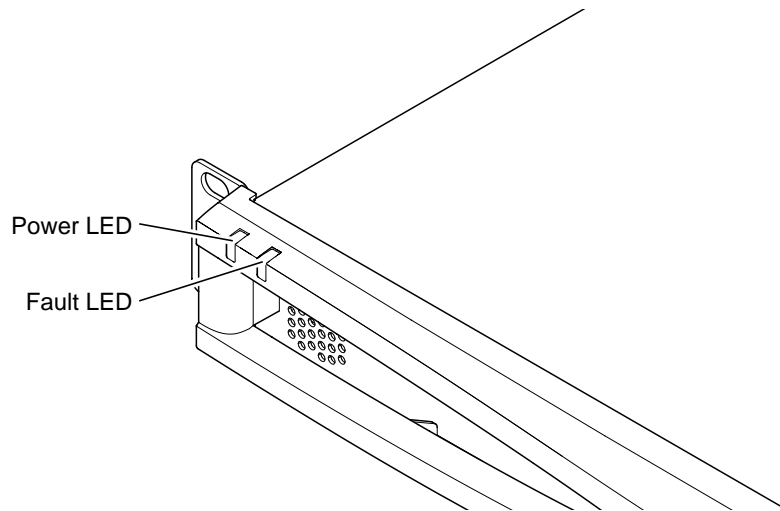
---

# Interpreting the Front- and Back-Panel LEDs

The Netra X1 server contains two front panel LEDs (see FIGURE 7-1) and four rear panel LEDs (see FIGURE 7-2). Those on the front panel indicate power and faults only. Those on the back panel indicate the presence of up to two ethernet connections, and replicate the power and fault information of the front LEDs.

## Front-Panel LEDs

The front panel LEDs are located at the top left of the server's front bezel.



**FIGURE 7-1** Front-Panel Power and Fault LEDs

- **Power LED (Green)**  
This LED is lit when the server is powered on. It is unlit when the server is in standby mode.
- **Fault LED (Amber)**  
The Fault LED is *constantly* on when a problem has occurred that is *not fatal* to the server but that you should attend to as soon as possible. Circumstances that could cause this include the following:

- The temperature inside the server's enclosure is higher than normal.
- The voltage on one of the server's output supply rails is unusually high.
- The system configuration card, containing the server's serial number, MAC address, and NVRAM settings, has been removed.
- The LOMlite2 watchdog has timed out, indicating that the server has locked up. You can configure the server to restart automatically after a lockup (see Chapter 6).

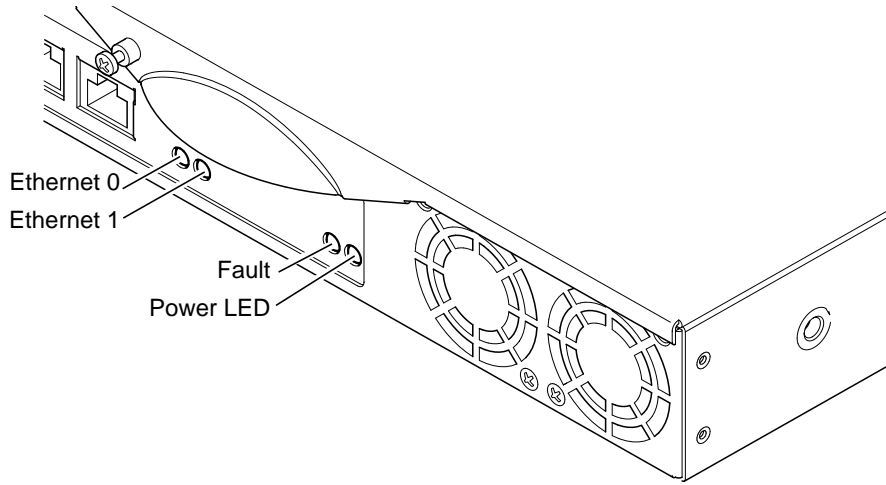
The Fault LED *flashes* when a problem has occurred *that is fatal* to the server. Circumstances that cause the Fault LED to flash include the following:

- The speed of the fan inside the server is too low.
- The temperature inside the server's enclosure is too high. By default, this causes the server to shut down. For information about configuring the server not to shut down in this condition, see Appendix B.
- The voltage on one of the server's output supply rails is too high. By default, this causes the server to shut down. For information about configuring the server not to shut down in this condition, see Appendix B.
- The temperature inside the CPU is too high. This causes the server to shut down.

## Back-Panel LEDs

The Netra X1 server contains four back panel LEDs (see FIGURE 7-2):

- **Ethernet port 0**  
Lights to indicate link status with dmfe0.
- **Ethernet port 1**  
Lights to indicate link status with dmfe1.
- **Fault LED**  
This mirrors the Fault LED on the front panel.
- **Power LED**  
This mirrors the Power LED on the front panel.



**FIGURE 7-2** Back-Panel Power and Fault LEDs

## ▼ To Turn the Fault LED On or Off

- To turn the Fault LED on, type:

```
# lom -F on
```

- To turn the Fault LED off, type:

```
# lom -F off
```

For information about turning the Fault LEDs on and off from the LOMlite2 shell, see Chapter 5.

For more information about the `lom` commands included in the Solaris operating environment, see Chapter 6.

## Removing and Replacing Components

---

This chapter details the procedures for moving the system configuration card from one server to another, and for changing replaceable components. It contains the following sections:

- “Adding Components or Replacing A Server” on page 86
- “Replacing the System Configuration Card” on page 86
- “Adding or Changing Internal Components” on page 87
- “Identifying Components” on page 91
- “Memory Installation and Removal” on page 92
- “Hard Disk Drive (HDD) Installation and Removal” on page 93

---

# Adding Components or Replacing A Server

For a list of components that are available for the Netra X1 server, see “Optional Components” on page 4. If there is a fault with any of the components listed below, replace the whole server. Should you need to do this, contact your Sun sales representative.

- Motherboard
- Processor
- Power Supply Unit
- Fan

The server contains a memory card called the system configuration card. The card contains the following data:

- the only copy of NVRAM
- IDPROM
  - host ID
  - MAC address

---

# Replacing the System Configuration Card

The card is removable so that you can transfer the host ID and configuration data onto a new server, allowing quick and easy server replacement.

## ▼ To Swap the System Configuration Card (SCC) Between Servers

1. Make sure that both Netra X1 servers are powered down.
2. Remove the zip ties securing the system configuration cards in both servers, and remove the cards.
3. Insert the system configuration card from the old server into the new one.
4. Replace the zip tie on the new system.



## 5. Power on the new system (see Chapter 4).



---

**Caution** – Never remove the system configuration card when the server is booting or running Solaris. Power the server off or down to standby mode before removing or inserting the system configuration card.

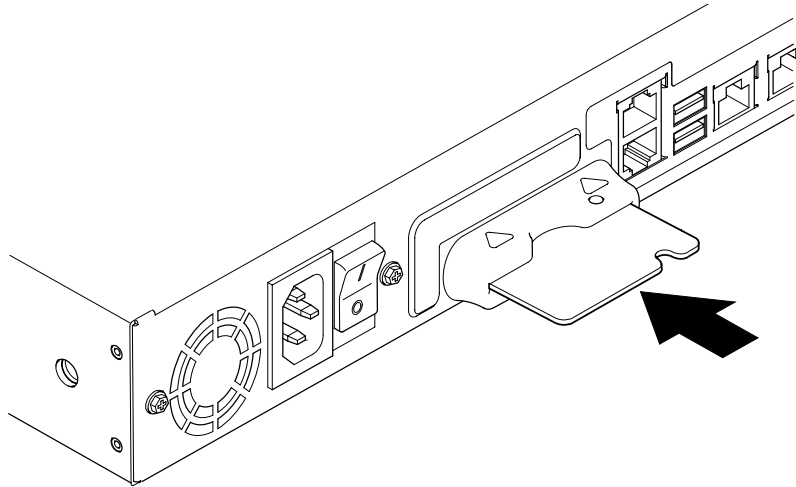
---



---

**Caution** – Do not handle the system configuration card unless you need to transfer it to another system. If you need to handle it for this reason, avoid contact with the gold terminals on the underside of the card.

---



**FIGURE 8-1** The System Configuration Card Slot

---

## Adding or Changing Internal Components

The procedures in this section are for the attention of qualified service engineers only. If you need to replace or add a component, contact your local Sun sales representative, who will put you in touch with the Sun Enterprise Service branch for

your area. You can then arrange to return the system to Sun for repair under the terms of your warranty or you can order the components and have them installed by your own qualified service engineers.



---

**Caution** – The system contains electronic parts that are extremely sensitive to static electricity. Do not touch any metal parts. Place the system on top of an electrostatic discharge (ESD) pad (see FIGURE 8-2). Use the disposable antistatic wrist strap supplied with the system, and attach it to the metal base of the system before touching any of the internal components.

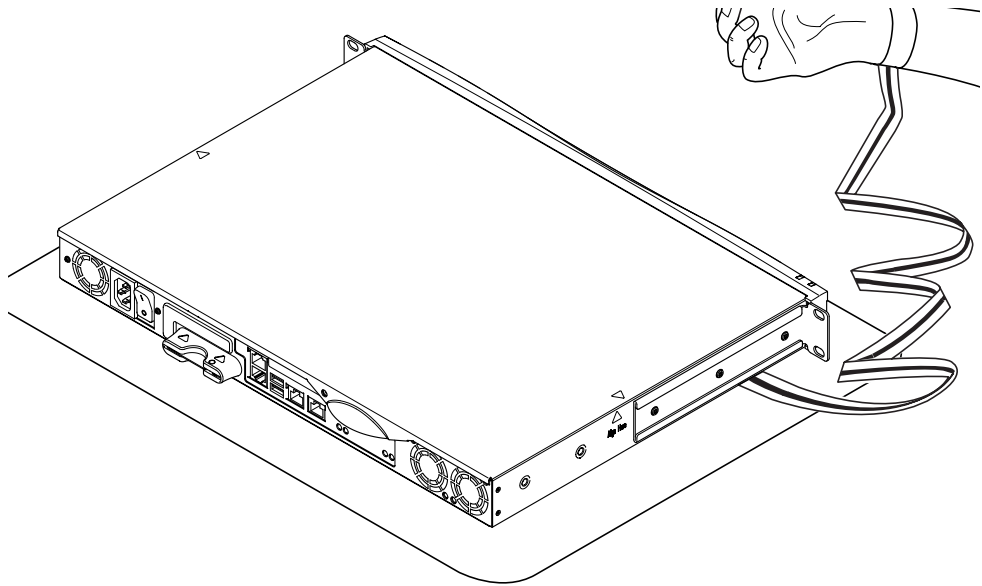
---



---

**Caution** – Before attempting to remove the cover, make sure that the server is powered off and that the power cord, and all other cables, have been disconnected from it.

---



**FIGURE 8-2** Using the Disposable Antistatic Wrist Strap Supplied With the System

## ▼ To Change Components In a Netra X1 Server That Is In Use

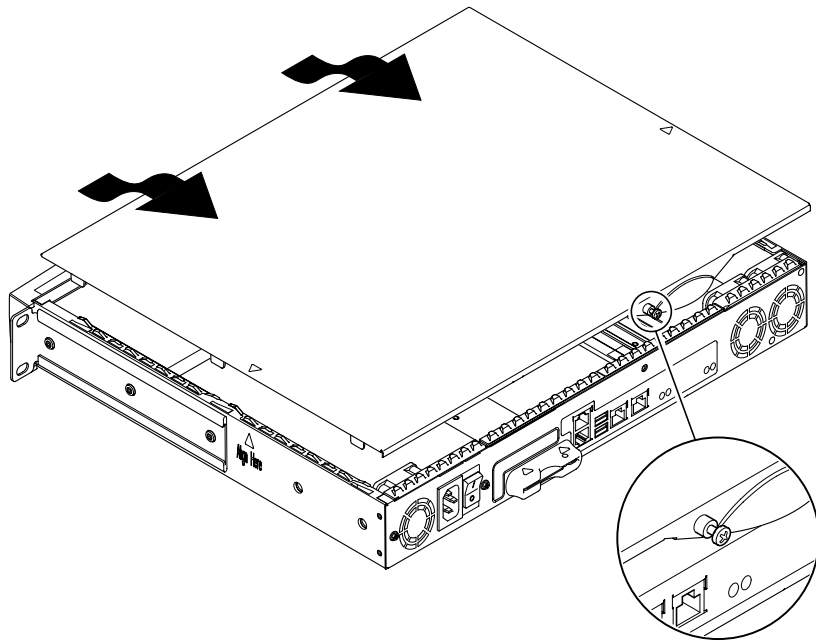
If the system is currently in use and you need to open it to install a component:

1. **Shut down the Solaris environment from the console.**

2. Hold the On/Standby switch in the Standby position for more than four seconds to put the server in standby mode.
3. Disconnect the power cord.
4. Disconnect all other cables.
5. If the system is installed in a rack or cabinet, remove it.

## ▼ To Remove the Top Cover

- If the Netra X1 server is not in use, go straight to step 1.
- If the server is already in use, see “To Change Components In a Netra X1 Server That Is In Use” on page 88.



**FIGURE 8-3** Removing the Top Cover

1. Place the unit on an ESD surface and attach an antistatic wrist strap (see FIGURE 8-2).
2. Unscrew the captive screw from the back of the unit (see FIGURE 8-3).

3. Slide the top cover back until the arrow on the cover lines up with the arrow on the server body.
4. Lift the cover up and off.

## ▼ To Replace the Top Cover

1. Align the arrow on the cover with the arrow on the server body.
2. Press the cover down so that it clips into the server body.

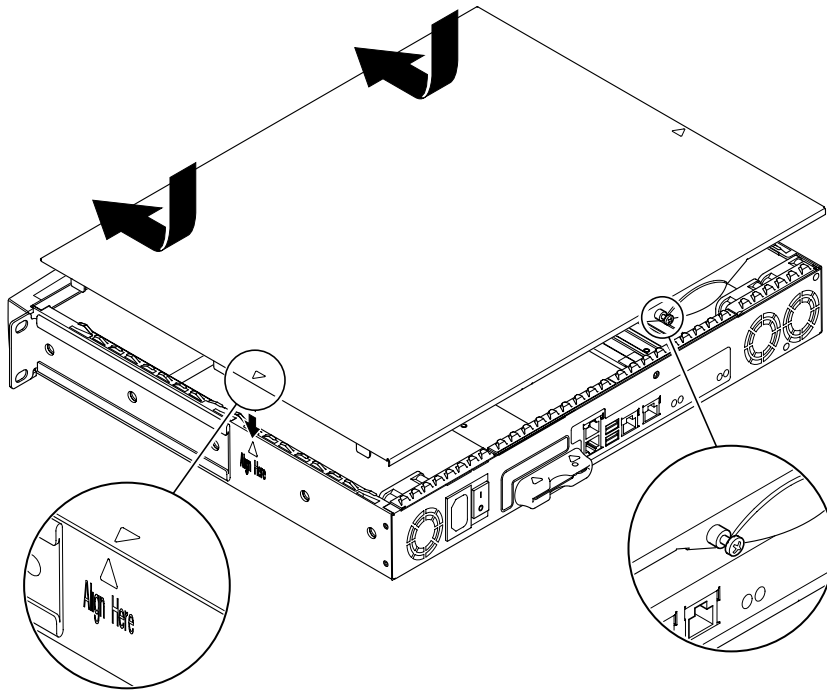


FIGURE 8-4 Replacing the Top Cover

3. Slide the cover forwards so that its leading edge is flush with the back of the server's front bezel.

---

**Note** – When the cover is in position, the arrows do not line up; the arrow on the cover is further towards the bezel than the arrow on the server body.

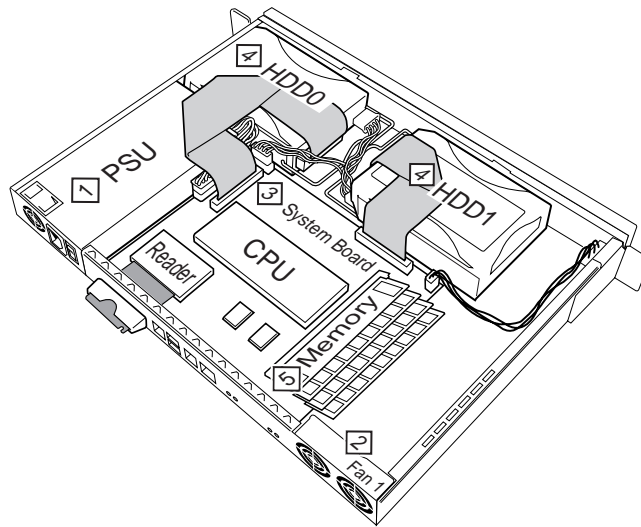
---

4. Tighten the captive screw on the back of the unit.

---

## Identifying Components

Viewed from the back with the cover removed, the internal components of the Netra X1 server are laid out as in FIGURE 8-5. This image, and a summary of the instructions given in this section, are repeated on the underside of the server's top cover.



**FIGURE 8-5** Layout of Components

The components shown are

1. Power Supply Unit
2. Fan
3. System Board
4. Hard Disk Drive (HDD) 0 and 1
5. Memory

---

# Memory Installation and Removal

There are four industry standard PC133 memory module sockets on the Netra X1 server's system board. To see the location of the memory modules inside the server, see FIGURE 8-5 or the underside of the server's top cover.

## ▼ To Install and Remove Memory

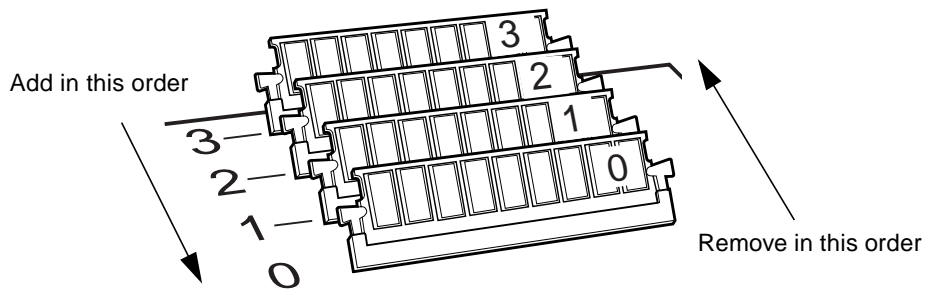
- If the server is not in use, go straight to Step 1.
- If the server is already in use, see "To Change Components In a Netra X1 Server That Is In Use" on page 88.

**1. Place the unit on an ESD surface and attach an antistatic wrist strap (see FIGURE 8-2)**

**2. Remove the server's top cover (see "To Remove the Top Cover" on page 89).**

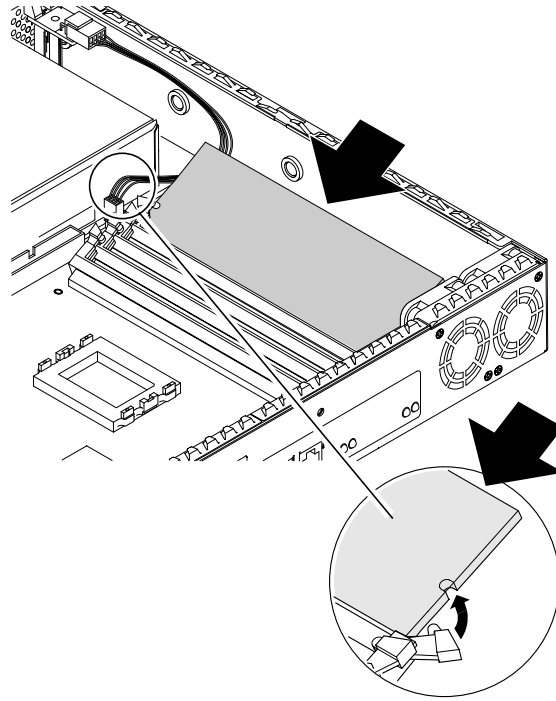
**3. Insert the memory module in the next vacant DIMM socket.**

The memory slots are numbered 3, 2, 1, 0. Add DIMMS in that order.



**FIGURE 8-6** DIMM Insertion and Removal Sequence

**4. Press the memory module until the latches at the sides of the socket click into place.**



**FIGURE 8-7** Installing Memory Into a Socket on the System Board

5. If you are removing memory, open the latches and remove the module(s) in the order 0, 1, 2, 3.
6. Replace the system cover and tighten the captive screw (see FIGURE 8-4).

---

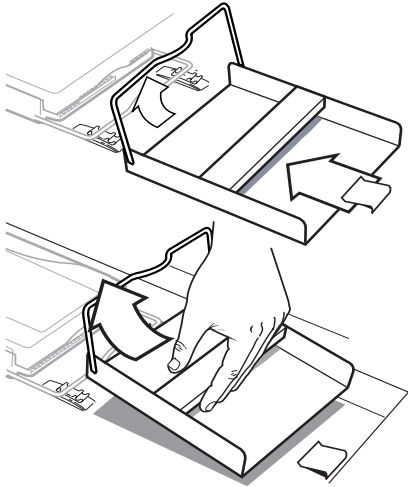
## Hard Disk Drive (HDD) Installation and Removal

The server can accept two HDDs, which are numbered 0 and 1. To see the position of each HDD, see FIGURE 8-5 or the underside of the server's top cover.

### ▼ To Install a Hard Disk Drive

- If the Netra X1 server is not in use, go straight to Step 1.

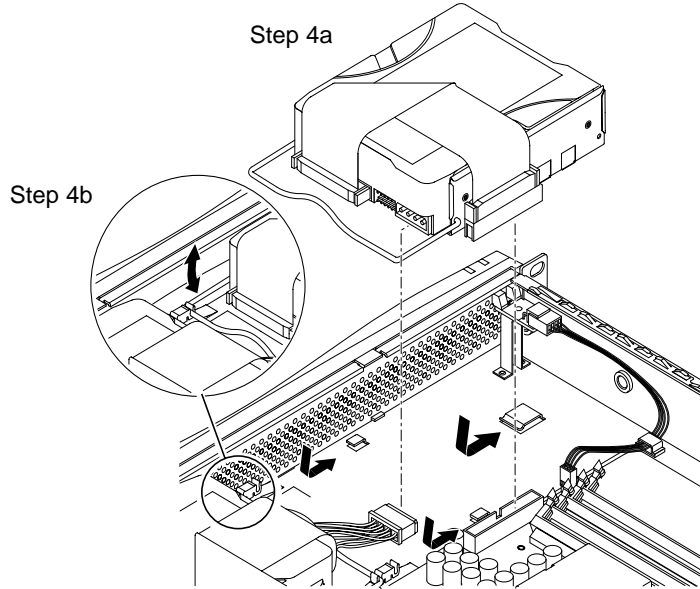
- If the server is already in use, see “To Change Components In a Netra X1 Server That Is In Use” on page 88.
1. Place the unit on an ESD surface and attach an antistatic wrist strap (see FIGURE 8-2).
  2. Remove the server’s top cover (see “To Remove the Top Cover” on page 89).
  3. Remove the metal placeholder if your server has one (if it was configured with a single hard disk drive, the second hard disk drive slot will have the placeholder installed).



**FIGURE 8-8** Removing the HDD Placeholder

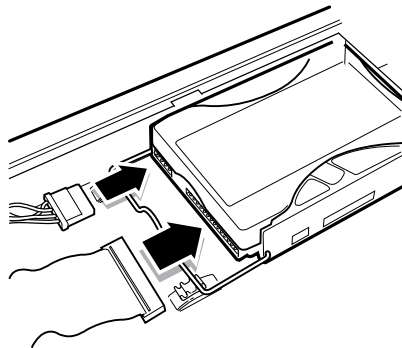
4. Insert and align the new hard disk drive (see FIGURE 8-9).
  - a. Position HDD and slide onto the clips on the base of the server.
  - b. Press the handle into the two clips on the base of the server.





**FIGURE 8-9** Installing a Hard Disk Drive

**5. Attach the power and data cables.**



**FIGURE 8-10** Attaching the Power and Data Cables

**6. Replace the system cover and tighten the captive screw (see FIGURE 8-4).**

## ▼ To Remove a Hard Disk Drive

- If the Netra X1 server is not in use, go straight to Step 1.
  - If the server is already in use, see “To Change Components In a Netra X1 Server That Is In Use” on page 88.
1. **Place the unit on an ESD surface and attach an antistatic wrist strap (see FIGURE 8-2).**
  2. **Remove the server’s top cover (see “To Remove the Top Cover” on page 89).**
  3. **Disconnect the data and power cables.**
  4. **Unfasten the hard disk drive’s handle from the two clips securing it.**
  5. **Slide the hard disk drive towards the centre of the server until it is free from the clips on the base of the server.**
  6. **Lift the hard disk drive up and out of the server.**

# Reinstalling a Netra X1 With the Solaris 8 Operating Environment

---

This chapter explains how to reinstall the Solaris 8 operating environment from a network install server. It contains the following section:

- “Re-installing the Solaris 8 Operating Environment” on page 98
- “Creating a Network Install Server” on page 100

---

# Re-installing the Solaris 8 Operating Environment

---

**Note** – The earliest version of the Solaris 8 operating environment supported on the Netra X1 server is Solaris 8 (10/00).

---

The Netra X1 server comes pre-installed with:

- The Solaris 8 operating environment (64 bit).
- Lights Out Management (LOM) packages.
- The Netra X1 dmfe Fast Ethernet driver.

Because the Netra X1 server does not contain a CD-ROM drive, if you need to re-install the Solaris 8 operating environment, you must do so from a network install server which does have a CD-ROM drive.

Further information about installing the Solaris 8 operating environment from a network install server is available in the *Solaris 8 Advanced Installation Guide* (806-0957-10), which is supplied with the Solaris 8 operating environment CDs. It can also be downloaded from <http://docs.sun.com>.

Before you create a network install server, there are some software updates, specific to the Netra X1 server, which you must install onto the system you will use as a network install server. The following section tells you how to do this.

## ▼ To Download the Netra X1 Mandatory Software for the Network Install Server

1. **On the system you are going to use as the network install server, make a directory called `/var/tmp/netra-x1` by typing:**

```
# mkdir -m 755 /var/tmp/netra-x1
```

2. **Go to <http://www.sun.com/netra> and, in the ‘Downloads’ section, click on ‘Netra X1 Software Drivers’.**

(If you have not used the download service before, you will be invited to register before proceeding.)

3. **Log into the download service.**

4. Click “Download Netra X1 Driver Software” and save the packages to the directory `/var/tmp/netra-x1`.

The file you download is called `mis.netra-x1.259-3836-03.zip`. This file contains the following Netra X1 specific software:

- Netra X1 dmfe Fast Ethernet driver.
- Lights Out Management (LOM) packages.
- The patches listed in Table 9-1.

(This is the correct version number at the time of writing. Because this file is likely to be updated, the final two digits in the name of the file you download may be higher than -03. This indicates that you are downloading the most recent version of the software updates for the Netra X1 Server.)

5. At the Solaris prompt on the system you are going to use as the network install server, unzip the files you have downloaded. To do this, type:

```
# cd /var/tmp/netra-x1
# unzip mis.netra-x1.259-3836-03.zip
```

---

**Note** – The software updates you have downloaded include all the mandatory patches for Solaris and the Netra X1 server: you do not need to download these patches separately. However, you can download and find information about the latest software patches for both the Netra X1 server and the Solaris operating environment at <http://sunsolve.sun.com>.

---

**TABLE 9-1** Patches Included in the Netra X1 Server Software Updates

Patch Number	Patch Title
110383-01 or later	SunOS 5.8: libnvpair patch
108528-07 or later	SunOS 5.8: kernel update patch
108664-06 or later	SunOS 5.8: Support for Network Service
109793-07 or later	SunOS 5.8: su driver patch
108974-09 or later	SunOS 5.8: dada, uata, dad, sd and scsi patch
110208-09 or later	Netra Lights Out Management 2.0 patch
110693-01 or later	Netra X1 dmfe ethernet driver, Link light
111092-02 or later	Netra X1 time of day driver

---

# Creating a Network Install Server

To install the Solaris software over the network, you must create an install server. This section describes how to set up an install server on the same subnet as the system you are about to install, by copying the Solaris 8 CD images to the server's hard disk drive.

The following procedure refers to Chapter 9 ("Preparing to Install Solaris Software Over the Network") on page 209 of the *Solaris 8 Advanced Installation Guide* (806-0957-10). This document is supplied with the Solaris 8 software CDs. The beginning of the chapter provides background information.

## ▼ To Create an Install Server

1. **On the system that is going to be the install server, log in and become superuser.**

This system must include a CD-ROM drive and be part of the site's network and name service. The system must also be in the NIS or NIS+ name service. If your site does not use the NIS or NIS+ name service, you must distribute information about this system by following your site's policies.

---

**Note** – This procedure assumes that the system is running Volume Manager. If you are not using Volume Manager to manage diskettes and CDs, refer to the *System Administration Guide, Volume 1* for detailed information about managing removable media without Volume Manager.

---

2. **Insert the CD labelled Solaris 8 Software 1 of 2 SPARC Platform Edition into the system's CD-ROM drive.**
3. **If necessary, mount the CD.**  
Volume Manager automatically mounts the CD.
4. **Change to the `Tools` directory on the mounted CD. Type:**

```
# cd /cdrom/cdrom0/s0/Solaris_8/Tools
```

5. Copy the CD in the CD-ROM drive to the install server's hard disk by using the `setup_install_server` command:

```
# ./setup_install_server install_dir_path
```

where *install\_dir\_path* specifies the directory where the CD image is to be copied. The directory must be empty.

---

**Note** – The `setup_install_server` command indicates whether or not there is enough disk space available for the Solaris 8 software CD images. To determine available disk space, use the `df -k1` command.

---

6. Eject the Solaris 8 Software 1 of 2 CD:

```
# cd /  
# eject
```

7. Insert the CD labelled Solaris 8 Software 2 of 2 SPARC Platform Edition into the system's CD-ROM drive.

8. If necessary, mount the CD.

Volume Manager automatically mounts the CD.

9. Change to the `Tools` directory on the mounted CD:

```
# cd /cdrom/cdrom0/Solaris_8/Tools
```

10. Copy the CD in the CD-ROM drive to the install server's hard disk by using the `add_to_install_server` command:

```
# ./add_to_install_server install_dir_path
```

where *install\_dir\_path* specifies the directory where the CD image is to be copied.

11. Eject the Solaris 8 Software 2 of 2 CD:

```
# cd /  
# eject
```

12. Insert the CD labelled Solaris 8 Languages SPARC Platform Edition.

**13. If necessary, mount the CD.**

Volume Manager automatically mounts the CD.

**14. Change to the `Tools` directory on the mounted CD:**

```
# cd /cdrom/cdrom0/Tools
```

**15. Copy the CD in the CD-ROM drive to the install server's hard disk by using the `add_to_install_server` command:**

```
# ./add_to_install_server install_dir_path
```

where *install\_dir\_path* specifies the directory where the CD image is to be copied.

**16. Eject the Solaris 8 Languages SPARC Platform Edition CD.**

```
# cd /  
# eject
```

**17. Change to the directory in which you placed `mis.netra-x1.259-3836-03.zip` by typing:**

```
# cd /var/tmp/netra-x1
```

**18. Add the patches and packages automatically to the network install server image by typing:**

```
# ./modify_install_server -d install_dir_path
```

where *install\_dir\_path* is the path to the install image on your install server.

## Setting Up Systems to Be Installed Over the Network With `add_install_client`

- If the details of the system you are installing are held in a name service such as NIS or NIS+, see "To Set Up a System That is In a Name Service" on page 103.



- If the details of the system you are installing are *not* held in a name service such as NIS or NIS+, see “To Set Up a System That is Not In a Name Service” on page 103.

## ▼ To Set Up a System That is In a Name Service

1. Become superuser on the install server.
2. Ensure that the following information about the system to be installed has been added to the name service:
  - Host name.
  - IP address
  - Ethernet address
3. Change to the `Tools` directory within the install image:

```
# cd install_dir_path/Solaris_8/Tools
```

4. Use the `add_install_client` command to set up a system to be installed over the network:

```
# ./add_install_client host_name platform_group
```

Where *host\_name* is the name of the machine to be installed and where *platform\_group* is `sun4u`.

## ▼ To Set Up a System That is Not In a Name Service

1. Become superuser on the install server.
2. Use the `obp banner` command to find out the system’s Ethernet address of the system you want to install. On that system type:

```
ok banner
Sun Netra X1 (UltraSPARC-IIe 400MHz), No Keyboard
OpenBoot 4.0, 512 MB memory installed, Serial #16634592.
Ethernet address 8:0:20:fd:d2:e0, Host ID: 80fdd2e0.
```

3. Change to the `Tools` directory within the install image:

```
# cd install_dir_path/Solaris_8/Tools
```

4. Obtain the IP address allocated to the machine you are about to install from your system administrator.

5. Use the `add_install_client` command to set up a system to be installed over the network:

```
# ./add_install_client -i IP_address -e Ethernet_address host_name  
platform_group
```

Where *IP\_address* is provided by your system administrator, *Ethernet\_address* is from step 2, *host\_name* is the name of the machine to be installed, and *platform\_group* is `sun4u`.

For example:

```
# ./add_install_client -i 123.123.123.42 -e 08:00:20:fd:d2:e0  
myhost sun4u
```

```
Adding IP address for myhost to /etc/hosts  
Adding Ethernet number for myhost to /etc/ethers  
making /tftpboot  
enabling tftp in /etc/inetd.conf  
updating /etc/bootparams  
copying inetboot to /tftpboot
```

```
#
```

## ▼ Installing the New Image From the Network Install Server

When you have finished setting up the install server, you are ready to install the new image on to the client (in this case, the Netra X1 Server).

- **If you are performing a custom jumpstart installation (as described in Chapter 6, 7 and 10 of the *Solaris 8 Advanced Installation Guide*) then, at the Netra X1 Server you are installing the new image onto, type:**

```
ok boot net - install
```

- **If you are performing an interactive installation (as described in Chapter 5 of the *Solaris 8 Advanced Installation Guide*) then, at the Netra X1 Server you are installing the new image onto, type:**

```
ok boot net
```



# Troubleshooting

---

This chapter describes the diagnostics tools you can use with the Netra X1 server, lists some of the problems you might encounter when setting up or using a server, and gives information to help fix those problems. The information is contained in the following sections:

- “Diagnostic Tools” on page 108
- “Problems You Might Encounter” on page 112
- “Frequently Asked Questions” on page 116

---

# Diagnostic Tools

The following troubleshooting tools are available for the Netra X1 server:

- Power On Self Test (POST) Diagnostics
- OpenBoot Diagnostics (OBDiag)
- SunVTS

## POST Diagnostics

To view Power On Self Test (POST) diagnostic and error messages you need to have a serial connection set up to the server. For more information, see “Setting Up a Console Connection to the Server” on page 16.

If the OpenBoot PROM (OBP) variable `diag-switch?` is set to `true`, then POST diagnostics will run automatically when you power on the server. However, the default setting for `diag-switch?` is `false`.

To initialize POST diagnostics, you need to set the `diag-switch?` variable to `true` and `diag-level` to `max` or `min`, and then power cycle the server. From the `ok` prompt:

### 1. Type:

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

### 2. Type:

```
ok reset-all
```

The system will now run POST diagnostics and display status and error messages in your console window. If POST detects an error, it displays an error message describing the failure. A sample error message is shown below:

```
Power On Self Test Failed. Cause: DIMM U0702 or System Board
```

# OpenBoot Diagnostics (OBDiag)

Like POST diagnostics, OpenBoot Diagnostics can be run if the `diag-switch?` variable is set to `true`.

You can also run OBDiag interactively and select which tests you want it to perform. To do so, follow the steps below from the `ok` prompt.

## 1. Type:

```
ok setenv diag-switch? true
ok setenv auto-boot? false
ok reset-all
```

## 2. Type:

```
ok obdiag
```

This displays the OBDiag menu. Note the number that corresponds to the test you want to perform and use it with the `test` command.

## 3. Type:

```
obdiag> test 2
Hit the spacebar to interrupt testing
Testing /pci@1f,0/ethernet@5 .....passed

Hit any key to return to the main menu.
```

When you have finished testing, exit OBDiag and then restore the the value of `auto-boot?` to `true`.

## 4. Type:

```
obdiag> exit
ok setenv auto-boot? true
auto-boot? = true
ok boot
```

## Setting the Diagnostic Level for POST and OBDiag

There are three levels of diagnostic testing available for OBDiag and POST diagnostics:

- *max* (maximum level)
- *min* (minimum level)
- *off* (no testing)

Set the testing level with the OpenBoot PROM variable called `diag-level`. The default setting for `diag-level` is `min`. The test level is set from the `ok` prompt. To set the test level:

● **Type:**

```
ok setenv diag-level value
```

## SunVTS

SunVTS, the Sun Validation and Test Suite, is an online diagnostics tool which you can use to verify the configuration and functionality of hardware controllers, devices and platforms. It runs in the Solaris 8 operating environment using any of the following:

- command line interface
- serial (tty) interface
- graphical interface within a windowed desktop environment.

SunVTS software lets you view and control a testing session on a remotely connected server. Below is a list of example tests:

**TABLE 10-1** SunVTS Tests

SunVTS Test	Description
disktest	Verifies local disk drives
fputest	Checks the floating-point unit
nettest	Checks all the hardware associated with networking (for example, Ethernet, token ring, quad Ethernet, fiber optic, 100-Mbit per second Ethernet devices)
pmem	Tests the physical memory (read only)
sutest	Tests the server's on-board serial ports
vmem	Tests the virtual memory (a combination of the swap partition and the physical memory)



## To Find Out If SunVTS is Installed

To check whether SunVTS is installed:

- **Type:**

```
# pkginfo -l SUNWvts
```

- If SunVTS software is loaded, information about the package will be displayed.
- If SunVTS software is not loaded, you will see the following error message:

```
ERROR: information for "SUNWvts" was not found
```

## Installing SunVTS

By default, SunVTS is not installed on the Netra X1 server. However, it is available by downloading patch number 110353 from <http://www.sun.com/sunsolve>. The default directory to use when you install SunVTS software is `/opt/SUNWvts`.

## Using SunVTS Software

To test a Netra X1 server by running a SunVTS session from a workstation using the SunVTS graphical user interface, follow the procedure below.

1. **Use the `xhost` command to give the remote server access to the local display.**

**Type:**

```
# /usr/openwin/bin/xhost + remote_hostname
```

2. **Remotely log in to the server as superuser or root.**

3. **Type:**

```
# cd /opt/SUNWvts/bin  
# ./sunvts -display local_hostname:0
```

Where `local_hostname` is the name of the workstation you are using.

---

**Note** – The directory `/opt/SUNWvts/bin` is the default directory for SunVTS software. If you have the software installed in a different directory, use that path instead.

---

When you start SunVTS software, the SunVTS kernel probes the test system devices and displays the results on the Test Selection panel. There is an associated SunVTS test for each hardware device on your system.

You can fine-tune your testing session by selecting the appropriate check boxes for each of the tests you want to run.

---

## Problems You Might Encounter

This section outlines some particular problems you might encounter when setting up and using the Netra X1 server and, where applicable, tells you where to look in the *Netra X1 Server User's Guide* for more information.

### Power On Failure

If the system does not power on when you apply power to the server:

- Ensure that the power cord is properly connected to the system and to the wall receptacle. Verify that the wall receptacle is supplying AC power to the system.

If the wall receptacle AC power has been verified, but the system does not power on, the system power supply may be defective.

### Cannot Set Up a Console Connection to the Server

The Netra X1 server's serial port pinouts are listed in "Setting Up a Console Connection to the Server" on page 16. Verify that they are correct for the device (that is, the terminal or terminal server) that you are connecting to the Netra X1 server.

### No LOM Messages Displayed at the Terminal

You will only see LOM messages displayed at your terminal if you are connected to the server using the A LOM port. If you are connected through the Serial B port, then you need to switch serial ports.

## Cannot Display the lom> Prompt Using the #. Escape Sequence

Check whether the first character of the #. escape sequence has been changed (this is a user-configurable value). To check the current value, type the following from the Solaris prompt:

```
# lom -c
```

The information that this command displays includes the serial escape character. If this is not "#", then type the character that is currently specified and follow it immediately with a dot.

## Problems Connecting to the Server Using a Handheld Device

Having Sync Manager turned on causes problems when you try to establish a connection to the server from a handheld device: make sure that Sync Manager is turned off.

## Cannot Display the lom> or Solaris Prompt, Cannot Access the Server From the Console, or Receiving Corrupted Text at the Console on Serial A/LOM

First, try resetting LOMlite2. To do this, connect remotely (using the `rlogin hostname` or `telnet hostname` command), and type:

```
# lom -G resetlom
```

If resetting LOMlite2 does not fix the problem, reprogram it by using the firmware supplied in patch 110208-xx. First apply the patch, and then download the new firmware by typing:

```
# lom -G default
```

## OpenBoot PROM Initialization Aborts and the Server Will Not Boot

If the message “NO IDPROM” is displayed when the operating system attempts to read the serial number and MAC address, the OpenBoot PROM initialization sequence aborts. This could be caused by either of the following:

- Incorrectly fitted System Configuration Card (SCC).
- No valid System Configuration Card inserted.

The SCC contains the serial number, MAC address, and NVRAM settings for the Netra X1 server. Check that the card is correctly inserted by pressing it firmly home. If the server still will not boot, you may need to replace the System Configuration Card. See your Sun sales representative.

## IDE Controller Failure

The probe-IDE diagnostic transmits an inquiry command to internal and external IDE devices connected to the system’s on-board IDE interface. If the IDE device is connected and active, the target address, unit number, device type, and manufacturer name are displayed. Initialize the probe-IDE diagnostic by typing the probe-ide command at the ok prompt. The following code example shows the probe-IDE diagnostic:

```
ok probe-ide
Device 0 ( Primary Master )
ATA Model: ST34342A
Device 1 ( Primary Slave )
ATA Model: ST34342A
ok
```

# DIMM Failure

At times, the operating environment, diagnostic program, or POST might not display a DIMM location (U number) as part of a memory error message. In this situation, the only available information is a physical memory address and failing byte (or bit). The following table lists physical memory addresses that can be used to locate a defective DIMM.

**TABLE 10-2** DIMM Physical Memory Address

DIMM Slot	Physical Address Range	DIMM Starting Address (Hex)
DIMM 0 (U2)	0 to 256MB	0X 00000000
DIMM1 (U3)	256MB to 512MB	0X 20000000
DIMM2 (U4)	512MB to 768MB	0X 40000000
DIMM3 (U5)	768MB to 1024MB	0X 60000000

# Jumper Settings

The default settings for the jumpers are shown below. Do not change these settings.

Jumper Name	Jumper Setting*	Jumper Setting**
JP1	1-2	1-2
JP3	Not used.	Not used.
JP7	1-2, 3-4, 5-6.	1-2, 5-6.
JP8	Not used.	Not used.
JP9	1-2	1-2
JP13	Jumper not fitted.	Jumper not fitted.
JP14	Jumper not fitted.	Jumper not fitted.
JP15	1-2	1-2
JP16	Jumper not fitted.	Jumper not fitted.
JP18	Jumper not fitted.	Jumper not fitted.
JP19	Jumper not fitted.	Jumper not fitted.

\* 380-0425-xx, 380-0426-xx, 380-0427-xx

\*\* 380-0460-xx, 380-0461-xx, 380-0462-xx, 380-0463-xx

---

# Frequently Asked Questions

---

**Note** – FAQ information is also available from <http://www.sun.com/netra/netrax/X1/faq.html>

---

## *How Does the Netra X1 Server differ from the Netra T1 AC200 Server?*

Differences are shown below, marked in bold text.

**TABLE 10-3** Netra T1 AC100 and Netra X1 Comparison

	<b>Netra T1 AC200</b>	<b>Netra X1</b>
Processor	1 x UltraSparc IIe	1 x UltraSparc IIe
Speed	500 MHz	400* or 500** MHz
Cache	256KB on chip	256KB on chip
Disk	2 x 18GB SCSI hotswap CDROM	<b>1 x 20GB IDE, expandable to 2 (400 MHz)* or 1 x 40GB IDE, expandable to 2 (500 MHz)**: no hotswap, no CDROM</b>
IO	1 full length PCI slot	<b>No PCI slot</b>
Ethernet	2 x 10/100 Ethernet	2 x 10/100 Ethernet
External SCSI	Yes	<b>No</b>
USB	2	2
Memory	256MB-2GB standard PC133	<b>128MB to 1GB (400 MHz)* or 128MB to 2GB (500 MHz)** std. PC133</b>
Lights Out Management	LOMLite2	LOMLite2
Power	AC/DC (DC to be released after AC release date)	<b>AC only</b>
Physical	1U, 19" depth	<b>1U, 13" depth</b>
NEBS	Expected after release date	<b>no NEBS</b>

\* Sun part nos: 380-0425-xx, 380-0426-xx, 380-0427-xx  
\*\* Sun part nos: 380-0460-xx, 380-0461-xx, 380-0462-xx, 380-0463-xx

---

### *What hardware configurations is the Netra X1 available in?*

The Netra X1 server is available in the following configurations:

<b>Processor</b>	<b>RAM</b>	<b>Hard Disk Drive</b>	<b>Sun Part Number</b>
400MHz	128MB	1 * 20GB (5400rpm)	380-0425-xx
400MHz	512MB	1 * 20GB (5400rpm)	380-0426-xx
400MHz	1GB (4 * 256MB)	2 * 20GB (5400rpm)	380-0427-xx
500MHz	128MB	1 * 40GB (7200 rpm)	380-0460-xx
500MHz	512MB(2 * 256MB)	1 * 40GB (7200 rpm)	380-0461-xx
500MHz	1GB (4 * 256MB)	2 * 40GB (7200 rpm)	380-0462-xx
500MHz	2GB (4 * 512MB)	2 * 40GB (7200 rpm)	380-0463-xx

### *What software is preinstalled?*

The Netra X1 server comes preinstalled with the Solaris 8 operating environment (64 bit) including LOMlite2. For more information, see “Preinstalled Software” on page 3.

### *Can I install a 32-bit kernel?*

The server will only support a 64 bit kernel. Applications written for 32 bit or 64 bit environments, and which do not rely on 32 bit kernel drivers specifically, should work without modification.

### *Will my 32 bit application work on the Netra X1 server?*

32 bit applications should work without modification, as long as they were written to be dynamically linked. If not, they will not work with Solaris 8 (64 bit).

### *Where can I get more information on the Solaris operating environment?*

All Solaris documentation is available online and can be downloaded in PDF format from <http://docs.sun.com>

### *What are the Netra X1 server's expandability options?*

The Netra X1 provides simplified expansion options, which are outlined below. You cannot upgrade the CPU, and the server does not ship with PCI slots. Optional components and part numbers are listed in "Optional Components" on page 4.

<b>Processor</b>	<b>Expandability options</b>
400 MHz*	Up to 1GB of memory and up to two 20GB IDE drives (5400 rpm).
500 MHz**	Up to 2GB of memory and up to two 40GB IDE drives (7200 rpm).

\* Sun part nos: 380-0425-xx, 380-0426-xx, 380-0427-xx  
\*\* Sun part nos: 380-0460-xx, 380-0461-xx, 380-0462-xx, 380-0463-xx

### *Can I install my own PC DIMM memory?*

Doing so risks breaking your warranty. Only Sun service personnel should install memory and only Sun certified memory may be used.

### *Can I boot the server from an external CDROM connected to the USB ports?*

No. USB devices are not widely supported by the Solaris 8 operating environment and no device drivers are available.

### *What peripherals can I connect to the USB ports?*

Currently, the Solaris 8 operating environment ships with minimal USB driver support and the only USB peripheral supported is the keyboard used with SunRay systems.

### *What information does the System Configuration Card hold?*

The System Configuration Card contains:

- the only copy of NVRAM
- IDPROM
  - host ID
  - MAC address



### *Should I put a server into stand-by mode before removing a System Configuration Card?*

Yes. The correct procedure for removing cards is described in “To Swap the System Configuration Card (SCC) Between Servers” on page 86.

### *What if a System Configuration Card is lost?*

You can order a new card from your local Sun Customer Solution Centre.

### *Is there a DC version of the Netra X1 server?*

There are no plans to introduce a DC version of the Netra X1 server.

### *What size racks can I mount the server in?*

The Netra X1 server comes prepared for installation into 19-inch racks straight out of the box, and no rack mount kit is required. No other rack sizes are supported.

### *How many Netra X1 servers can be put in a standard 19-inch rack?*

Physically and electrically, you can put up to 40 Netra X1 servers into a standard 19-inch rack with two 20-amp circuits. However, a more practical deployment would be 32 servers in a rack with termservers, network gear, and additional power strips.

### *Where do I connect my monitor, keyboard, and mouse?*

Because the Netra X1 server has been designed as a rack-mount compute element, there is no keyboard, mouse or parallel port on the Netra X1 server. To manage the server, you have to connect to the console (ttya) port and manage via a console connection. Two USB ports are available for adding a keyboard and/or mouse if needed.

### *What is ASR (Automatic Server Restart)?*

Automatic Server Restart is a feature of Lights-Out Management that can automatically restart the Netra X1 server in the event of the operating system locking up. The feature can be turned on or off and is fully configurable.

*Why are two Ethernet 10/100 ports included with the Netra X1 server?*

The most common deployment for a server in use at a service provider is to have two physical network connections to each server. One is for the production network, the other for the administrative or backup network. Each is a separate physical port, usually connecting to separate network switches. This provides better redundancy, in case of error, and increased isolation, for security.

*Why does the Netra X1 server use RJ-45 instead of DB-9 or DB-25 connectors for the serial port?*

The Netra X1 server uses RJ-45 connectors for its serial ports because these connectors best suit service providers' systems. With RJ-45 connectors, you can use standard Category 5 network cables without needing any extra adaptors. With DB-9 or DB-25 connectors, you would need to use extra adaptors to use the standard Category 5 network cable.

*Do the serial ports support synchronous protocols?*

No.

*Will the server need a null-modem cable to connect to the console port?*

No. Because the Netra X1 requires the use of console port, Sun has designed the server so that a null-modem cable is not needed. A standard Category 5 cable connected between a Netra X1 server and a termserver is all you need.

*How can I configure the dmfe driver to operate at different link parameters?*

By default, the dmfe drivers (dmfe0 and dmfe1) select the link speed (100 Mbps or 10 Mbps) and operation mode (full-duplex or half-duplex) by auto-negotiation, from the following list of options as described in the 100Base-TX standard:

- 100 Mbps, full-duplex
- 100 Mbps, half-duplex
- 10 Mbps, full-duplex
- 10 Mbps, half-duplex

The auto-negotiation protocol automatically selects the highest-throughput settings supported by both link partners.

However, if you need to set either the speed or duplex setting manually (for example, if the dmfe device is connected to a hub that does not support auto-negotiation), you can change the entries in the dmfe driver configuration file:

```
/platform/SUNW,UltraAX-i2/kernel/drv/dmfe.conf
```

- Speed

Set to 10 or 100 to force the dmfe device to operate at the specified speed.

- Full-duplex

Set to 0 to disable full-duplex, set to 1 to force full-duplex operation.

Ensure you set *both* parameters to match the requirements of the external device.

---

**Note** – By specifying either the speed or full-duplex setting yourself, you disable auto-negotiation. Therefore, if you set only one of the two parameters, the other will not be determined automatically by the driver.

---

### *Can I change the dmfe link settings using ndd?*

Yes, dmfe supports the setting of link parameters using ndd.

Specify `/dev/dmfe0` or `/dev/dmfe1` when using ndd instead of setting the instance. The `link_speed` value returns 10 or 100 indicating 10 or 100Mbit operation:

```
# ndd /dev/dmfe0 \?  
?  
link_status (read only)  
link_speed (read only)  
link_mode (read only)  
adv_autoneg_cap (read and write)  
adv_100fdx_cap (read and write)  
adv_100hdx_cap (read and write)  
adv_10fdx_cap (read and write)  
adv_10hdx_cap (read and write)
```

To force a specific link setting:

1. Set three of the four variables to 0:

```
# ndd -set /dev/dmfe1 adv_10hdx_cap 0  
# ndd -set /dev/dmfe1 adv_10fdx_cap 0  
# ndd -set /dev/dmfe1 adv_100hdx_cap 0
```

2. Set the variable you want to force to 1:

```
# ndd -set /dev/dmfe1 adv_100fdx_cap 1
```

3. Set `adv_autoneg_cap` to 0:

```
# ndd -set /dev/dmfe[01] adv_autoneg_cap 0
```

This command causes the driver to disable auto-negotiation and re-evaluate the settings of the other four variables to determine which transfer speed and mode is required. To re-enable autonegotiation, set `adv_autoneg_cap` to 1; the other variables are not checked when autonegotiation is in effect.

To change the selected mode when not using autonegotiation:

1. Select the required mode by setting the first four variables.

2. Set `adv_autoneg_cap` to 0.

Setting `adv_autoneg_cap` causes the other values to be re-evaluated.

---

**Note** – Use the configuration file `dmfe.conf` to make permanent changes to the `dmfe` link settings. Refer to the `dmfe(7d)` man page for more information.

---

The parameters supported by each driver may change in subsequent releases. Like programs that read `/dev/kmem`, user programs or shell scripts that execute `ndd` should be prepared for parameter names to change. The `ioctl()` command that `ndd` uses to communicate with drivers could change in future releases, so avoid having user programs depend upon it. The meanings of many `ndd` parameters can vary, according to how the `dmfe` driver is implemented.

Only *total autonegotiation* or *no autonegotiation* (link settings completely determined by software parameters) is supported by `dmfe`. It does not support *restricted autonegotiation* (where the software parameters select multiple options and autonegotiation determines which of these options to use).