To locate the files:

1. **Dial in to:**
   - **(310) 348-8638 (Hayes-compatible 2400/1200 baud) or**
   - **(310) 348-8641 (USR V.32bis 9600 baud).**
2. **Log in as** `guest`**, using the password** `guest1`**.**
3. **Go to the directory** `/unix/solaris/notebook`**.**

To get information on how to download files, access the Help menu on the Main Menu bar or call SunSoft Customer Support at (310) 348-6070.

Electronic Distribution Sources

You can download the Solaris Notebook Supplement files from the following electronic sources:

Note – For your convenience, the server `ftp.uu.net` contains (in addition to `zip` files) Solaris Notebook Supplement files that have been archived and compressed by using the Solaris `tar` and `compress` commands `(ns24gd.tar.Z, ns24ns.tar.Z)`.

- Internet File Transfer

  To locate the files:

  1. **`ftp` to the server `ftp.uu.net`.**
  2. **Log in as `anonymous`, using your complete e-mail address as the password.**
  3. **Go to the directory `/vendor/sun/sun-doc/notebook`.**

- SunSoft Forum on CompuServe

  To locate the files:

  1. **Dial in to CompuServe.**
  2. **Type `go sunsoft` at the CompuServe Main Menu to access the SunSoft Forum.**
  3. **Go to the `Solaris X86` library.**

  To get a CompuServe account or information on how to download files, call CompuServe at (800) 524-3388, ext. 524.

- SunSoft BBS

  The SunSoft BBS provides support for VT100™ and AT386 terminal emulations and for the Xmodem, Ymodem, Kermit, and Blast file transfer protocols.

Electronic Distribution Information C

This appendix describes how you can obtain the Solaris Notebook Supplement from electronic sources.

Files to Download

The Solaris Notebook Supplement files to download are:

- `nsread.txt`

  An ASCII file, which you should download and read first. It contains the names of the files listed here and their descriptions, as well as instructions for producing media on Solaris and DOS systems. It may also contain important notes and the names of other files to download.

- `ns24gd.zip`

  A `zip` file containing the *Solaris 2.4 x86 Notebook Supplement Guide* in both PostScript™ and ASCII format.

- `ns24ns.zip`

  A `zip` file containing the image for the Notebook Supplement diskette that is used to boot and install a notebook from a CD-ROM or from a network. After you `unzip` the image, transfer it to a 3.5-inch 1.44 Mbyte diskette.

- `DD.EXE`

  The DOS executable program used to transfer the Notebook Supplement diskette image to a DOS diskette; you can also use the Solaris `dd` command.

Twinhead Slimnote II

Installation

This machine has been successfully installed through a Xircom PE3 and a Trantor T348 card. It has not been tested yet with installation devices that connect to a docking bay.

Configuration for OpenWindows

Pointing Device

The integrated trackball acts as a PS/2 mouse connected to a keyboard mouse port.

Graphics Adapter and PMI Files

This adapter is based on a WD90C24 graphics adapter. The preferred configuration for it is:

```
16 Color, 640x480 VGA panning @800x600
```

Or, if you want panning disabled, the configuration is:

```
16 Color, 640x480 VGA
```

To obtain 640x480 resolution with 256 colors, or a 1024x768 resolution with 256 colors on an external monitor, use the Solaris 2.4 PMI file `SUNWvga8/wd90c24am.pmi` by selecting:

```
T3400ct, T4700ct, T4800ct, Twinhead 486E, ThinkPad 750: WD90C24 w/1Mb;
```

Power Management

The Suspend/Resume mode on this machine works with Solaris 2.4. You can suspend Solaris by closing the lid, and when you open the lid again and press the spacebar, Solaris resumes automatically where it left off.

Other Known Problems

Solaris 2.4 does not support PCMCIA devices.

Power Management

The Suspend/Resume mode on these machines does not properly restore the state of the screen if you are in OpenWindows with an 8-bit color mode at the time of the suspend. To avoid this problem, you must use a 4-bit color mode or exit OpenWindows before suspending these machines.

Other Known Problems

Solaris 2.4 does not support PCMCIA devices.

Toshiba T4700/Toshiba T4800

Installation

These machines have been successfully installed through a Xircom PE3, a Trantor T348, an SMC 8013, and an Adaptec 1542C card.

Note – Before using the Adaptec 1542C card, you must reconfigure the DMA speed on the DeskStation IV docking bay as described in “Reconfiguring the DMA Speed for High-Speed DMA Devices” on page 78.

Configuration for OpenWindows

Pointing Device

The integrated trackball acts as a PS/2 mouse connected to a keyboard mouse port.

Graphics Adapter and PMI File

This adapter is based on a WD90C24 graphics adapter. The preferred configuration for it is:

```
16 Color, 640x480 VGA panning @800x600
```

Or, if you want panning disabled, the configuration is:

```
16 Color, 640x480 VGA
```

To obtain 640x480 resolution with 256 colors, or a 1024x768 resolution with 256 colors on an external monitor, use the Solaris 2.4 PMI file `SUNWvga8/wd90c24am.pmi` by selecting:

```
T3400ct, T4700ct, T4800ct, Twinhead 486E, ThinkPad 750: WD90C24 w/1Mb;
```

Power Management

The Suspend/Resume mode on this machine does not properly restore the state of the screen if you are in OpenWindows with an 8-bit color mode at the time of the suspend. To avoid this problem, you must use a 4-bit color mode or exit OpenWindows before suspending the machine.

Other Known Problems

Solaris 2.4 does not support PCMCIA devices.

Toshiba T4600

Installation

This machine has been successfully installed through a Xircom PE3, a Trantor T348, an SMC 8013, and an Adaptec 1542C card.

Note – Before using the Adaptec 1542C card, you must reconfigure the DMA speed on the DeskStation IV docking bay as described in "Reconfiguring the DMA Speed for High-Speed DMA Devices" on page 78.

Configuration for OpenWindows

Pointing Device

The integrated trackball acts as a PS/2 mouse connected to a keyboard mouse port.

Graphics Adapter and PMI File

This adapter is based on a WD90C26 graphics adapter. The preferred configuration for it is:

```
16 Color, 640x480 VGA panning @800x600
```

Or, if you want panning disabled, the configuration is:

```
16 Color, 640x480 VGA
```

If you want to use this adapter in a 640x480 mode with 256 colors, the Solaris 2.4 PMI file name to select is:

```
Toshiba 4600c or AST PowerExec 4/33SL: WD90C26 256 color TFT;
```

To obtain 800x600 or 1024x768 resolution with 16 colors on an external monitor, use the PMI file `SUNWvga4/tosh4600c.pmi` by selecting:

```
Toshiba T4600c: wd90c26 @ 800x600-4 or 1024x768-4 ext CRT;
```

Graphics Adapter and PMI File

This adapter is based on a WD90C30 graphics adapter. The preferred configuration for it is:

```
16 Color, 640x480 VGA panning @800x600
```

Or, if you want panning disabled, the configuration is:

```
16 Color, 640x480 VGA
```

If you want to use this adapter in a 640x480 mode with 256 colors, the Solaris 2.4 PMI file name to select is:

```
Toshiba T4400C portable. Active Matrix TFT 256 colors;
```

A PMI file to support an external monitor at higher resolutions is not yet available for this machine.

Power Management

This machine has no firmware power management features.

Other Known Problems

None.

Toshiba T4400

Installation

This machine has been successfully installed through a Xircom PE3, a Trantor T348, an SMC 8013, and an Adaptec 1542C card.

Note – Before using the Adaptec 1542C card, you must reconfigure the DMA speed on the DeskStation IV docking bay (described below).

Reconfiguring the DMA Speed for High-Speed DMA Devices

As shipped, the DMA speed on the DeskStation IV docking bay is not set to handle high-speed DMA devices. Before a Toshiba T4400, T4600, T4700, or T4800 can use a high-speed DMA device, such as the Adaptec 1542C, the DMA speed on the DeskStation IV docking bay must be reconfigured.

On older DeskStation IV models (PA2700U with 8 DIP switches), to reconfigure the DMA speed:

- **Set switch 7 to off.**

On new DeskStation IV models (PA2701U) with a single configuration switch on the back, to reconfigure the DMA speed:

- **Set the configuration switch to off (to the left).**

Configuration for OpenWindows

Pointing Device

Since the Toshiba T4400 is not shipped with a pointing device, the configuration will depend on the pointing device you select. You can connect a serial mouse to this machine's `COM1` port and a PS/2-compatible mouse to its keyboard mouse port; the latter does not accept a serial mouse.

Power Management

The Boot/Resume mode and power consumption control (Fn+F2) on this machine work with Solaris. When using the Boot/Resume mode, be aware of the following:

- The system can only resume if the BIOS understands the screen state at the time the system was suspended. You can resume if you were in the standard 80x25 text mode, or if you were in a 4-bit 640x480 mode. If you are using OpenWindows with 640x480x8 mode or with a higher resolution mode on an external monitor, the Resume feature will not work.
- The key sequence to toggle between the Boot and Resume modes (Fn+F3) is `????` recognized by the BIOS and so does not work under Solaris. You can toggle between these modes only when your system is running DOS or is at one of the two boot prompts (partition or boot options selection).
- If you are in Resume mode, but the system is locked up and you cannot return to Boot mode to reboot the system, press the (hidden) reset button to force a hard reboot.

Other Known Problems

- Solaris 2.4 does not support PCMCIA devices.
- This machine is only available with a 120-Mbyte disk and 12 Mbytes of memory. Larger disks may be obtained from third-party sources.

Toshiba T3400 (Portégé)

Installation

This machine has been successfully installed through a Xircom PE3. Because it does not have a docking bay, this machine cannot be installed through standard network or SCSI cards.

Configuration for OpenWindows

Pointing Device

The integrated trackball acts as a PS/2 two-button mouse connected to a PS/2 keyboard mouse port. You may want to increase the mouse acceleration when using this device (for example, `xset m 3 1`).

Graphics Adapter and PMI File

This adapter is based on a WD90C24 graphics adapter. The preferred configuration for it is:

```
16 Color, 640x480 VGA panning @800x600
```

Or, if you want panning disabled, the configuration is:

```
16 Color, 640x480 VGA
```

To obtain 640x480 resolution with 256 colors, or a 1024x768 resolution with 256 colors on an external monitor, use the Solaris 2.4 PMI file `SUNWvga8/wd90c24am.pmi` by selecting:

```
T3400ct, T4700ct, T4800ct, Twinhead 486E, ThinkPad 750: WD90C24 w/1Mb;
```

Toshiba T1950

Installation

This machine has been successfully installed through a Xircom PE3. Because it does not have a docking bay, this machine cannot be installed through standard network or SCSI cards.

Configuration for OpenWindows

Pointing Device

The integrated power-point device acts as a PS/2 two-button mouse connected to a PS/2 keyboard mouse port.

Graphics Adapter and PMI File

This adapter is based on a WD90C24 graphics adapter. The preferred configuration for it is:

```
16 Color, 640x480 VGA panning @800x600
```

Or, if you want panning disabled, the configuration is:

```
16 Color, 640x480 VGA
```

To obtain 640x480 resolution with 256 colors, or a 1024x768 resolution with 256 colors on an external monitor, use the Solaris 2.4 PMI file `SUNWvga8/wd90c24am.pmi` by selecting:

```
T3400ct, T4700ct, T4800ct, Twinhead 486E, ThinkPad 750: WD90C24 w/1Mb;
```

Power Management

The power management features on this machine have not yet been tested.

Other Known Problems

Solaris 2.4 does not support PCMCIA devices.

Texas Instruments 4000M/25

Installation

This machine has been successfully installed through a Xircom PE3. It has not been tested yet with installation devices that connect to a docking bay.

Configuration for OpenWindows

Pointing Device

The power-point device acts as PS/2 two-button mouse connected to a PS/2 keyboard mouse port.

Graphics Adapter and PMI File

This adapter is based on a Cirrus Logic GD6440 graphics adapter. The preferred configuration for it is:

```
16 Color, 640x480 VGA panning @800x600
```

Or, if you want panning disabled, the configuration is:

```
16 Color, 640x480 VGA
```

If you want to use this adapter in a 640x480 mode with 256 colors, the Solaris 2.4 PMI file name to select is:

```
TI TravelMate 4000E 256 color TFT display;
```

A PMI file to support an external monitor at higher resolutions is not yet available for this machine.

Power Management

The power management features on this machine have not yet been tested.

Other Known Problems

Solaris 2.4 does not support PCMCIA devices.

Texas Instruments 4000E

Installation

This machine has been successfully installed through a Xircom PE3 and a Trantor T348 card. It has not been tested yet with installation devices that connect to a docking bay.

Configuration for OpenWindows

Pointing Device

The QuickPort mouse acts as PS/2 two-button mouse connected to a nonstandard mouse port. A driver for this device (`tiqmouse`) is included in the Solaris Notebook Supplement.

Graphics Adapter and PMI File

This adapter is based on a Cirrus Logic GD6420 graphics adapter. The preferred configuration for it is:

```
16 Color, 640x480 VGA panning @800x600
```

Or, if you want panning disabled, the configuration is:

```
16 Color, 640x480 VGA
```

If you want to use this adapter in a 640x480 mode with 256 colors, the Solaris 2.4 PMI file name to select is:

```
TI TravelMate 4000E 256 color TFT display;
```

A PMI file to support an external monitor at higher resolutions is not yet available for this machine.

Power Management

This machine has no Suspend/Resume capability.

Other Known Problems

None.

Panasonic CF-V21P

Installation

This machine has been successfully installed through a Xircom PE3 and a Trantor T348 card.

Configuration for OpenWindows

Pointing Device

The integrated trackball acts as a PS/2 mouse connected to a keyboard mouse port.

Graphics Adapter and PMI File

This adapter is based on a WD90C24 graphics adapter. The preferred configuration for it is:

```
16 Color, 640x480 VGA panning @800x600
```

Or, if you want panning disabled, the configuration is:

```
16 Color, 640x480 VGA
```

To obtain 640x480 resolution with 256 colors, or a 1024x768 resolution with 256 colors on an external monitor, use the Solaris 2.4 PMI file `SUNWvga8/wd90c24am.pmi` by selecting:

```
T3400ct, T4700ct, T4800ct, Twinhead 486E, ThinkPad 750: WD90C24 w/1Mb;
```

Power Management

The automatic power management features of this notebook computer have not been tested with Solaris 2.4.

Other Known Problems

Solaris 2.4 does not support PCMCIA devices.

Power Management

The Suspend/Resume mode on this machine works with Solaris under OpenWindows, although the Save to Disk feature should (in most cases) be disabled. For optimum performance, set power management parameters (`P` menu on the setup screen) so that Power Management is set to `HIGH` and Slow CPU Speed When Idle is set to `DISABLE`.

Other Known Problems

- While OpenWindows was running, using the function key for switching between the LCD and the external monitor did not work at the time this book was written; however, it was possible to switch to the LCD or to an external monitor before starting OpenWindows.
- Solaris 2.4 does not support PCMCIA devices.

NEC Versa/50

Installation

This machine has been successfully installed through a Xircom PE3 card.

Configuration for OpenWindows

Pointing Device

The integrated trackball acts as a PS/2 mouse connected to a keyboard mouse port.

Graphics Adapter and PMI File

This adapter is based on a WD90C24 graphics adapter. The preferred configuration for it is:

```
16 Color, 640x480 VGA panning @800x600
```

Or, if you want panning disabled, the configuration is:

```
16 Color, 640x480 VGA
```

If you want to use this adapter in a 640x480 mode with 256 colors, the Solaris 2.4 PMI file name to select is:

```
NEC Versa 50Mhz: WD90C24 256 color TFT;
```

To obtain 800x600 or 1024x768 resolution with 16 colors on an external monitor, use the PMI file `SUNWvga4/versa50-4.pmi` by selecting:

```
NEC Versa 50Mhz: wd90c24 @ 800x600-4 or 1024x768-4 ext CRT;
```

Power Management

The Suspend/Resume mode on this machine works with Solaris under OpenWindows, although the Save to Disk feature should (in most cases) be disabled. For optimum performance, set power management parameters (`P` menu on the setup screen) so that Power Management is set to `HIGH` and Slow CPU Speed When Idle is set to `DISABLE`.

Other Known Problems

Solaris 2.4 does not support PCMCIA devices.

NEC Versa/33

Installation

This machine has been successfully installed through a Xircom PE3 and a Trantor T348 card. It has not been installed through the SMC 8013 or the Adaptec 1542C card. Installation attempts through devices connected to a docking bay fail; UNIX is not a supported operating system, according to NEC Customer Support.

Configuration for OpenWindows

Pointing Device

The integrated trackball acts as a PS/2 mouse connected to a keyboard mouse port.

Graphics Adapter and PMI File

This adapter is based on a Chips & Technology 6553 graphics adapter. The preferred configuration for it is:

```
16 Color, 640x480 VGA panning @800x600
```

Or, if you want panning disabled, the configuration is:

```
16 Color, 640x480 VGA
```

If you want to use this adapter in a 640x480 mode with 256 colors, the Solaris 2.4 PMI file name to select is:

```
NEC UltraLite Versa 256 color Active Matrix Display;
```

A PMI file to support an external monitor at higher resolutions is not yet available for this machine.

Power Management

The Stand-By and Suspend/Resume modes (controlled by Fn-F3 and Fn-F4) work normally. The Hibernate mode only works if you created the appropriate hibernation file. The power consumption modes (Fn-F11) are difficult to use because the Power meter will not display under the UNIX system.

Other Known Problems

- Solaris 2.4 does not support PCMCIA devices.
- Solaris 2.4 does not support the sound chip in this machine.

IBM ThinkPad 750

Installation

This machine has been successfully installed through a Xircom PE3 and an SMC 8013 card. It has not yet been installed through an Adaptec 1542C. To use the Xircom card, you must configure the parallel port as unidirectional.

Configuration for OpenWindows

Pointing Device

The integrated power-point device acts as a PS/2 mouse connected to a keyboard mouse port.

Graphics Adapter and PMI File

This adapter is based on a WD90C24 graphics adapter. The preferred configuration for it is:

```
16 Color, 640x480 VGA panning @800x600
```

Or, if you want panning disabled, the configuration is:

```
16 Color, 640x480 VGA
```

To obtain 640x480 resolution with 256 colors, or a 1024x768 resolution with 256 colors on an external monitor, use the Solaris 2.4 PMI file `SUNWvga8/wd90c24am.pmi` by selecting:

```
T3400ct, T4700ct, T4800ct, Twinhead 486E, ThinkPad 750: WD90C24 w/1Mb;
```

Power Management

The Standby/Resume facility and the Power Conservation features work as described in the manual distributed with these machines.

To display the Power Level and Power Management menus, press Fn+F7 and Fn+F8 respectively.

Other Known Problems

None.

Compaq LTE 4/25, 4/33

Installation

These two machines are supported in a similar way, and they have been installed through a Xircom PE3, a Trantor T348, and an SMC 8013 card; they have not yet been installed through an Adaptec 1542C.

Configuration for OpenWindows

Pointing Device

The integrated trackball acts as a two-button Microsoft mouse and should be configured in a way that doesn’t conflict with other cards. If you don’t need the `COM1` port, disable the motherboard serial port and configure the trackball as `COM1`. Otherwise, be sure that no other devices need the `COM2` port (0x2f8) and IRQ 3. Note that this conflicts with the default IRQ for some network cards.

Graphics Adapters and PMI File

This adapter is based on a Compaq Super VGA video chip. The preferred configuration for it is:

```
16 Color, 640x480 VGA panning @800x600
```

Or, if you want panning disabled, the configuration is:

```
16 Color, 640x480 VGA
```

If you want to use this adapter in a 640x480 mode with 256 colors, the Solaris 2.4 PMI file name to select is:

```
COMPAQ LTE Lite 4/25c;
```

A PMI file to support an external monitor at higher resolutions is not yet available for this machine.

Power Management

The Pause/Resume mode on this machine works with Solaris 2.4. You can suspend Solaris by closing the lid, and when you open the lid again and press the spacebar, Solaris resumes automatically where it left off.

Other Known Problems

Solaris 2.4 does not support PCMCIA devices.

AST PowerExec 4/33SL

Installation

This machine has been successfully installed through a Xircom PE3, a Trantor T348, and an SMC 8013 card. It has not yet been installed through an Adaptec 1542C.

Configuration for OpenWindows

Pointing Device

The front-mount trackball acts as a PS/2 mouse connected to the keyboard mouse port.

Graphics Adapter and PMI File

This adapter is based on a WD90C26 graphics adapter. The preferred configuration for it is:

```
16 Color, 640x480 VGA panning @800x600
```

Or, if you want panning disabled, the configuration is:

```
16 Color, 640x480 VGA
```

If you want to use this adapter in a 640x480 mode with 256 colors, the Solaris 2.4 PMI file name to select is:

```
Toshiba 4600c or AST PowerExec 4/33SL: WD90C26 256 color TFT;
```

To obtain 800x600 or 1024x768 resolution with 16 colors on an external monitor, use the PMI file `SUNWvga4/ast486sl.pmi` by selecting:

```
AST PowerExec 486SL/33: wd90c26 @ 800x600-4 or 1024x768-4 ext CRT;
```

Ambra [PENDING as of 8/22 pm]

Installation

This machine has been successfully installed through a ...???????

Configuration for OpenWindows

Pointing Device

The integrated trackball acts as a PS/2 mouse connected to a keyboard mouse port???

Graphics Adapter and PMI File

This adapter is based on a ... graphics adapter. The preferred configuration for it is:

```
16 Color, 640x480 VGA panning @800x600  ???
```

Or, if you want panning disabled, the configuration is:

```
16 Color, 640x480 VGA ????
```

????To obtain 640x480 resolution with 256 colors, or a 1024x768 resolution with 256 colors on an external monitor, use the Solaris 2.4 PMI file `SUNWvga8/wd90c24am.pmi` by selecting:

```
T3400ct, T4700ct, T4800ct, Twinhead 486E, ThinkPad 750: WD90C24 w/1Mb; ??
```

Power Management

?????The automatic power management features of this notebook computer have not been tested with Solaris 2.4.

Other Known Problems

?????Solaris 2.4 does not support PCMCIA devices.

Reference Page Format

The types of information provided for each notebook computer are:

- **Installation**

  Describes how Solaris 2.4 can or cannot be installed on the particular notebook, and notes any special steps to take during installation and configuration.

  Generally, an attempt was made to install Solaris on each notebook computer in four different ways, by connecting:

  - A Xircom Pocket Ethernet Adapter III (Xircom PE3) to the motherboard parallel port
  - A Trantor T348 MiniSCSI Plus Parallel-to-SCSI host bus adapter (Trantor T348) to the motherboard parallel port
  - An Adaptec® 1542C SCSI host bus adapter (Adaptec 1542C) to a docking bay (io=330, irq=11, dma=6, floppy-disk disabled)
  - An SMC® 8013 Ethernet Interface (SMC 8013) to a docking bay (io=300, irq=5, mem=0xd4000)

  These are the methods that were regularly used in testing; they are not the only methods for installation.

- **Configuration for OpenWindows**

  Describes how the pointing device and the graphics adapter must be configured to run the OpenWindows environment on the particular notebook computer. This section also provides the name of the PMI file (as it appears in the Video Display Adapters menu when you run `devconfig`) needed to properly initialize each graphics adapter.

  The PMI files are distributed with Solaris 2.4. See also Chapter 6, "OpenWindows on a Notebook Computer."

- **Power Management**

  Describes the automatic power management features of the particular notebook computer and how they interact with Solaris 2.4.

- **Other Known Problems**

  Describes any other known problems with running Solaris 2.4 on this notebook computer.

Notebook Computer Reference Pages B

These reference pages contain detailed information on how to configure, install, and use most of the leading, high-end notebook computers with Solaris 2.4. Notebook computers currently not supported are listed at the end of this appendix.

Following are the notebook computers discussed in these reference pages:

- Ambra
- AST® PowerExec™ 4/33SL
- Compaq® LTE® 4/25
- Compaq LTE 4/33
- IBM ThinkPad 750
- NEC® Versa™/33
- NEC Versa/50
- Panasonic® CF-V21P
- Texas Instruments 4000E
- Texas Instruments 4000M/25
- Toshiba® T1950
- Toshiba T3400 (Portégé)
- Toshiba T4400
- Toshiba T4600
- Toshiba T4700
- Toshiba T4800
- Twinhead Slimnote II

NAME

trantor – low-level module for Trantor T348 MiniSCSI Plus Parallel-to-SCSI host bus adapter

AVAILABILITY

x86

DESCRIPTION

The **trantor** module provides low-level interface routines between the common disk/tape I/O subsystem and the Trantor T348 MiniSCSI Plus Parallel-to-SCSI host bus adapter. The Trantor T348 is a SCSI host bus adapter that plugs into a parallel port (rather than a bus slot). It offers lower performance than other host bus adapters, but has the advantage of being usable on notebook computers that cannot accept a standard host bus adapter card. Auto configuration code determines whether the adapter is present at the configured address and what types of devices are attached to it.

Board Configuration and Auto Configuration

The **trantor** driver attempts to initialize itself in accordance with the information found in the configuration file, **/kernel/drv/trantor.conf**. The relevant user configurable items in this file are:

io port "reg=0x378,0,0" "ioaddr=0x378"
IRQ level "intr=3,7"

The I/O port is the bus I/O address for the parallel port to which the Trantor T348 will be connected. The IRQ level is the level at which that parallel port generates its interrupts. The standard configuration file contains entries for the three common parallel port configurations as follows:

```
name="trantor" class="sysbus" intr=3,5 reg=0x278,0,0 ioaddr=0x278
        flow_control="dsngl" queue="qsort" disk="scdk" tape="sctp"
        tag_fctrl="dmult" tag_queue="qfifo";
name="trantor" class="sysbus" intr=3,7 reg=0x378,0,0 ioaddr=0x378
        flow_control="dsngl" queue="qsort" disk="scdk" tape="sctp"
        tag_fctrl="dmult" tag_queue="qfifo";
name="trantor" class="sysbus" intr=3,7 reg=0x3bc,0,0 ioaddr=0x3bc
        flow_control="dsngl" queue="qsort" disk="scdk" tape="sctp"
        tag_fctrl="dmult" tag_queue="qfifo";
```

Miscellaneous

The **trantor** driver can support only one T348 per system.

The **trantor** driver does not support the T348 pass-through parallel port.

The **trantor** driver does not support concurrent use of SCSI devices and any other device (such as a printer) connected to the same parallel port. All SCSI devices must be closed before any other parallel peripherals can be used.

NAME

tiqmouse – integrated mouse device interface

AVAILABILITY

x86

DESCRIPTION

Some notebook computers (notably the Texas Instruments 4000E) use a nonstandard PS/2-style QuickPort mouse interface that resembles but is not compatible with a PS/2 keyboard mouse port. The **tiqmouse** driver provides support for this alternate mouse interface. It allows applications to obtain information about the mouse's movements and the status of its buttons.

Programs are able to read directly from the device. The data returned corresponds to the byte sequences as defined in the *IBM PS/2 Technical Reference Manual*.

The **tiqmouse** driver recovers from accidental disconnection of the mouse. Detection of mouse reconnection is confirmed by a message on the system console. If the mouse is replaced and the message is not generated within 1 second, remove and replace the mouse until the message is noted.

FILES

/dev/tiqmouse

5. Turn on the power to the computer.

Warnings

- If you need to reconfigure the system later to add other devices, make sure the Trantor T348 adapter and all its devices are plugged in and turned on; otherwise they will be removed from the configuration.
- The Trantor T348 adapter and attached devices must also be powered on at boot time to be available during that session.
- Solaris does not support concurrent use of other parallel devices on the same port as the Trantor T348 or on the T348 pass-through port. If you want to switch between the T348 and some other parallel port device, such as a printer or Ethernet adapter, shut down Solaris, power off the computer, and turn off the power to any SCSI devices attached to the T348. With the power turned off, disconnect the old device and connect the new one. If switching to the T348, turn on the power to any SCSI devices you intend to use. Turn on the power to the computer and do a reconfigure reboot.

  If the SCSI devices attached to the Trantor T348 adapter fail to respond after a reconfigure reboot, and the parallel port had previously been used for a different device, it might be necessary to do a second reconfigure reboot. This situation occurs when the driver from the previous device interferes with the `trantor` driver's attempt to detect the presence of the T348 device.

Manual Pages

This section contains manual pages for the following drivers for which Solaris 2.4 does not include manual pages:

- `tiqmouse` (for the QuickPort mouse interface on the Texas Instruments 4000E notebook computer)
- `trantor` (for the Trantor T348 MiniSCSI Plus Parallel-to-SCSI HBA)

The Xircom driver automatically senses whether the parallel port is unidirectional or bidirectional and takes advantage of the faster operation that is possible with a bidirectional parallel port.

For combo (BNC and 10Base-T) adapters, the adapter will automatically sense which connector has a cable connected, and the `pe` driver will automatically be configured for that type of connection.

Solaris 2.4 includes a manual page (`pe`) for PE3.

Trantor T348 MiniSCSI Plus Parallel-to-SCSI HBA

The Trantor T348 is easy to install—it has no switches or software-setable options and does not require any manual configuration. However, it may require special cabling to obtain electrical power and to connect to certain devices.

Note – This adapter obtains its electrical power from the TERMPWR signal on the SCSI cable. The adapter will not receive power and will not work unless the first (or only) device connected to it supplies TERMPWR. If you have difficulty using this adapter with Solaris, see the “Troubleshooting Notes” section of the *MiniSCSI Plus User Guide* or consult your Trantor dealer.

The Trantor T348 host bus adapter ends in a male SCSI-1 connector, suitable for plugging into a SCSI-1 device. If you want to connect it to a SCSI-2 device, you will need a SCSI-1 to SCSI-2 cable (which has a male SCSI-1 connector on one end and a male SCSI-2 connector on the other) and a SCSI-1 female-to-female adapter (to connect the male end of the T348 to the male end of the SCSI-1 to SCSI-2 cable).

Installing the Trantor T348 Adapter

1. **Shut down Solaris (if it is already installed) and power down the computer.**
2. **Plug the T348 adapter into the selected (or only) parallel port.**
3. **Attach all required SCSI devices to the T348.**
4. **Turn on the power to all the SCSI devices.**

Notebook Device Drivers and Manual Pages

A

This appendix describes how to configure the boot/install devices connected to notebook computers so you can install and run Solaris 2.4. It also contains manual pages for drivers included in the Solaris Notebook Supplement.

Device Configuration Notes

This section describes how to configure the:

- Xircom Pocket Ethernet Adapter III (PE3), used for installing from a network
- Trantor T348 MiniSCSI Plus Parallel-to-SCSI HBA, used for installing from a CD-ROM

Xircom Pocket Ethernet Adapter III

Warning – The system should be powered down to attach the adapter, following manufacturer's instructions.

The Xircom PE3 is very easy to install—it has no switches or software-setable options and does not require any manual configuration. Just make sure that the Ethernet adapter is powered up before Solaris tries to bring up its networking services.

If you want the system to be loaded from a partition other than Solaris, such as the DOS `fdisk` partition, you can enter the number associated with it at the first boot prompt. In this way you can use the Solaris `boot` program to run either Solaris or DOS.

Ensuring That the Solaris Partition Is Active

If the installation of Solaris makes any changes to the `fdisk` partitioning, it will destroy any pre-existing DOS partition. Since most notebooks come with the entire disk dedicated to DOS/Windows, it will be necessary to repartition the disk and reinstall DOS/Windows anyway.

It is probably easiest to install Solaris first (making provisions for a DOS `fdisk` partition, as described in Chapter 4, "Disk Partitioning") and then to install DOS and Windows again after Solaris has been installed. If you install DOS/Windows after installing Solaris, the DOS partition will automatically be made the active one; to set the Solaris partition to be the active one, run the DOS `FDISK` command.

Accessing DOS Files From Solaris

You can access the files on your DOS file system while running Solaris by mounting the DOS partition as a PC file system. Use a command like:

```
mount -F pcfs /dev/dsk/c0d0p0:c /mnt/dos
```

If you anticipate accessing your DOS files often, include an entry in the `/etc/vfstab` file similar to:

```
/dev/dsk/c0d0p0:c /dev/rdsk/c0d0p1 /mnt/dos pcfs - no -
```

Solaris With DOS/Windows

9

This chapter reviews key concepts you need to be aware of if you want to install and run DOS/Windows on your notebook computer, in addition to Solaris 2.4.

Allocating Disk Space for Solaris and DOS/Windows

To allocate disk space for Solaris 2.4 and DOS/Windows, you can either use the Notebook Supplement diskette, which automatically partitions the disk or lets you customize the partitioning, or you can partition the disk yourself using the `fdisk` command. These methods are discussed in detail in Chapter 4.

Due to the relatively limited disk space on notebook computers, it is essential that you consider in advance how you want to use your notebook computer and to plan carefully for space allocation, regardless of which partitioning method you select.

Selecting Which Operating System to Boot From

The Solaris bootstrap program can be used to boot other operating systems. When you boot Solaris, a screen listing available `fdisk` partitions appears, and if you press Enter (or do nothing for 30 seconds), the system is loaded automatically from the Solaris partition.

Some notebook computers are better than others at restoring the hardware to the same state it was in prior to the shutdown. On many of them, it is possible to suspend and resume Solaris with no trouble, but a few notebooks do not properly restore the state of the graphics adapter. This is more likely to happen with an 8-bit graphics mode than a 4-bit mode. Most machines will properly Suspend/Resume if the selected display type is 640x480 resolution with 256-color mode (with or without panning). On a few machines, you can only Suspend/Resume while at the shell prompt (rather than in the OpenWindows environment).

See Appendix B, “Notebook Computer Reference Pages,” for more information on which machines can and cannot be suspended while in OpenWindows.

Do’s and Don’ts for Suspend/Resume With Solaris

- Do not change the system configuration between the time you suspend and the time you resume. In particular, do not suspend a machine that is connected to a network and resume when it is no longer connected, or when it is connected to a different network.
- Be sure that the mouse or trackball is reconnected before you resume, if you were in OpenWindows when you suspended the system. In many cases the pointing device will not work if it is connected after the machine is turned on again.
- Wait until the system is relatively idle and do a `sync` or two before you suspend it.
- Do not suspend the system while you are in the middle of updating files. If you do and the resume fails (as occasionally happens), you may lose the files being modified.

Note – If you suspend your machine, the system clock stops ticking. When you resume, the system will still think the time is what it was when you suspended your machine. You can correct this manually by using the `date` command, or you can wait a few minutes, and the system will automatically detect and correct the error.

Most notebooks come with a setup facility that enables you to configure the processor slowdown function. Some notebooks allow you to speed up or slow down the processor by pressing a function key.

Whether or not you enable this feature and when you enable it depends on the kind of work you are doing. If you are running a computationally intensive application, slowing down the processor may result in unacceptably poor performance. On the other hand, for simple operations like reading and composing mail and editing files, the difference may be almost imperceptible.

Note that changing the processor’s speed while it is running can cause erratic device operation.

Automatic Disk Shutdown

Most notebooks have an option to spin down the disk if it has not been used recently, since after the display and the processor, the disk is probably the biggest power consumer.

The automatic disk shutdown feature of most notebooks never has an opportunity to work with Solaris. This is because the Solaris software automatically resyncs the disk every 30 seconds to ensure that all pending I/O has been completed. As far as the APM BIOS can tell, Solaris is using the disk continuously. Future releases of Solaris will address this issue.

Suspend/Resume

Many notebook computers have a Suspend/Resume feature. This means that by just pressing a button or closing the lid, you can automatically save all machine state and either put the machine in an ultra-low power consumption mode or turn it off. Later, by pressing a button or opening the lid, you can restore the system to its pre-shutdown state very quickly (typically 5-10 seconds).

Most notebook computers maintain enough power on memory to keep the contents viable. Some, however, save the contents of memory to disk. If you have such a machine, make certain that the necessary partition(s) are left (or recreated) on the disk. Otherwise, installing Solaris may destroy the Suspend/Resume partitions.

The APM BIOS and Solaris

There are a few instances where Solaris uses the hardware in ways the APM BIOS never envisioned. In these cases, the APM BIOS shuts the device down properly, but when it restarts the device, the device is not properly restored to the state it was in prior to the shutdown; this may cause the new operation to fail.

See Appendix B, "Notebook Computer Reference Pages," for more detailed information about using power management on particular notebook computers.

Common Power Management Features and Solaris

The following sections describe generally how Solaris interacts with the most common automatic power management features.

Automatic Screen Blanking

The Active Matrix color displays on high-end notebook computers consume almost as much power as the CPU. Many notebooks check for keyboard or mouse activity, and if none has occurred within a reasonable period (30 seconds to 2 minutes), the display is automatically blanked. In most cases, any keystroke or mouse motion will reactivate the display. Automatic screen blanking works well with Solaris on most computers.

Most notebooks come with a setup utility that allows you to configure the time-out period. Set this to a period that works well for you. In some cases, you may want to disable the automatic screen blanking (for instance, on a machine that is running an unattended continuous demo).

Processor Speed

Many notebooks have an option to slow down the processor. By reducing the clock speed it is possible to reduce the power consumption of the processor significantly and extend the battery life. The Solaris software works well with processor slowdown on most computers.

Power Management and Solaris

8

Many notebook computers with x86 processors have automatic power management features, and Solaris 2.4 works well with many of them. This chapter provides a general description of the most common automatic power management features and how the Solaris software interacts with them.

What Is Automatic Power Management?

Power management on most x86 notebooks is implemented via the 486SL System Management Mode. This is a feature that enables power management software to run without the knowledge of the operating system, that is, as if this software were part of the hardware. The software that performs this function is generally referred to as the "Advanced Power Management BIOS" (APM BIOS).

In principle, the APM BIOS can tell whether or not a device has been used recently; if it has not been used, the device can be shut down. When the operating system attempts to use the device, the APM BIOS intercepts the operation and starts up the device again before allowing the operation to complete. In many cases, this works exactly as intended, and the power management features work automatically.

The Solaris Notebook Supplement does not include an automated means for:

- General File Reconciliation

  This would ensure that the right files are on the notebook computer before you disconnect it from the network and that all of the changes are propagated back when you reconnect it.

- Mail Reconciliation

  This would merge mailbox changes made on a disconnected notebook computer with mailbox changes that occur on a server while the notebook is disconnected.

- Calendar Reconciliation

  This would ensure that appointments made while the notebook is disconnected are transferred back to the master calendar on the server.

- Multi-Domain Operation

  This would reconfigure the notebook computer for operation in a new domain where there may be different host names and IP addresses, and different print and file servers.

Determining If the Computer Is Connected

At boot time, the startup script determines if there are any network interfaces running. If such interfaces exist, the script assumes that your notebook computer is networked; otherwise, it assumes that it isn't. This means that if your notebook is going to be booted without a network connection, you must make sure that the network interface is not connected either.

How Intermittent Connection Interacts With Suspend/Resume

The Suspend/Resume feature, which many notebook computers have, is described in "Suspend/Resume" on page 49. Since the startup script determines whether or not the system is networked during system startup, you cannot change connectivity without rebooting. This means that if your computer is connected to the network when you suspend it, it must be connected when you resume it. If the machine is disconnected when you suspend it and connected when you resume, it will not be able to use the network when it resumes.

Note – You must reboot the system to go from the connected to the disconnected state or from the disconnected to the connected state.

Problems Not Addressed

While the Solaris Notebook Supplement makes it possible to use a notebook computer in an intermittently connected fashion, it does not provide a "seamless transition" between connected and disconnected operation. A few areas not yet addressed are discussed below.

Note – Partial solutions to these problems may be available in shareware form on various electronic bulletin boards.

Scripts for Packing and Unpacking

To ensure that you always have the right files copied to or from your notebook to the network, that you always have the latest versions of calendars and mailboxes before you disconnect your computer, or both, you may want to write scripts to automate this packing and unpacking process.

Background Technical Information

This section provides more technical detail on the problems with intermittent connection and how they have been worked around in the Solaris Notebook Supplement. While some users may find this information valuable, you do not need to understand this material to configure or use an intermittently connected Solaris Notebook.

Circumventing NIS- and RPC-Related Problems

The most serious problems that occur when a Solaris Notebook is disconnected from a network have to do with NIS and RPC.

By default, NIS is consulted for password file entries, group file entries, mail aliases, automount information, and host names, among other things. If the network is not connected, these requests can take a long time to time out, and the system can slow down significantly.

Many services (like mail and calendar management) make use of RPC to communicate between clients and servers. If the network is not connected, these communication requests fail.

To work around these problems, when the system comes up, a system startup script determines if your notebook computer is connected to a network. If it is not connected, the script:

- Removes the computer from the NIS domain and causes all NIS requests to be satisfied from local files
- Changes the host mapping so the local host is reached through a software loopback rather than through a network connection

Calendar

If you are in a large network, you will probably want to maintain your calendar on a server so other users can browse it and make appointments. Putting it on a server lets users access your calendar whether or not your machine is connected to the network at the time.

If you want to have a local copy of your calendar when disconnected from the network, create two versions of `.cm.rc`. The remote version might specify:

```
Calendar.DefaultCal:    myname@bigserver
```

while the local version might specify:

```
Calendar.DefaultCal:    myname@localhost
```

To copy the calendar from the server to your local machine, use a command similar to:

```
rcp bigserver:/var/spool/calendar/callog.myname
/var/spool/calendar
```

Profiles for Local Operation

There are many reasons why you may want to use different profiles when your notebook is connected to the network and when it is not.

If you plan to use a variety of profiles, have your `.login` script test for the existence of a remote directory (for example, your home directory on the server). If the remote directory is accessible, you can assume you are connected; if it isn't accessible, you can assume that you aren't. The `.login` script can then set up your profiles (for calendar, mail, `PATH`, and so on) accordingly.

The SUNWnsdis package includes sample `.sh` and `.csh` scripts to automatically configure mail, calendar, and other features differently based on whether or not the notebook is networked. The samples can be found in `/opt/SUNWnsdis/samples/disco.{`*sh,csh*`}`.

Instead, put a copy of your local mailbox elsewhere (for example, in your local home directory). Then set the `MAIL` environment variable to the name of this file when you want to use the local copy (rather than the imported version in `/var/mail`). To do this, your login profile should include lines similar to these:

```
#see if we are networked
if [-d /home/myname]
then
    MAIL=/var/mail/myname
else
    MAIL=/export/home/myname/mailbox
fi
export MAIL
```

If you plan to work with mail a great deal when you are away (that is, using your computer as a standalone machine), it's a good idea to maintain copies of all your mail folders and to use a different `.mailrc` file when your computer is connected to the network and when it is not. If it is connected, use the mail files on the server; if it isn't connected, use the files on the local machine.

The remote version of your `.mailrc` file should include lines like:

```
set record=/home/myname/m/mymail
set folder=/home/myname/m
```

The local version of your `.mailrc` should include lines like:

```
set record=/export/home/myname/m/mymail
set folder=/export/home/myname/m
```

If you configured `sendmail` properly, you should be able to send mail while disconnected and have those messages forwarded to a mail host for delivery after reconnecting to the network and rebooting. If you want to confirm that these queued messages have been sent, copy yourself on each message, specifying your full address (as in *yourname@your_mail_hub*). You will then get your copy at the same time each message gets forwarded. If you just specify your local address, your copy will be delivered to your local host, but you will not have confirmation that the other queued messages have been sent.

Search Paths

If you have remote (non-local) directories in your search path, you may find that it takes a long time to run commands when your computer is disconnected from the network. This is because every command you type will try (unsuccessfully) to automount each directory in your search path.

There are three general ways to handle remote directories in your search path when you are on an intermittently connected computer:

- Do not include remote directories in your search path. Instead, create shell aliases for the commands that must be found in remote directories.

  If you include `/usr/dist/exe` in your search path, that directory may be searched every time you type a command. If, however, you alias `emacs` to `/usr/dist/exe/emacs`, the remote directory will be searched only when you type the command `emacs`.
- Have your `.login` script determine if your computer is networked, and initialize your `PATH` accordingly.
- Put remote directories at the end of your search path, so that local options are exhausted before trying the more risky remote ones.

  The SUNWnsdis package includes sample `.sh` and `.csh` scripts to ensure that your `PATH` variable only includes directories that are currently reachable (`/opt/SUNWnsdis/samples/path.`{*sh,csh*}).

Mail

Some desktop users like receiving mail on their local machine and others like to get mail on a mail server. However, most notebook computer users prefer to receive mail on a server, because unlike the notebook, it is always available and connected. See “Customizing the Local sendmail.cf File” on page 39. Also refer to *User Accounts, Printers, and Mail Administration* for a detailed description of `sendmail`, including hints for writing your own `sendmail` configuration file.

If you want a local copy of your mailbox so you can read your mail (and handle your backlog) when your computer is disconnected from the network, do not keep it in `/var/mail/`<*yourname*>. If you keep it there, that file (and everything you have done with it) automatically becomes invisible whenever you connect your computer to the network (and `/var/mail` is imported from your mail server).

prefer to have their mail delivered to a mail server (which is always available) and not directly to their notebooks. If you want to do this, edit the updated `/etc/mail/sendmail.cf` file that is installed when you add the SUNWnsdis package.

In the updated `/etc/mail/sendmail.cf` file, look for two sets of comments that begin with:

```
#
# NOMADIC FEATURE
#
```

The first set includes a command to define your domain name (even when you are not running NIS) so it will appear in messages sent while your machine is disconnected. The second includes a command to force all mail originated on the local machine to specify a designated mail hub as its source (rather than the local machine).

For example, if you wanted all your mail to include the domain name *corp.xyzcorp.COM* and to appear to have been sent from the host *nonstop*, after the first set of comments, you would add the line:

```
Dmcorp.xyzcorp.COM
```

and after the second set of comments, you would add the line:

```
Dknonstop
```

Helpful Hints

Local vs. Remote Home Directories

Set up your local password file entry so that you always log in to a local home directory, which contains a full set of profiles; if your notebook is disconnected, you will need this. If you are connected to the network, you can easily change directories to your home directory on a file server and automount the file system containing your networked home directory on your notebook.

Sending Mail While Off the Network

When your notebook is disconnected from the network, certain steps must be taken to ensure that any mail you send is queued for delivery by your mail server when you reconnect to the network. To do this, your system must know:

- How to queue non-local mail for delayed delivery
- That all the mail you send is not intended for delivery to local users

To enable your system to queue non-local mail for delayed delivery, add an entry to `/etc/inet/hosts` and `/etc/inet/hosts.local` that specifies an IP address and a name for your mail server, along with the alias `mailhost`. For example:

```
128,153.100.100 bigserver mailhost
```

This entry tells `sendmail` that mail for remote users should be relayed through `bigserver` and that it should be queued for delivery if that machine is not currently available.

If you send mail specifying only a local address for the recipient, such as *joe*, `sendmail` will not queue it for delivery to the mail forwarding site; rather, it will attempt to deliver it into a mailbox on the local machine. To ensure your mail is queued and forwarded, specify the recipient's address explicitly as being non-local (for example, *joe@hishos*t or *joe@ourdomain*). If you want to avoid entering the full address each time, set up a local mail alias for each person you correspond with regularly. For example, you could set up an alias that automatically replaces *joe* with *joe@ourdomain*.

If you want to send mail to aliases while your notebook is disconnected from the network, you must ensure that they are defined in your local alias or `.mailrc` file because the NIS alias map may not be available.

Customizing the Local `sendmail.cf` File

While the default `sendmail.cf` enables you to send mail from a connected or a disconnected notebook, you may want to customize this file to refine `sendmail`'s behavior.

Normally, when you send mail from a disconnected notebook, the message header indicates that the sender is *yourname@yournotebook*. If someone responds to this message, the response is sent directly to *yournotebook*. Since notebook computers may often be disconnected from the network, many users

Similarly, when you reconnect to the network, be sure to copy any changed files back to the file server.

Copies of Your Mailbox and Calendar

Like project-related files, if you want to take copies of your mailbox and calendar with you on your notebook, be sure to copy changes back to the file server when you return.

Printing

Once remote printers are configured, they work fairly automatically. If your computer is connected to the network when you send a job to a remote printer, it is printed promptly. If you send a job to the printer when your computer is disconnected from the network, it is queued and printed automatically when the computer is reconnected.

Mail

In Solaris 2.4, `sendmail` is the mail transport program that provides aliasing and forwarding, and automatic routing to network gateways. It is controlled by the default configuration file `sendmail.cf`, which is installed in the `/etc/mail` directory. See *User Accounts, Printers, and Mail Administration* for a detailed description of electronic mail services and how to set them up.

When your notebook is connected to a network, the `/var/mail` directory (where mail servers store mailboxes) is usually mounted from a remote mail server. If you send mail, the default `sendmail.cf` configuration file ensures that the mail is forwarded automatically to your mail server, which puts it in a queue for delivery to users on other machines.

Remotely Mounted NFS File Systems

Due to the relatively small disk space on notebook computers, you probably won't be able to install AnswerBook® on-line documentation and a host of other useful applications, but many of these can be obtained from a network file server. Also, since much more of your own data can be stored on a file server than you can keep on your notebook, you will probably want to mount these file systems automatically whenever you are connected to the network.

You can use the automounter if you want to access remotely mounted NFS file systems from your notebook computer. Such files are mounted only when you actually access them, and if they are not available (because your machine is not networked), the automounter procedure will fail relatively quickly and gracefully.

It is important, however, that you not depend on network file servers for critical data. Any data you need to use while your computer is disconnected must be stored on the local disk.

The use of the automounter and the configuration of remotely mounted file systems is described in *NFS Administration Guide*.

Packing and Unpacking Your Notebook Computer

Before disconnecting your notebook computer from the network to use it at home or on an airplane, for example, you must ensure that all the data you need is on the notebook. There are several types of files to consider.

Application Files

Your work may require applications that are not bundled with Solaris 2.4 or that are not installed by the Notebook Supplement diskette. Before taking your notebook with you, install any additional applications you will need.

Files You Are Working On

If most of your project-related files are stored on a file server and you want to work on a project when you aren't hooked up to the network, copy all the necessary files from the file server to your notebook computer.

7

Basic Network Configuration

To use your Solaris Notebook on a Solaris network, you must first follow the standard procedures for installing a Solaris 2.4 system on a network, which includes configuring the:

- Host name and IP address
- Network and netmask
- NIS domain
- Printers and print servers
- Mail service
- Remotely mounted NFS file systems

This is discussed in *x86: Installing Solaris Software*.

Local Login

When your notebook computer is connected to a Solaris network, NIS provides a common password file to the entire domain, and any machine you log in to can access your home directory through the NFS distributed computing environment.

When you disconnect your notebook, you need a local login in the local password file, a local home directory, and a local set of basic profiles (such as`.login`, `.profile`, `.cshrc`, `.openwin-init`, `.mailrc`, `.cm.rc`).

The home directory associated with your local login name must explicitly give the name of a directory on a local file system, and the password file entry should specify a home directory name such as `/export/home/`*yourname* (not the NIS style home directory naming, such as `/home/`*yourname*, which only works when your machine is networked).

The creation of local logins is described in *User Accounts, Printers, and Mail Administration*.

Intermittent Connection

7

With Solaris, The Network is the Computer.™ This is a source of tremendous power and convenience, until you disconnect your machine from the network. A typical Solaris workstation is configured either as a networked or standalone machine. A networked machine takes advantage of (and depends on) network services. A standalone machine is not dependent on these services, but it cannot automatically take advantage of them either.

The Solaris Notebook Supplement includes additional features that support intermittent connection, enabling you to use your notebook computer in a nomadic fashion.

When Solaris Notebooks are configured for intermittent connection, they can use all available network services (such as NIS, NFS®, RPC, printing, and mail) when connected to the network. When they are disconnected, they operate as if they had been configured for standalone use.

This chapter describes both the steps you need to take to use your notebook computer in a nomadic fashion and the configuration changes that the Notebook Supplement diskette makes to support nomadic computing.

The entries to note in the Solaris 2.4 `OWconfig` file are:

- `class="XSCREEN"`

  `XSCREEN` entries describe a display server (a general class of display adapters). For notebook computers, the relevant entries are `vga4` and `vga8` (4-bit and 8-bit VGA). These entries are referred to by the `XSCREENCONFIG` entries. You probably won't want to make any changes to an `XSCREEN` entry.

- `class="XSCREENCONFIG"`

  `XSCREENCONFIG` entries describe the configuration of a particular display adapter within a class. If you add a new PMI file, you may need to edit an `XSCREENCONFIG` entry. Fields to note in these entries are:

  - `name`
    The name of this entry, and the value that is specified in an `XDISPLAY` `ListOfScreens` attribute so you can select this entry.
  - `pmifile`
    The name of the associated PMI file used to initialize the graphics adapter.
  - `res`
    The resolution (width x height) available with this particular device.

- `class="XINPUT"`

  `XINPUT` entries describe a keyboard or pointing device. You probably will not have to make any changes to keyboard descriptions, but you may have to change mouse descriptions.

  The sample `OWconfig` file includes descriptions for a wide range of mouse and interface combinations. If you use the sample file as the basis for your customized `OWconfig` file, you should be able to just uncomment the entries you want.

  It is important that there be only *one* uncommented entry for any given special file (the `dev` attribute). Inadvertantly initializing a single input device more than once will lead to unexpected results.

- `class="XDISPLAY"`

  `XDISPLAY` entries tie together a keyboard, a pointing device, and a screen into a named display. The default display is named `0`, the secondary display is named `1`, and so on. You may want to change these entries to refer to different `XSCREENCONFIG` or `XINPUT` entries.

- In most cases, connecting an external keyboard will disable the internal keyboard. This is only a problem if you want to use the special function keys on the notebook computer's keyboard (such as the key for screen switching).

If the external keyboard does *not* have the same character set as the integrated keyboard, you must edit your `OWconfig` file as discussed below.

The `OWconfig` *File*

The configuration file `OWconfig` tells OpenWindows what display server to run, what types of display adapters are present and how to initialize them, what types of pointing devices are connected to what types of interfaces, what types of keyboards are in use, and so on. In Solaris 2.4 this file is located in `/etc/openwin/server/etc/OWconfig.`

The initial `OWconfig` file is built up on the basis of the questions asked at the beginning of the installation process about your keyboard, display, and pointer. Since this initial dialog only collects information about primary devices, you must update your `OWconfig` file to include descriptions of any secondary devices you want to use.

The Notebook Supplement includes a sample `OWconfig` file that is installed in `/opt/SUNWnsdis/samples`. This sample `OWconfig` file illustrates how a primary and secondary display device can be configured, and it contains boilerplate descriptions for all supported display adapters and pointing devices. Be sure to refer to the wide range of examples provided in the sample `OWconfig` file if you need to edit your `OWconfig` file manually.

`OWconfig` *File Entries*

There are too many possible configurations to describe in detail here, but given the examples provided in the sample `OWconfig` file and the information below on the `OWconfig` file entries, you should be able to make any necessary changes to this file yourself. (The structure of the Solaris `OWconfig` file may change from release to release.)

Note – Make a copy of the `OWconfig` file before you start your customizations so that you can recover the original file again. If errors are introduced into this file, OpenWindows will not run at all.

Using a Secondary Display

The `openwin` command used to start up OpenWindows has provisions for using secondary displays. By default `openwin` uses the display specified as `0` in the `OWconfig` file, but you can define other displays by specifying them as `1`, `2`, and so on. To start up OpenWindows using an alternate display you defined as `1` in the `OWconfig` file, for instance, you would type:

```
openwin -display :1
```

When you start up OpenWindows, you may want to be asked whether or not you are using an alternate display so you can select the primary or alternate display accordingly. If so, use the sample scripts included in the Notebook Supplement to build your personal `.login` script. These scripts are in `/opt/SUNWnsdis/samples/owstart.{sh,csh}`.

Secondary Pointing Devices

If you are using your notebook computer with an external monitor, you may prefer to use an external mouse as well. If your external mouse is compatible with the integrated pointing device (for example, a PS/2 mouse that plugs into the external mouse port on your notebook), no additional configuration is required.

To use an external mouse that is not compatible with your integrated pointing device, you must update the OpenWindows configuration to include a description of the external mouse. See "The OWconfig File" on page 33 to manually edit your `OWconfig` file.

Secondary Keyboards

Many notebooks have a jack so you can connect an external keyboard. If your external keyboard has the same character set as your integrated keyboard, no special configuration is required, although you need to be aware of the following:

- In some cases, connecting a keyboard after the machine has been turned on will suspend your machine. Most notebook computers check for the presence of an external keyboard only at boot time and will be unable to use one that is connected after the machine is turned on.

Also note the following:

- Some notebook computers automatically sense the presence of an external graphics adapter and disable the internal one.
- Other notebooks must be explicitly configured (with a *setup* utility) to be able to use an external graphics adapter.

Refer to your notebook computer's manual to see how your particular machine operates.

Configuring Secondary Devices

The Solaris 2.4 program `kdmconfig` handles the initial OpenWindows configuration of primary devices—integrated displays, pointing devices, and keyboards. To use secondary devices, however, you must update the OpenWindows configuration to include a description of those devices. You can do this by editing the `OWconfig` file included in the Notebook Supplement. See "The OWconfig File" on page 33.

Secondary Displays

To use an external monitor (connected to the integrated graphics adapter or to an external graphics adapter), you must update the OpenWindows configuration with a description of the new display device. You can do this *automatically* or *manually*, depending on your machine type.

- The Notebook Supplement includes the script `extmonitor.sh`, which automates the configuration of an external monitor for many of the leading notebooks. If `extmonitor.sh` knows about your machine, using this script is the easiest (and safest) way to add support for an external monitor.

  This script is in `/opt/SUNWnsdis/bin/extmonitor.sh`. If you run it with no arguments, it will print out a usage message and a list of supported computers and external display resolutions.
- If `extmonitor.sh` does not know about your machine, you need to manually edit your `OWconfig` file. See "The OWconfig File" on page 33.

Switching Between Displays

Note – It is generally safest to switch to the preferred display before starting up OpenWindows.

Most notebook computers that support external monitors have a function key that can be used to switch between the LCD and the external monitor, or simultaneous display on both. Most of these function keys work in essentially the same way:

- **Press once to switch from the internal to the external display.**
- **Press again to switch from external to simultaneous display on both.**
- **Press again to switch from simultaneous display on both to the internal display.**

Refer to your notebook computer's manual to see how your particular machine operates.

External Graphics Adapters

If your notebook computer has a docking bay, you have the option of putting an external graphics adapter into it. With an external graphics adapter, you can get higher resolution on an external monitor, even if the graphics adapter in your notebook is not capable of higher resolutions.

Note – Unlike an external monitor connected directly to your notebook computer, if you use an external graphics adapter, you won't be able to use the screen-switching function key on your keyboard to switch back and forth between the LCD and the external monitor.

For more prominent elements on a page, such as titles, use:

- `-b&h-lucida-bold-r-normal-sans-*-100-*-*-p-*-iso8859-1`
- `-b&h-lucida-medium-r-normal-sans-*-100-*-*-p-*-iso8859-1`

Where constant-width fonts are required, use:

- `-b&h-lucida sans typewriter-medium-r-normal-sans-*-100-*-*-p-*-iso8859-1`

In addition to fonts, there are two other useful properties:

- `OpenWindows.Scale: small`
- `*Scale: Small`

External Monitors

Many notebook computers have connectors to which an external monitor can be attached. The graphics adapters in some notebooks are capable of producing a higher than 640x480 resolution on an external monitor. If the graphics adapter in your notebook computer is capable of higher resolution, you may want to attach an external monitor to it (even if your notebook's graphics adapter is not capable of higher resolution, you may still want to attach an external monitor to use as a larger screen for the same resolution). To switch between the internal (LCD) and external (monitor) displays while OpenWindows is running, you typically use a function key. Keep the following in mind, however:

- Some notebook computers check for the presence of an external monitor only at boot time and will be unable to use one that is connected after the machine is turned on.
- Some notebook computers automatically sense the presence of an external monitor when they start up, using it and disabling the LCD (which will not illuminate).
- Some notebook computers always use the LCD when they start up and require you to explicitly switch to the external monitor.
- Some notebook computers maintain separate status information for the internal and external displays, and when you start up OpenWindows, only the active display is initialized. If you attempt to switch between these displays after starting OpenWindows, the alternate one may be unusable.
- Sometimes the image on a display distorts when you exit OpenWindows. Switching back and forth between the internal and external displays usually corrects this problem.

Configuring OpenWindows for a Small Screen

Many OpenWindows and X-Windows applications have windows that are too large for a 640x480 screen. You can usually customize these applications to display smaller windows.

Most applications automatically determine what fonts to use when you start up your windows environment. For OpenWindows, these default properties are recorded in the `.OWdefaults` file in your home directory.

Note – In versions of OpenWindows earlier than 3.3, default properties were recorded in the `.Xdefaults` file. The `.Xdefaults` file can still exist, but in OpenWindows version 3.3 and later versions, precedence is given to customizations made in `.OWdefaults`.

The Solaris Notebook Supplement provides a sample set of default properties for small screens in the file `/opt/SUNWnsdis/samples/xdefault.` You can copy it and experiment with different fonts. For more information on fonts and for a description of how the `.Xdefaults` file can be used to make additional customizations, see the *Solaris Advanced User's Guide*.

Adding lines for smaller fonts in your `.OWdefaults` file will automatically reduce the size of most windows. For OpenWindows applications, the properties you may want to override are:

- `OpenWindows.BoldFont`
- `OpenWindows.ButtonFont`
- `OpenWindows.TitleFont`
- `OpenWindows.TextFont`
- `OpenWindows.RegularFont`
- `OpenWindows.MonospaceFont`
- `OpenWindows.FontFamily`

For other applications, you may want to override the more general properties:

- `*font`
- `*Font`

After experimenting with fonts, choose those that are most readable. As a default until then, use 10-point type in the “lucida” family of fonts—they work well with a 640x480 screen.

OpenWindows on a Notebook Computer

6

This chapter describes the initial configuration of the OpenWindows software, tailoring the system for small screens, and the configuration and use of external monitors, keyboards, and pointing devices. It also provides basic information about the `OWconfig` file, the file that controls the configuration of the windows system.

Once OpenWindows is configured, you should be able to log in and run it after your system is installed.

Initial Configuration

Early in the installation you will be asked to describe your display, pointing device, and keyboard. If you don't use external devices, in most cases you can select common device options that work on most notebook computers and run OpenWindows using the integrated LCD and trackball. The display type `16 Color, 640x480 VGA panning @800x600` works for virtually all computers, and the integrated (attached) trackball on most notebooks acts like a PS/2 mouse on a keyboard mouse port.

When using optional external monitors, keyboards, and pointing devices, see Appendix B, "Notebook Computer Reference Pages." It contains specific device information to make it easier for OpenWindows to run on your particular notebook.

The Solaris Notebook Supplement contains scripts that prune out most of this potentially excess software to give you an extra 15-20 Mbytes of space for your own files. If you do a JumpStart installation, these scripts will automatically be run after the selected packages have been installed.

Customizing the Pruning Scripts

If you are concerned about exactly which programs and files will be pruned, you might want to examine and customize the pruning scripts before they are run.

The `post.cfg` script (described in "Manual Installation" on page 13) on the Notebook Supplement diskette automatically installs the pruning scripts and runs them after the installation is completed. You can prevent these scripts from being run by editing the `post.cfg` file. To do this, look near the end of this file and find the `if` statement that includes a `for` loop that runs through all of the `.zap` scripts in the `/opt/SUNWnsprn` directory; then delete or comment out this `if` statement.

Manual Selection and Pruning

Instead of accepting the default selections on the Notebook Supplement diskette or editing the `notebook.cfg` file to customize these selections, you can manually select and deselect packages according to your own needs. See *x86: Installing Solaris Software*.

Note that when you manually install the SUNWnsprn package, this only installs the pruning scripts; it does not run them. After they are installed, you can examine and customize these scripts and decide which ones to run and when. See the `README` file in the `/opt/SUNWnsprn` directory for more information on the contents of the file pruning scripts.

Customizing the Default Package Selections

Note – If you make changes to the Notebook Supplement diskette, remember to copy it first.

The file `notebook.cfg` on the Notebook Supplement diskette lists and describes the default package selections. If you want to add or delete packages, edit this file before installation. There are three types of lines in this file that are relevant to package selection:

- `cluster SUNWCuser`

  This line, which appears near the beginning of the file, specifies that the package selection should start out as the standard End User configuration.

- `package` <*name*> `add`

  Specifies the name of the package to be added to the standard End User cluster.

- package <*name*> delete

  Specifies the name of the package to be deleted from the standard End User cluster.

Post-Installation Pruning

The software packages for Solaris 2.4 were not designed with the goal of accommodating minimal disk footprints, but with the idea rooted in the UNIX® tradition of "passing on as much good stuff as possible." As a result, even a relatively small selection of packages includes many files that most users never need, as described in the following examples.

- The basic set of OpenWindows fonts includes not only standard fonts like Lucida and Helvetica, but also more esoteric ones like AvantGarde, Bembo, GillSans, and Zapf Dingbats.
- The basic set of OpenWindows software includes many utilities that may only be useful to a handful of "X-hackers."

SUNWolbk, SUNWoldcv

Include on-line documentation for many DeskSet™ clients and the DocViewer and HelpViewer tools used for navigating that documentation. Since you can obtain this documentation from a server when your notebook is networked, you can save a lot of disk space by excluding these packages.

SUNWxglrt, SUNWxgldg, SUNWxgler, SUNWxglft

Provide support for high performance 3-D graphics. You won't be able to use these on your 640x480 notebook screen.

SUNWs53

Includes support for old-style AT&T System V.3 file systems. It is very unlikely that such a disk will ever be hooked up to your notebook.

SUNWscpr, SUNWscpu

Include popular `/usr/ucb` commands that are not in System V. If you know and love these commands, you will probably want to include these packages; otherwise, you'll never miss them.

SUNWter

Contains `terminfo` descriptions for terminals other than console devices and Shell Tool and Command Tool windows. Since you are not likely to connect other types of terminals to your machine, you probably won't need these descriptions.

SUNWvolu, SUNWvolr, SUNWvolg

Contain the Volume Manager, a tool for automatically mounting CD-ROMs and diskettes. If you don't import such media or are comfortable using the `mount` command, you don't need to install these packages.

SUNWbnuu, SUNWbnur

Provide UUCP and CU networking and are not included by default. Add these packages if you want to use UUCP or CU for networking from your notebook.

SUNWxwoft, SUNWxwcft

Contain a large number of fonts that you almost surely don't want, but they also contain some fixed pitch fonts that you might find useful on small screens. If you like to experiment with font properties, you may want to install these packages.

SUNWloc, SUNWploc

Provide non-English localization support. If you are an English speaking user, it is unlikely that you will need these packages.

SUNWinst

Contains the Software Manager, a tool for installing and removing Solaris 2.4 packages. Consider including this package if you anticipate adding or removing packages frequently and don't want to use the `pkgadd` command.

Not Recommended

SUNWaudio, SunWolaud

Contain audio record and playback applications. Since very few notebooks include sound devices, these tools are not likely to be useful.

SUNWdoc

Contains `nroff/troff` related programs, font descriptions, and macro files.

- Do a manual installation, selecting the mix of packages you want, and then manually pruning as you see fit. (See "Manual Selection and Pruning" and "Post-Installation Pruning" later in this chapter.)

Package Options

The following sections include recommendations on which packages you might add to the standard End User cluster and which ones to keep or remove.

Consider

SUNWapppr, SUNWapppu, SUNWpppk

Contain software that implements point-to-point protocols (PPP) for efficient networking over a high-speed serial line (such as a 9600 or 1.4-Kbyte modem). You are likely to use your notebook computer for high-speed modem communications.

SUNWadmr, SUNWadmfw, SUNWadmap

Contain various parts of `admintool` and are included by default. Consider removing them if you are comfortable editing your own `passwd`, `group`, `hosts`, and other configuration files.

SUNWlpu, SUNWlpr, SUNWlps

Provide local and remote printer support. SUNWlpu and SUNWlpr are included by default and contain print spooling software used with both local and remote printers. SUNWlps provides support for local printers and is not included by default.

If you don't use printers from your notebook, you might want to remove SUNWlpu and SUNWlpr entirely. If you plan to connect local printers to your notebook, you might want to include SUNWlps.

Package Selection

5

This chapter summarizes what you need to consider when selecting packages so Solaris 2.4 can run on a smaller notebook computer disk. It also describes the various package selection options provided by the Solaris Notebook Supplement.

Package Selection Options

Since Solaris 2.4 was targeted toward high-end workstations with larger disks, you need to be selective in which packages you install on your notebook computer. For this reason, you must:

- Install a relatively sparse subset of the available packages.
- Prune out the software (included in those packages) that you're not likely to need.

There are three ways to proceed with package selection. You can:

- Do a JumpStart installation, accepting the recommended package selections and pruning. (See "JumpStart Installation" in Chapter 3.)
- Do a JumpStart installation after making changes to the package selection lists, the pruning scripts in the default profile, or both. (See "Customizing the Default Package Selections" and "Customizing the Pruning Scripts" later in this chapter.)

To create additional slices within the Solaris `fdisk` partition, add new `filesys` keyword lines to the `notebook.cfg` file. For instance, to take space out of the root file system to create an 85-Mbyte `/usr` file system and a 30-Mbyte `/export/home` file system, use the following instructions:

```
partitioning explicit
filesys c0d0s1   30        swap
filesys c0d0s3   85        /usr
filesys c0d0s4   30        /export/home
filesys c0d0s0   free     /
```

Manual Disk Partitioning

To create a DOS partition that meets your own space and location requirements, you can manually partition the disk before installing Solaris. The Solaris installation will then leave that partition intact and allocate the remaining free space to Solaris. If there isn't enough free space on your disk to create a viable Solaris partition, the installation aborts.

Customizing the Default Partitioning

You can override the default disk partitioning by editing the `notebook.cfg` file, which contains the profiled installation instructions that define how Solaris software is installed on a system. The beginning of this file contains a brief description of how to use `fdisk` and `filesys`, the profile keywords for disk partitioning. See the chapter on preparing custom JumpStart installations in *x86: Installing Solaris Software* for a full description of how you can use different profile keywords and profile values to control the installation of Solaris on your system.

`fdisk` Partitioning

By default the Notebook Supplement diskette leaves all existing partitions intact. The existing DOS partition is left intact and so is the Solaris partition, if it already exists on your disk. If a Solaris partition doesn't exist, a new one is created using all the available free space. If there isn't enough free space on your disk to create a viable Solaris partition, the installation aborts.

Default `fdisk` partitioning can be changed by adding new `fdisk` keyword lines to the `notebook.cfg` file.

However, the easiest way to change the default `fdisk` partitioning is to use the DOS `FDISK` program to modify your partition sizes before starting the Solaris installation. If you want your entire disk to be used for a Solaris partition, delete all existing partitions. If you want some space to be reserved for other partitions, explicitly create those partitions prior to starting the Solaris installation. Be sure to leave enough room for the Solaris partition.

Solaris Partitioning

Near the beginning of the `notebook.cfg` file, you will see these lines:

```
partitioning explicit
filesys c0d0s1   30        swap
filesys c0d0s0   free      /
```

These instructions tell the installation program to create a 30-Mbyte swap region and then to put all the remaining free space into a single `root` file system. This provides for the most efficient use of a small disk.

Allocating Space for and Dividing the Solaris Partition

There are two things to consider when determining the Solaris partition space requirements:

- How much space to reserve for the SWAP partition
- How to divide the space in the partition into file systems

The Notebook Supplement diskette contains instructions to automatically allocate a 30-Mbyte swap area, and then to allocate the remainder of the space to a single Solaris file system. If this is not what you want, customize the Solaris partitioning instructions on the Notebook Supplement diskette or do a manual installation.

Guidelines to Help You Determine Space Requirements

Here are some guidelines to help you divide your Solaris partition:

- The recommended space allocation for the swap area is 20-30 Mbytes.
- The recommended space allocation for Solaris files is at least 100 Mbytes.
- Keep in mind that you need to allocate space for all the application and data files you will want to add to your notebook computer.
- The Solaris space must be divided into at least two slices (a `root` slice and a `swap` slice).
- Decide if you will want to create more than two slices for other file systems, keeping in mind these advantages and disadvantages:
  - The advantage of creating separate file systems (such as `/opt` for unbundled software and `/export/home` for your own data) is that they can be automatically preserved when you reinstall a new release of Solaris.
  - The advantage of having a single file system is that it maximizes free space: rather than having 5-10 Mbytes of free space in each of four file systems, you can have 20-40 Mbytes of free space in a single file system.

Deciding If You Want a DOS Partition

If you only plan to run Solaris on your notebook computer, you do not need to allocate space for a DOS partition; you can use all of the available space for Solaris.

However, since many users want both Solaris and DOS partitions, the Notebook Supplement diskette, as distributed, contains instructions to leave any existing DOS partition intact and create a new Solaris partition with all the remaining free space on the disk. If this is not what you want, customize the disk partitioning instructions on the Notebook Supplement diskette or do a manual installation.

Note – If you make changes to the Notebook Supplement diskette, remember to copy it first.

Note – If you customize the space and location requirements of the DOS partition, you may want to back up your important DOS files before installing the Solaris Notebook Supplement.

Note – If you override the default disk partitioning instructions on the Notebook Supplement diskette, you will need to install (or reinstall) DOS (and possibly Windows) after the Solaris installation has been completed.

Guidelines to Help You Decide

If you decide to maintain both Solaris and DOS partitions on your notebook, you may have to make some compromises. The following space requirement guidelines are provided to help you decide if you want a DOS partition:

- If you only need a DOS partition for a few miscellaneous DOS utilities (maintenance/setup utilities, COM software, and a game or two), a 5-10 Mbyte DOS partition should be adequate.
- If you want to install Windows in your DOS partition, an extra 20-40 Mbytes will be required.
- If you want to install large DOS/Windows applications, another 20-40 Mbytes of space may be required for each of them.

Disk Partitioning 4

Because notebook computers have relatively small disks, how space is allocated to the Solaris and DOS partitions and among Solaris slices is important. This chapter describes what you need to consider when partitioning your disk and modifying the default partitioning in the Notebook Supplement diskette.

Disk Partitioning Options

There are two disk partitioning decisions you must make:

- How much space to allocate for the Solaris operating environment and how much space to leave for other operating systems (such as DOS/Windows)
- How to divide the Solaris partition into file systems and swap space

There are three ways to proceed with disk partitioning. You can:

- Do a JumpStart installation, using the recommended disk partitioning. (See “JumpStart Installation” in Chapter 3.)
- Do a JumpStart installation after making changes to the partitioning instructions in the default profile. (See “Customizing the Default Partitioning” in this chapter.)
- Do a manual installation and create the Solaris partition and slices yourself. (See “Manual Installation” in Chapter 3 and “Manual Disk Partitioning” in this chapter.)

- Runs a number of bug workaround scripts located in the `scripts` subdirectory.
- Runs the pruning scripts in SUNWnsprn.

When installing any of these packages or running these scripts manually, you must do so before rebooting the system (and though you may choose not to install SUNWnsdrv, you will most likely want to install SUNWnsdis and run the bug workaround scripts).

Caution – Select the option *not* to reboot at the end of the installation if you want to install any packages yourself or run the bug workaround or pruning scripts manually; otherwise, your system may not come up.

The scripts on the Notebook Supplement diskette assume that the following environment variables are set:

`SI_CONFIG_DIR`	Directory where the diskette is mounted
`BASEDIR`	Root directory for the newly installed system

- When the system returns to a shell prompt after installation, the newly installed system will be mounted under `/a`.

Post-Installation Configuration

Before you disconnect your notebook to use it as a standalone machine, do the following:

- Set up a local home directory and profiles to use when your notebook is not connected to a Solaris network.
- Learn to handle mail, printing, and calendars on an intermittently connected notebook computer, as described in Chapter 7, “Intermittent Connection.”

Both of these operations can be performed after the system has been installed and rebooted.

6. **If asked, provide additional information about your network, your local time zone, and the current date and time.**

After you have answered these questions, the Notebook Supplement diskette will automatically partition your disk, install the appropriate packages, prune unnecessary files, and set your machine up for intermittent network connection.

Manual Installation

Before you install the Solaris software manually, consider the following:

- Because most notebook computers only have 640x480 resolution screens, you probably won't want to run OpenWindows during the installation. When the system asks what type of installation you want to do, instead of selecting the `Interactive` or `Custom JumpStart` options, type:

  ```
  bsh
  setprop boot-args "w"
  run kernel/unix
  ```

- For partitioning and package selection recommendations, read Chapter 4, "Disk Partitioning," and Chapter 5, "Package Selection." These chapters describe files in the Notebook Supplement diskette that control disk partitioning and package selection.
- The disk preparation and partitioning steps in the `notebook.cfg` script (described in "fdisk Partitioning" on page 18) are irrelevant because you will be partitioning your disk manually.
- You won't need the Solaris slice descriptions or package selections made by the script `notebook.cfg` (described in "Customizing the Default Package Selections" on page 25).
- You need to be familiar with the contents of the `post.cfg` script, which performs steps you need to do manually after installation. The `post.cfg` script:
  - Installs three packages that are included on the Notebook Supplement diskette (described in "The Notebook Supplement Diskette" on page 3). These are: 1) SUNWnsdrv (additional notebook device drivers), 2) SUNWnsprn (pruning scripts), and 3) SUNWnsdis (scripts supporting nomadic operation).

JumpStart Installation

To accept the defaults, do a JumpStart installation:

1. **Make sure the boot/install device is connected and properly configured.**

Note – If you are installing from the network, your notebook must be registered as an install client with the appropriate boot server.

---

2. **Insert the *Notebook Supplement* diskette into your notebook computer and turn on the machine.**

3. **Select the appropriate boot device from the menu of available boot devices.**

4. **When asked what type of installation you want to do, instead of selecting the `Interactive` or `Custom JumpStart` options, type:**

   ```
   bsh
   setprop boot-args “w install”
   run kernel/unix
   ```

   The `bsh` command provides a boot shell that enables you to specify nonstandard booting options; the `setprop` command tells the system that you want to do a JumpStart installation without running OpenWindows; and the `run` command loads the Solaris kernel with the new options.

5. **When asked about the type of keyboard, display, and mouse you are using, provide the appropriate information.**

   The display type that works on almost all notebook computers is:

   ```
   16 Color, 640x480 VGA panning@800x600
   ```

   By selecting 16-color mode, you will avoid problems with the Suspend/Resume feature on most notebooks (some have trouble with this feature when the display is in a 256-color mode). Also, you can use the 640x480 physical screen as a window onto a larger 800x600 virtual screen, which is good for working in a graphical environment.

Package Installation and Pruning

By default, the Notebook Supplement diskette installs a moderate set of packages and then prunes out files and programs that most users don't need.

If you want to override this package selection and pruning, modify the package selection commands and pruning scripts in the profile *before* doing a JumpStart installation and as described in Chapter 5, "Package Selection." If you decide to modify the diskette, be sure to copy it first, as described below.

Backing Up and Modifying the Notebook Supplement Diskette

If you don't want to use the default selections, be sure to copy the *Notebook Supplement* diskette first. Assuming you have a 3.5-inch diskette drive as drive 1, to copy the diskette, do one of the following:

- Copy the diskette with a command such as:

  ```
  dd if=/dev/rfd1 of=/tmp/profiledsk bs=18k count=80
  ```

  You can then make a new diskette with a command like:

  ```
  dd if=/tmp/profiledsk of=/dev/rfd1 bs=18k count=80
  ```

- Copy it on your DOS system with your favorite DOS utilities.

To modify the *Notebook Supplement* diskette, do one of the following:

- Mount it first with a command like:

  ```
  mount -F pcfs /dev/fd1 /mnt
  ```

  Be sure to unmount it after you are through making your changes.

- Modify it on your DOS system with your favorite DOS or Windows editor since this diskette is in DOS format.

- If your notebook computer does not have a docking bay and you want to do a network installation, use the Xircom Pocket Ethernet Adapter III (PE3). This is a moderate-performance Ethernet adapter that can plug into the parallel port on your computer.

  For detailed information on the Trantor and Xircom devices, see Appendix A, "Notebook Device Drivers and Manual Pages."

Refer to Appendix B, "Notebook Computer Reference Pages," to see if there are any known problems with the notebook and boot/install device you plan to use.

See also *x86: Installing Solaris Software* for general information on CD-ROM and network installations.

Preinstallation Considerations

Using the *Notebook Supplement* diskette, you can do a JumpStart installation or a manual installation. With a JumpStart installation, you can either accept default selections or customize these selections by editing a profile (a text file used as a template by the custom JumpStart installation). To do a manual installation, you must be willing and able to perform several customizations.

The Solaris 2.4 installation process is described in *x86: Installing Solaris Software*.

Disk Partitioning

By default, the Notebook Supplement diskette will preserve any existing DOS partition and use the remainder of the disk for a single Solaris file system.

To partition your disk differently, change the partitioning commands in the profile *before* doing a JumpStart installation and as described in Chapter 4, "Disk Partitioning." Before modifying the diskette, be sure to copy it first, as described in "Backing Up and Modifying the Notebook Supplement Diskette" on page 11.

If you plan to use both Solaris and DOS/Windows on the same machine, read Chapter 9, "Solaris With DOS/Windows."

Installation and Configuration

3

This chapter describes the basic procedures for installing and configuring Solaris 2.4 on an x86 notebook computer. The material presented here is fairly general; detailed information is provided in subsequent chapters.

Connecting a Boot/Install Device

You can install Solaris 2.4 either from a CD-ROM or from a network. Because most notebook computers do not come with supported CD-ROM interfaces or network adapters, you must connect a boot/install device (a SCSI or network interface) to your computer before installation.

There are currently three approaches to connecting a boot/install device to an x86 notebook computer:

- If your notebook computer has a docking bay, connect any supported network card or SCSI HBA card into it. The configuration of supported network and SCSI cards is discussed in the *Solaris 2.4 x86 Hardware Compatibility List*.
- If your notebook computer does not have a docking bay and you want to do a CD-ROM installation, use the Trantor T348 MiniSCSI Plus Parallel-to-SCSI host bus adapter. This is a low-performance SCSI HBA that can plug into the parallel port on your computer.

PMI file development is an ongoing activity, and new and updated PMI files are made available through a Solaris Customer Support BBS. For more information, contact SunSoft Customer Support at (310) 348-6070 and ask about how you can get these files electronically.

Installation Devices

This is a problematic area. The Solaris software can be installed from a CD-ROM or a network, but most notebook computers do not come with supported CD-ROM interfaces or network adapters.

If your notebook computer has a docking bay, you can probably connect any supported network card or a SCSI HBA card to it and install the software in a fairly normal fashion. If your notebook does not have a docking bay (or it doesn't work with your cards), you can install either from a CD-ROM using the Trantor T348 MiniSCSI Plus Parallel-to-SCSI HBA or over the network using a Xircom Pocket Ethernet Adapter III (PE3). These drivers are included in this supplement for your convenience; see Appendix A, "Notebook Device Drivers and Manual Pages."

Pointing Devices

Many notebooks have integrated trackballs (or thumb-buttons) or detachable "quickport" mice. Solaris 2.4 supports Microsoft, Mouse Systems, and Logitech compatible pointing devices connected to serial ports, and PS/2-compatible pointing devices connected to a keyboard mouse port.

Most integrated trackballs are compatible with a Microsoft® mouse on a serial port or with a PS/2® mouse on a PS/2 keyboard mouse port. The QuickPort mouse on the Texas Instruments 4000E is the only known exception, and the Solaris Notebook Supplement includes a driver for this device.

PCMCIA Slots

Solaris 2.4 does not support PCMCIA devices, which more and more notebook computers have. Until Solaris supports these, you cannot use PCMCIA modems, network cards, flash RAM cards, or disks with it. PCMCIA support for a few basic cards should become available in a future Solaris 2.4 x86 Driver Update release. For details, contact SunSoft Customer Support at (310) 348-6070.

Realistically 180 Mbytes of space is considered the minimum amount required to run Solaris. Most high-end notebook computers today come with 200-Mbyte drives, and if you want to carry a lot of applications and data files around with you, it is possible to get a notebook with a 320-Mbyte or larger disk.

Note also that if you choose to maintain a DOS partition on your notebook computer, you need to allocate space for it. If you want to use DOS for maintenance purposes and utilities, allocate about 5-10 Mbytes of space for the DOS partition (this could include hardware setup utilities, COM software, and even some games). If you want to install and run Windows in the DOS partition, you need to allocate an additional 20-40 Mbytes, plus whatever is needed for the applications and your own data files.

Disk Controllers

Virtually all x86 notebook computers have ISA IDE disk controllers and are supported by Solaris 2.4. Noteworthy exceptions are notebooks in the IBM® ThinkPad® series that use a Micro Channel® IDE controller; Solaris does not currently have a driver for these, but it does support the notebooks in the same series that use an ISA IDE controller.

Graphics Adapters

Virtually all x86 notebooks have 640x480 LCD screens, and many can use external monitors. There are about a dozen chips that are used in notebook computer graphics adapters. A few of them are Super VGA chips, but many are only VGAs.

Solaris 2.4 can support any VGA-compatible device in 16-color (or 16 grey-scale) mode, and it provides the capability to pan the 640x480 display within a virtual 800x600 window. This helps offset the small screen size.

Solaris 2.4 also includes Super VGA Protected Mode Interface (SVPMI, or simply PMI) files to properly initialize many notebook graphics adapters in 640x480 mode with 8-bit color, and a few high-end controllers in higher resolution modes for use with external monitors. To use this higher resolution mode, the graphics adapter must have 1 Mbyte of video memory, and there must be a PMI file for that graphics adapter.

Solaris 2.4 can run on 386DX, 486DX, and SL processors, which are machines with hardware floating point, as well as on 486SX and 486SLC processors without hardware floating point. On machines without hardware floating point, the Solaris operating environment performs software emulation for floating-point instructions.

Since Solaris makes relatively little use of floating-point instructions, you shouldn't notice significant performance degradation if your machine doesn't have floating-point hardware. If, however, you expect to run applications that use floating-point operations heavily, you should use a machine with floating-point hardware.

Memory Size

It takes more memory to install a Solaris Notebook than it does to run it. This is because prior to disk partitioning, a RAM disk is used for the writable portions of the `root` file system.

It is possible to install Solaris 2.4 (doing a non-GUI install) and run the OpenWindows environment on a machine that has as little as 12 Mbytes of memory. The recommended minimum memory size, however, is 16 Mbytes or more. Most high-end notebook computers today come with 4 or 8 Mbytes on the motherboard and can accept a 16-Mbyte memory expansion card.

Disk Size

Radically pruned Solaris systems can be installed with as little as 120 Mbytes, but this is highly stripped down and includes virtually no room for user applications and data. A more realistic allocation includes:

- 90-120 Mbytes for the Solaris software
- 20-35 Mbytes for the swap area
- 20-200 Mbytes for user applications and user data

Start with at least 120 Mbytes of space for the Solaris software and the swap area, and then add to that whatever is needed for the applications and your own data files.

Basic Hardware Requirements

2

This chapter describes the types of internal and external components a notebook computer must have to run Solaris 2.4. The requirements and limitations presented here are general; for detailed information about particular notebook computers, see Appendix B, "Notebook Computer Reference Pages."

The components discussed in this chapter are:

- Processor type
- Memory size
- Disk size
- Disk controllers
- Graphics adapters
- Installation devices
- Pointing devices
- PCMCIA slots

Processor Type

The recommended minimal processor speeds for notebook computers are the same as those for desktops—a 386 microprocessor at 33 MHz or a 486 at 25 MHz.

Realmode Device Drivers

The *Notebook Supplement* diskette contains realmode (bootable) drivers for the Xircom Pocket Ethernet Adapter III (PE3) and the Trantor T348 MiniSCSI Plus Parallel-to-SCSI HBA. These drivers can be used to do a network or CD-ROM installation on a notebook computer that does not have a docking bay (and so cannot accept standard network or SCSI cards).

Solaris Notebook Device Drivers (SUNWnsdrv)

The *Notebook Supplement* diskette also includes a package containing Solaris drivers for the Xircom PE3, the Trantor T348, and the QuickPort mouse interface.

Package Pruning Scripts (SUNWnsprn)

The scripts contained in the SUNWnsprn package can be used to remove the seldom-used programs and fonts from the (already reduced list of) recommended packages, freeing up an additional 10-20 Mbytes of disk space.

Scripts That Support Nomadic Operation (SUNWnsdis)

The scripts contained in the SUNWnsdis package enable your system to detect the presence or absence of a network interface each time Solaris boots and to adjust network configuration files automatically either to take advantage of or to avoid the use of network services. This package also contains examples of user configuration scripts to handle nomadic operation more automatically.

How to Get Additional Tools

When you configure your Solaris Notebook for intermittent connection, you are likely to want additional tools, such as scripts to change how your mailbox, calendar, and home directory work when using your notebook as a standalone machine or on the network. There are also scripts that reconcile changes to files or mailboxes whenever your notebook is disconnected from the network. Although the Solaris Notebook Supplement does not include these additional tools, they may be available from public electronic sources. For more information, refer to Appendix C, “Electronic Distribution Information.”

- To install Solaris and get it running:

  1. **See Chapter 3, "Installation and Configuration," and follow the instructions for the type of installation you are doing—either JumpStart (accepting the defaults or customizing some) or manual.**
  2. **Review Chapter 6, "OpenWindows on a Notebook Computer," and run `devconfig` to configure the OpenWindows environment for your machine.**
  3. **After you have Solaris running on your notebook computer and you are ready to start using it, read:**
     - Chapter 7, "Intermittent Connection"
     - Chapter 8, "Power Management and Solaris"

- If you are considering installing both Solaris and DOS/Windows on the same disk, first read:
  - Chapter 4, "Disk Partitioning"
  - Chapter 9, "Solaris With DOS/Windows"

The Notebook Supplement Diskette

This is the Solaris MDB (Multiple Device Boot) diskette that is used to boot and install a notebook computer from a CD-ROM or from a network. It contains configuration files for a JumpStart installation, notebook device drivers, and scripts (contained in the SUNWns* packages) for:

- Adding new device drivers to your system
- Pruning the installed software to fit better on a small disk
- Modifying your system to support nomadic operation

Profiled Installation Scripts

The profiled installation rules (special data files) and scripts enable you to select an installation method that automatically partitions your disk, installs the recommended packages, prunes out excess software, and configures your system for intermittent connection. The scripts include recommendations on which packages to install to fit a usable Solaris system onto a relatively small (200 Mbytes or less) disk.

1

Solaris 2.4 x86 Notebook Supplement Guide

This book provides information and guidelines for:

- Determining if Solaris is capable of running on a particular notebook
- Installing Solaris 2.4 on a notebook computer
- Squeezing Solaris onto a small disk
- Configuring Solaris to run well on an intermittently connected computer
- Using an intermittently connected Solaris Notebook
- Configuring the Solaris Notebook Supplement device drivers

This document contains specific reference pages for most of the leading high-end notebook computers that are known to work with Solaris 2.4, and it includes information on how to configure, install, and use them with Solaris. A list of unsupported notebook computers is also provided.

Because configuring a Solaris Notebook is not yet a turnkey operation, this book contains more technical background information than *x86: Installing Solaris Software* and the *x86 Device Configuration Guide*, supplemental books distributed with Solaris 2.4. Highly technical topics, though, such as how to develop your own PMI files for graphics adapter support, are not within its scope.

Tips on Using This Book

- If you are still trying to decide which notebook computer to use, read Chapter 2, “Basic Hardware Requirements,” and Appendix B, “Notebook Computer Reference Pages.”

- If you already have a supported notebook computer (see Appendix B, “Notebook Computer Reference Pages”) and you are willing to accept the default selections provided by the *Notebook Supplement* diskette, perform an automatic profiled, or *JumpStart*, installation, as described in Chapter 3.

- If you aren’t sure if you should do a JumpStart™ installation, first read:
  - Chapter 4, “Disk Partitioning”
  - Chapter 5, “Package Selection”

Introduction to the Solaris Notebook Supplement

1

Notebook computers have a tremendous potential to change the way we work to improve our productivity. Running a powerful desktop operating system on a notebook computer also creates several challenges, among them using smaller screens and smaller disks. And while a desktop computer can always be connected to a network, a notebook computer is only intermittently connected.

Since Solaris 2.4 is targeted primarily at high-end desktop systems, it is not always easy to install and use on notebook computers. While future releases of Solaris will integrate enhancements to support standalone and intermittently connected, or *nomadic*, notebook computers, there is a need to provide support to users who want to run the Solaris software on their notebook computers now.

The Solaris Notebook Supplement bridges this gap by providing software and documentation so you can install and configure Solaris 2.4 on a notebook computer and use it with or without being on a network.

The Solaris Notebook Supplement consists of:

- *Solaris 2.4 x86 Notebook Supplement Guide* (this document)
- The *Notebook Supplement* diskette

What Typographic Changes Mean

The following table describes the typographic changes used in this book.

Table P-1 Typographic Conventions

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

Shell Prompts in Command Examples

The following table shows the default system prompt and superuser prompt for the C shell, Bourne shell, and Korn shell.

Table P-2 Shell Prompts

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

Chapter 9, "Solaris With DOS/Windows," describes what to consider if you want to install and run both Solaris 2.4 and DOS/Windows on your notebook computer.

Appendix A, "Notebook Device Drivers and Manual Pages," contains manual pages that describe the `pe` driver (for the Xircom® Pocket Ethernet Adapter™ III (PE3)), the `trantor` driver (for the Trantor® T348™ MiniSCSI™ Plus Parallel-to-SCSI host bus adapter), and the `tiqmouse` driver (for the QuickPort™ mouse interface on the Texas Instruments® 4000E notebook computer). Configuration notes for these drivers are also included.

Appendix B, "Notebook Computer Reference Pages,"contains detailed information on how to configure, install, and use most of the leading, high-end notebook computers with Solaris 2.4.

Appendix C, "Electronic Distribution Information," describes how you can obtain the Solaris Notebook Supplement electronically from CompuServe℠, the SunSoft™ BBS, or via Internet File Transfer.

Related Books

Refer to the following Solaris 2.4 documents as necessary while installing and configuring the Solaris Notebook Supplement:
- *Solaris User's Guide* [User Set]
- *Solaris Advanced User's Guide* [User Set]
- *Solaris 2.4 x86 Hardware Compatibility List* [User Set]
- *Solaris 2.4 Open Issues and Late-Breaking News* [User Set]
- *x86 Device Configuration Guide* [User Set]
- *x86: Installing Solaris Software* [User Set]
- *NFS Administration Guide* [System Administrator Set]
- *User Accounts, Printers, and Mail Administration* [System Administrator Set]

Getting Help

If you have problems installing the Solaris Notebook Supplement, call SunSoft Installation Support at (310) 348-6070.

full advantage of the Solaris Notebook Supplement‘s features and increase the usability of your notebook, you must also be able to modify configuration files and login profiles, and edit and write shell scripts.

If you are less technical, you can still use this book to install and run the Solaris Notebook Supplement on your notebook computer. However, you must be willing to accept the default disk partitioning and package selections provided by the *Notebook Supplement* diskette.

How This Book Is Organized

This book consists of nine chapters and three appendixes.

Chapter 1, "Introduction to the Solaris Notebook Supplement," provides an overview of the Solaris Notebook Supplement and its components.

Chapter 2, "Basic Hardware Requirements," provides a general description of the types of components a notebook computer must have to run Solaris 2.4. It also notes specific notebook computers and components that are incompatible with Solaris 2.4.

Chapter 3, "Installation and Configuration," outlines the basic procedures for installing and configuring Solaris 2.4 on a notebook computer.

Chapter 4, "Disk Partitioning," describes what you need to consider when you partition your disk, allocate space to a DOS partition and among Solaris slices, and modify the default partitioning in the *Notebook Supplement* diskette.

Chapter 5, "Package Selection," describes what to consider when selecting packages to install on your notebook computer.

Chapter 6, "OpenWindows on a Notebook Computer," explains how to configure the OpenWindows ™ environment and tailor the system for small screens. It also describes how to use external devices and how to define an alternate OpenWindows configuration.

Chapter 7, "Intermittent Connection," describes steps to take when using a Solaris Notebook in an intermittently connected mode of operation—that is, as both a standalone and networked machine.

Chapter 8, "Power Management and Solaris," defines automatic power management, and describes its features and how the Solaris software interacts with them.

Preface

The *Solaris 2.4 x86 Notebook Supplement Guide* contains configuration requirements and instructions for installing the Solaris™ 2.4 for x86 Supplement for Notebook Computers (Solaris Notebook Supplement) on a notebook computer. The Solaris Notebook Supplement includes this guide and a profiled install diskette (Notebook Supplement diskette). You must have Solaris 2.4 to use this supplement, which enables you to run the Solaris software on your notebook, with or without being connected to a network.

The *Solaris 2.4 x86 Notebook Supplement Guide* also contains:

- Configuration notes and manual pages for drivers included in the Solaris Notebook Supplement
- Configuration and installation information on specific notebook computers that the Solaris Notebook Supplement supports
- Information on how you can obtain the Solaris Notebook Supplement electronically

In this book, the term *Solaris Notebook* refers to a notebook computer with an Intel® 80x86 microprocessor, running Solaris 2.4.

Who Should Use This Book

This book is targeted toward users who have previous experience installing operating system software and new machines, and who are familiar with windowing environments and mouse- and menu-driven applications. To take

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