Note – If you want to redirect the output of a `tar` command (or `dd` or `cpio`) to a PCMCIA memory device, you *must* first create a file system on the card, using the `fdformat` command without arguments. The card will need to be reformatted before it can be written on again.

Hot-Plugging

If a memory card is removed while it's in use, the device driver returns errors until a memory card is inserted into the appropriate socket.

The device needs to be closed and then re-opened with the card reinserted in order to get it working again. If you removed the card while it was in use as a file system, unmount the file system with the `umount` command. Then reinsert the card and remount the file system with the `mount` command.

Similarly, if you interrupt a `tar` or `cpio` process by removing the card, you must stop the process, reinsert the card in the socket, and then restart the process.

Special Files

The special files created for PCMCIA memory cards act like disks and have names in the form of `/dev/dsk/c#t#d#p#` or `/dev/dsk/c#t#d#s#` (see `pcram(7)`). These are described below:

`c#`	controller #
`t#`	card technology type #, defined as follows:
	`0` Null - no device
	`1` ROM
	`2` OTPROM (One Time PROM)
	`3` UV EPROM
	`4` EEPROM
	`5` Flash EPROM
	`6` SRAM
	`7` DRAM
`d#`	device region of type #, usually zero
`p#`	`fdisk` partition #
`s#`	Solaris slice #

Note – A device name can be specified either by a partition name (`p#`) or a slice name (`s#`), but not both.

Using PCMCIA Memory Cards

Since the Solaris Volume Management software recognizes PCMCIA memory cards, no special `vold` configuration is required.

♦ **If you do not want to use `vold` to manage your PCMCIA memory cards, comment out the "`use pcmem`" line in the `/etc/vold.conf` file.**
To comment out a line in `/etc/vold.conf`, add a # character to the beginning of the line.

PCMCIA memory devices don't need to have file systems on them, though typically, before using a new PCMCIA memory card, you will want to create a file system on it. DOS `pcfs` is the best format to use. Although you can use virtually any file system format on a PCMCIA memory card, most other file system formats are platform-dependent, making them unsuitable for moving data between different types of machines. See "Using PCMCIA Memory Cards" in Chapter 1 for an example of how to create a `pcfs` file system on a PCMCIA memory card.

PCMCIA SRAM and DRAM Devices

Description

The `pcram` driver supports a wide range of PCMCIA SRAM (Static RAM) and DRAM (Dynamic RAM) cards. It does not yet support Flash RAM cards.

Device Configuration

Configuring the Device

If a PCMCIA memory card is recognized, the `pcram` device driver is automatically loaded, the physical address is allocated, and the special files are created (if they do not already exist). No manual configuration is necessary or possible.

If you have inserted a memory card and it has not been recognized (no special files created), use the `prtconf` command to help identify the problem.

Identifying an Unrecognized Card

1. **Run the `prtconf` command to see if your memory card is recognized:**

```
# prtconf
```

   If the device is recognized, lines similar to the following will be included in the `prtconf` output:

```
pcmcia, instance #0
    pcmem, instance #0
          pcram, instance #0
```

2. **If your memory card does not appear in the `prtconf` output, it is not supported and cannot be used with the `pcram` device driver.**

Hot-Plugging

If a PCMCIA modem or serial card is unplugged while it's in use, the device driver will return errors until the modem or serial card has been replaced in the socket.

The device needs to be closed and re-opened with the card reinserted in order to get it working again. How this happens depends on the application. For example, a `tip` session automatically exits when a card in use is unplugged. To start using the system again, you must restart the `tip` session.

Warnings

Because manufacturers interpret the PCMCIA specifications in different ways, some devices do not work, or work poorly. Consult the latest *Solaris 2.4 x86 Hardware Compatibility List* for a list of modems that have been tested. See "How to Obtain the Solaris 2.4 x86 Hardware Compatibility List" in the front of this document.

- If the device is not recognized, the `prtconf` output may include lines such as:

```
pcmcia, instance #0
   PC,111.222/Data Masher (driver not attached)
or
pcmcia, instance #0
   pcmem, instance #0
       pcram, instance #0
```

2. **If your device is not recognized as "`(driver not attached)`", use the `add_drv` command to add the name of your device as another known alias for `pcser` devices.**
   Use the identification string listed in the output from `prtconf`. Typically, the part of the identification string following the slash can be treated as a comment, so use the entire string in the add_drv command. For example:

```
# add_drv -i '"PC,111.222"' pcser
or
# add_drv -i '"PC,111.222/Data Masher"' pcser
```

Note – Be sure to include the double quotes in single quotes to keep the shell from stripping out the double quotes. See `add_drv(1M)`.

---

3. **If your device is erroneously recognized as a memory card, determine why this is happening and manually update the `pcic.conf` file.**

Special Files

PCMCIA serial devices are named based on socket number and located in `/dev/term` and `/dev/cua`. A card inserted in socket 0 is `pc0` and socket 1 is `pc1`. See `pcser(7)`.

Additional Software Configuration

When adding a new serial port or modem to the system, you often need to edit configuration files so that applications can use the new communications port. For example, the `/etc/uucp/Devices` file needs to be updated in order to use UUCP and PPP. See "UUCP Databases and Programs" in *TCP/IP Network Administration Guide*.

PCMCIA Modem and Serial Cards

Description

The `pcser` driver supports a wide range of PCMCIA modem and serial cards (based on the 8250, 16550, or compatible UART) at speeds up to 115 Kbps.

Device Configuration

Configuring the Device

If a PCMCIA modem or serial card is recognized, the `pcser` device driver is automatically loaded, ports and IRQs are automatically allocated, and the special files are automatically created (if they do not already exist). No manual device configuration is necessary or possible.

If you have inserted a PCMCIA modem or serial card and it has not been recognized (no special files created), use the `prtconf` command to help identify the problem.

Identifying an Unrecognized Card

1. **Run the `prtconf` command to see if your modem or serial card is recognized:**

```
# prtconf
```

   - If the device is recognized, the `prtconf` output will include lines similar to the following:

```
pcmcia, instance #0
   pcser, instance #0
```

2. **If `pcelx` does not appear in the `prtconf` output, there is a problem with the PCMCIA controller configuration or with the hardware. Check to see whether the problem is with the card or the controller by trying to use the card on another machine and by seeing if it works on the same machine using DOS.**

Special Files

Device naming in `/dev` follows standard LAN device naming except that the PPA unit number is the socket where the card resides, not the instance. That is, for the `pcelx` driver, `/dev/pcelx0` (or PPA 0 of `/dev/pcelx`) is the card in socket 0, while a card in socket 1 is `/dev/pcelx1` (or PPA 1 of `/dev/pcelx`). See `pcelx(7)`.

Additional Software Configuration

Because the PCMCIA Ethernet card is not yet supported during the installation of the Solaris operating system, a number of network configuration files must be updated before it can be used as a network interface. See "Adding a PCMCIA Network Card" in Chapter 1 for instructions.

Hot -Plugging

If you remove the card, any information you send is discarded, but no error messages are issued.

The 3Com EtherLink III PCMCIA Ethernet card can only be used in one socket and will not work if removed and plugged into another socket. This problem can be avoided by always plugging in your PCMCIA Ethernet card into socket 0. If you want to reinsert the card, insert it into the same socket you used before; that is, socket 0. This is documented as bug 1188733.

PCMCIA 3Com EtherLink III (3C589) Card

Description

The 3Com 3C589 EtherLink III adapter is a Type-II (5 mm) PCMCIA Ethernet card.

Device Configuration

Preparing for Configuration

At this time, it is not possible to boot or install the Solaris system using a PCMCIA 3Com EtherLink III card.

Configuring the Device

If the 3Com PCMCIA card is recognized, the `pcelx` driver will be automatically loaded, ports and IRQs will be automatically allocated, and the special files will be automatically created (if they don't already exist). No manual configuration is necessary or possible.

If you have inserted a 3Com PCMCIA card and it has not been recognized (no special files created), you can use the `prtconf` command to help identify the problem.

Identifying an Unrecognized Card

1. **Run the** `prtconf` **command to see if your 3Com 3C589 card is recognized:**

```
# prtconf
```

   If the device is recognized, lines similar to the following will be included in the `prtconf` output:

```
pcmcia, instance #0
   pcelx, instance #0
```

1. **To override the default IRQ level for the** `pcic` **driver, edit the** `/kernel/drv/pcic.conf` **file and add a line that contains '**`smi=`**'. (Be sure to add this line before the** `;` **character in the file.)**
   Example: To change to IRQ 9, add the following line to `pcic.conf`:

```
smi=9
```

2. **Reboot the system.**

```
# reboot
```

Note – In the "Changing the Default IRQ" example, a resource is being made available to the PCMCIA devices. In the "Correcting Possible Conflicts" examples, the `#exclude:` lines identify resources that are *unavailable* to PCMCIA devices.

---

d. **For `res-irq` lines, the following field should be a decimal IRQ number.**
Example: If a notebook computer uses IRQ 15 for Power Management, you can exclude IRQ 15 by adding the following line:

```
#exclude:pm res-irq 15
```

The PCMCIA software would then know that IRQ 15 is not available for use by PCMCIA devices.

e. **For `res-memory` and `res-ioaddr` lines, the next two fields should be a hexadecimal base and byte count. The leading `0x` should not be included.**
For example, if the Solaris `smc` Ethernet device driver does not identify allocated resources automatically, add the following lines to the `pcic.conf` file:

```
#exclude:smc res-irq 3
#exclude:smc res-ioaddr 280 10
#exclude:smc res-memory dc000 2000
```

The `#exclude:` lines identify IRQ 3, ports `0x280-28F`, and addresses `0xDC000-0xDDFFF` as unavailable for PCMCIA device use.

2. **Reboot the system.**

```
# reboot
```

Changing the Default IRQ

There is one optional property that may be defined in the `/kernel/drv/pcic.conf` file. If specified, the `smi` property overrides the default IRQ level used by the `pcic` driver itself. By default, the second to the last IRQ in the `res-irq` list is used. If that value is unusable, or if you prefer another value, specify the IRQ level using the `smi` property.

`res-ioaddr` This property, like the `res-memory` property, is a list of base address and length pairs. The length is in bytes, and the base address refers to I/O space. For example, if 32 bytes of I/O space are available at `0x200`, and 16 bytes are available at `0x300`, the property is listed as:

```
res-ioaddr=0x200,0x32,0x300,0x16
```

If the available resources recorded by the PCMCIA software in the `/kernel/drv/pcic.conf` file includes resources that are actually in use by other devices in the system, you must manually edit the file to remove them. See "Correcting Possible Conflicts" below.

Note – Anytime you modify the `pcic.conf` file, you must reboot the system for the changes to take effect.

Correcting Possible Conflicts

When the PCMCIA software cannot automatically determine which resources are available, information must be added manually to the `/kernel/drv/pcic.conf` file to identify the unavailable resources. The resources available for PCMCIA devices are defined by three properties, which are described above.

1. **To include information about unavailable resources, edit the** `/kernel/drv/pcic.conf` **file and add** `#exclude:` **lines.**

   a. **Each line that describes a set of reserved resources must begin with** `#exclude:`.

   b. **Non-blank characters after the colon are treated as a comment and ignored.**
   For example, the string "`pm`" in the example below shows that you are disabling IRQ 15 because of a conflict with the Power Management resource.

   c. **The next field should specify the** `res-irq`, `res-memory`, **or** `res-ioaddr` **property.**
   See `pcic(7)`.

PCMCIA Resource Configuration Information

In most cases, the available resources will be determined automatically and recorded in the file `/kernel/drv/pcic.conf`. For proper operation, this information must be accurate. If not, ports, memory addresses, or IRQs that are in use by other devices will be allocated to PCMCIA devices. This can cause unpredictable and serious consequences.

The resources available for PCMCIA devices are defined by three properties in the `pcic.conf` file:

`res-irq`

This property is a complete list of the IRQ levels available for use by the `pcic` driver. For example, if IRQ levels 3, 9, and 15 are available, they are listed as:

```
res-irq=3,9,15
```

Each PCMCIA I/O card that needs an interrupt is assigned a different IRQ level. In addition, the PCMCIA controller itself uses one IRQ level. In this example, only two PCMCIA I/O cards can be used simultaneously.

`res-memory`

This property is a list of memory base and length pairs. The length is in number of 4-Kbyte pages available. For example, if there are two blocks of memory available, one starting at `0xcc000` with 8 pages available, and another at `0xd0000` with 4 pages available, the property is set up as:

```
res-memory=0xcc000,0x8,0xd0000,0x4
```

Many notebook computers have all the memory between `0xcc000` and `0xeffff` available. This would be listed as:

```
res-memory=0xcc000,0x14
```

If the notebook computer is to be used in a docking bay, be sure that the configuration also accounts for any devices installed in it.

- If your system has a supported PCMCIA controller configured at a known address, it should be recognized automatically. No manual configuration should be necessary.

Configuration of PCMCIA Cards

The Solaris PCMCIA nexus driver automatically allocates address space, I/O ports, and IRQs to new cards when they are inserted. To do this, the nexus driver must have sufficient free resources and recognize what resources are already used by other drivers.

- During installation of the PCMCIA Driver Update software, a system initialization script maps out the resources used by all the other devices in the system. Resources not known to be used by another driver are assumed free for use by PCMCIA drivers.

Note – If you are using a notebook with a docking bay, keep the notebook in the docking bay during the installation of the PCMCIA Driver Update software. This ensures that the system can identify the resources used by cards in the docking bay.

- Reconfiguration usually works automatically, but some machines may require that you provide information about resources already allocated. Three cases have been encountered:
  - *Case 1:* Some device drivers do not export properties describing the resources they use, so an automatic scan cannot determine what resources are allocated to those drivers. This situation is detected automatically by the scan, and the script prints out a warning message and request for manual assistance. See “Correcting Possible Conflicts” later in this Device Reference Page.
  - *Case 2:* Some machines may have devices for which no Solaris driver exists, and this can’t be detected automatically. You will have to enter the descriptions of their resource requirements manually.
  - *Case 3:* Some machines may have reserved additional ports, memory, or IRQs that are not detected by the automatic scan. In cases like these, the PCMCIA software may appear to configure properly, but some PCMCIA devices may simply not work (because they are sharing resources with other hardware). For example, some notebooks reserve an IRQ for power management use. In cases such as this, read through the hardware documentation that accompanies the machine.

PCMCIA Controllers

Description

The Solaris `pcic` driver supports PCMCIA controllers based on the Intel® 82365SL and the Cirrus Logic PD6710/PD6720 chips. There is support for up to eight sockets (Type I, II, or III).

Other controllers that use chips based on the Intel 82365SL design may also be supported. At the time of this Driver Update, controllers based on the following chips have also been tested: Vadem VG365/VG465/VG468/VG469, Ricoh RF5C366, and Toshiba. Most systems using one of these chips should work. The latest version of *Solaris 2.4 x86 Hardware Compatibility List* includes a list of systems that have been tested. (See “How to Obtain the Solaris 2.4 x86 Hardware Compatibility List” in the front of this document.)

Device Configuration

Preparing for Configuration

Resource requirements for a system depend on the combination of devices to be used. A typical two-socket notebook computer needs at least 8 Kbytes of address space, 16 bytes of I/O space, and three free IRQs. The following are general guidelines:

Address space	At least 8 Kbytes are required with 4 Kbytes per socket in the 640K-1Mb range (not necessarily contiguous); if you have three sockets, at least 12 Kbytes are needed.
I/O space	At least 8 and preferably 16 bytes per socket.
IRQs	At least one per socket, plus an additional IRQ for the `pcic` device driver, itself.

Controller Configuration

- If you have an add-on PCMCIA controller, install it on your system prior to installing the PCMCIA Driver Update software.
- Some notebook computers have their built-in PCMCIA controller disabled by default. Enable it prior to installing the Solaris PCMCIA Driver Update.

Device Reference Pages A

This appendix supplements Appendix B, "Device Reference Pages," in the *x86 Device Configuration Guide*. It includes necessary device configuration information for hardware supported by the new or updated drivers.

Use the following table to locate information about your hardware and proceed directly to those pages.

PCMCIA Hardware	**Solaris Driver**	
PCMCIA Controllers	`pcic`	*page 15*
PCMCIA 3Com EtherLink III (3C589) Card	`pcelx`	*page 21*
PCMCIA Modem and Serial Cards	`pcser`	*page 23*
PCMCIA SRAM and DRAM Devices	`pcram`	*page 26*

If a PCMCIA card is recognized as present when the card is in the socket before the system is booted, but is not recognized as present when the card is hot-plugged, do the following:

- If you have an AST PowerExec notebook computer:
  - Remove IRQ 15 from the list of usable interrupts.
  - Define the `smi` property to be 9.

  See "PCMCIA Resource Configuration Information" in the Device Reference Page for "PCMCIA Controllers" in Appendix A for instructions.

- If your notebook computer is not an AST PowerExec, try overriding the default interrupt by using the `smi` property as described in "PCMCIA Controllers" in Appendix A. If that does not work, try several different IRQ levels.

If a PCMCIA card is not identified when inserted prior to booting the system, do the following:

- Make sure that the I/O, memory, and interrupt resources listed in the `/kernel/drv/pcic.conf` file are correct.These properties are described in the "PCMCIA Controllers" Device Reference Page under "PCMCIA Resource Configuration Information." If the information there is accurate, contact SunSoft Customer Support at 1-800-SUNSOFT.

The Intergraph TD-30 and TD-40 machines exhibit PCMCIA memory conflicts which can be corrected by adding one set of the following two lines to the `/kernel/drv/picic.conf` file and then rebooting the system.

```
#exclude:td30 res-memory c0000 10000
#exclude:td30 res-memory d0000 40000
or
#exclude:td40 res-memory c0000 10000
#exclude:td40 res-memory d0000 40000
```

Known Problems

- **(1188733)** On some systems, a 3Com EtherLink III PCMCIA Ethernet card can only be used in one socket and will not work if removed and plugged into another socket. This problem can be avoided by always plugging in your PCMCIA Ethernet card into socket 0. If you want to reinsert the card, insert it into the same socket you used before; that is, socket 0.

Warning – The following problem has occurred on PCMCIA machines using the Vadem VG469 PCMCIA controller chip. To avoid this problem, ground yourself by touching some metal on the computer case while inserting and removing the PCMCIA cards.

- Sometimes the PCMCIA controller will cause the machine to lock up. The `prtconf` command output may indicate that the device is in two sockets after a card is inserted in one socket. Subsequent card insertions and removals may not be detected, and the machine locks up.

  The machine must then be reset or powercycled.

Troubleshooting PCMCIA Device Configuration

When a PCMCIA device doesn't work, you must isolate the problem.

First, determine that the nexus and adapter drivers have loaded successfully:

- Use the `prtconf` command to see if the device nodes for both `pcic` and `pcmcia` exist.
  - If they do, the software has loaded and successfully identified a PCMCIA controller. Any card that is inserted should be identified as an entry under the `pcmcia` node. If it is a supported card, then it should be usable when inserted and the `prtconf` output identifies the card. It should not say "`(driver not attached)`" or be falsely identified as a `pcmem` card. See "Identifying Unrecognized Cards" earlier in this chapter.
  - If neither device driver is recognized, your system does not have a supported PCMCIA controller.

5. **Use the `mount` command to mount the device.**
   For example, to mount the `pcfs` file system created in the previous step, on to the mount point `/mnt`, type:

```
# /etc/mount -F pcfs /dev/dsk/c1t6d0s2 /mnt
```

Using the Volume Management Software to Manage PCMCIA Memory Cards

Since the Solaris Volume Management software recognizes PCMCIA memory cards, no special `vold` configuration is required.

1. **Become root.**

2. **Use the `fdformat` command to create a `pcfs` file system on the PCMCIA memory card. See `fdformat(1M)`.**
   For example, a DOS `pcfs` file system can be created on a PCMCIA memory card in socket 0 by typing:

```
# fdformat -t dos /vol/dev/aliases/pcmem0
```

3. **After formatting is complete, Volume Manager will automatically mount the device only *after* the card is physically removed and reinserted. To check this, run the `mount` command after reinserting the card.**

Note – If you want to redirect the output of a `tar` command (or `dd` or `cpio`) to a PCMCIA memory device, you *must* first create a file system on the card, using the `fdformat` command without arguments. The card will need to be reformatted before it can be written on again.

The method for creating a file system is different depending on whether or not the Solaris Volume Management software is used. Both methods are described below.

Using PCMCIA Cards Without Volume Manager

1. **Become root.**
2. **If you do not want to use `vold` to manage your PCMCIA memory cards, comment out the `use pcmem` line in the `/etc/vold.conf` file.**
   To comment out a line in `/etc/vold.conf`, add a # character to the beginning of the line using a text editor. The line would then look similar to the following:

```
# use pcmem drive /dev/rdsk/c*s2 dev_pcmem.so pcmem%d forceload=true
```

3. **Stop and restart Volume Manager so the change will take effect.**

```
# /etc/init.d/volmgt stop
# /etc/init.d/volmgt start
```

4. **Use the `fdformat` command to create a `pcfs` file system on the PCMCIA memory card.**

Note – `fdformat` will destroy all existing data on the memory card.

Device naming for PCMCIA memory cards is discussed in `pcram(7)`, `fdformat(1)`, and "PCMCIA SRAM and DRAM Devices" in Appendix A, "Device Reference Pages."

For example, a DOS `pcfs` file system can be created on a PCMCIA memory card in socket 0 by typing:

```
# fdformat -t dos /dev/dsk/c1t6d0s2
```

PCMCIA Release Notes

Adding a PCMCIA Network Card

Typically, a network interface is configured when Solaris is first installed on the system. However, because the `pcmem` PCMCIA Ethernet device driver does not support network booting and installation, you must update several network configuration files and enable the network interface before the card can be used.

To use a 3Com 3C589 PCMCIA card, you must update several network configuration files:

1. **Create a** `/etc/hostname.pcelx#` **file (where** `#` **is a socket number) to specify the host name associated with this interface.**
2. **Add an IP address for the new host name to the file** `/etc/inet/hosts`**.**
3. **Ensure that the associated network is listed in** `/etc/inet/netmasks`**.**
4. **Ensure that the Name Service Switch** `/etc/nsswitch.conf` **configuration file includes the network and local services you need.**
5. **Reboot the system.**

Note – This process is described in *TCP/IP Network Administration Guide*.

Using PCMCIA Memory Cards

PCMCIA memory cards can be used like diskettes. They can be used to store data, or they can have file systems containing files and directories.

PCMCIA memory devices don't need to have file systems on them, though typically, before using a new PCMCIA memory card, you will want to create a file system on it. DOS `pcfs` is a good format to use. Although you can use virtually any file system format on a PCMCIA memory card, most other file system formats are platform-dependent, making them unsuitable for moving data between different types of machines.

4. **Remove the diskette from drive 0.**

5. **Clean up the temporary workspace.**

```
# cd /
# rm -fr /tmp/Drivers
```

6. **Perform a reconfiguration boot to enable the new PCMCIA support.**

```
# touch /reconfigure
# reboot
```

I/O ports, IRQs, and memory addresses available for use by PCMCIA devices should be configured automatically. For information about manual configuration of PCMCIA devices, see "PCMCIA Controllers" in Appendix A, "Device Reference Pages."

If you insert a PCMCIA device into your system, it should be automatically recognized and configured. For more information, see the "Hot-Plugging" sections on the individual PCMCIA Device Reference Pages in Appendix A.

If you have a 3Com PCMCIA Ethernet card, follow the additional installation instructions in the next section to enable the new network interface.

Note – Reconfigure boots or use of the `drvconfig` command should not be necessary with PCMCIA devices. Any use of these features will cause the `/kernel/drv/pcic.conf` file to be overwritten, so changes to the `smi` property will be lost (`#exclude:` lines will remain intact). These features should only be used when non-PCMCIA devices are added or removed.

Installing the PCMCIA Driver Update

Note – Before installing this PCMCIA Driver Update, read the information in the PCMCIA Device Reference Pages in Appendix A. Also be sure that you have filled out the Device Configuration Worksheet and check that all hardware resources for your system are accounted for. Then if you have trouble with identifying PCMCIA devices, you can consult the worksheet to see what possible device conflicts exist.

The contents of the "Solaris 2.4 x86 Driver Update 8 Distribution (PCMCIA)" diskette is installed as a combination of patches and packages on your Solaris 2.4 x86 system. To install the PCMCIA Driver Update, you must already have Solaris 2.4 and Solaris 2.4 x86 Driver Update 8 installed and running on your x86 system.

Note – If you have an add-on PCMCIA controller, be sure to install it before installing the PCMCIA Driver Update.

Note – If you are using a notebook computer with a docking bay, be sure the notebook is in the docking bay before you install the PCMCIA Driver Update. This is necessary so that the system can identify the resources used by cards in the docking bay.

1. **Insert the "Solaris 2.4 x86 Driver Update 8 Distribution (PCMCIA)" diskette into drive 0.**

2. **Become root.**

3. **Use `cpio` to copy files off the diskette, and run the installation script.**
   The following commands assume the Solaris Volume Management software is running on your system. If it isn't, `volcheck` should *not* be run, and the device name of the diskette drive must be replaced with `/dev/diskette0`.

To see if Volume Management software is running, type: `ps -e | fgrep vold`. For more information about managing diskettes and drives, see *Solaris 2.4 Open Issues and Late-Breaking News*.

```
# mkdir /tmp/Drivers
# cd /tmp/Drivers
# volcheck &
# cpio -iduBI /vol/dev/aliases/floppy0
# ./installdu.sh
```

Cards are not recognized because they don't implement the full Card Information Structure (CIS) or there is a memory conflict.

- If you see "(`driver not attached`)", you can add a new alias to `/etc/driver_aliases` by following the instructions in "PCMCIA Modem and Serial Cards" in Appendix A, only *if* the "model" property is also defined.
- If you see an erroneous `pcmem` entry appear, follow the instructions under "Correcting Possible Conflicts" in the "PCMCIA Controllers" Device Reference Page in Appendix A, or see "Troubleshooting PCMCIA Device Configuration" later in this chapter.

Removing Cards

PCMCIA cards can be removed at any time. The framework notifies the PCMCIA device driver that the card has been removed. Each driver will then deal with the unplugged card in its own way. See "PCMCIA 3Com EtherLink III (3C589) Card," "PCMCIA Modem and Serial Cards," and "PCMCIA SRAM and DRAM Devices" in Appendix A, "Device Reference Pages."

The name of the /dev entry is often based upon the name of the device driver and usually encodes the socket number where the card was inserted. For example, the entry for the 3Com 3C589 inserted in socket 0 will be /dev/pcelx0. The Device Reference Pages in Appendix A and the PCMCIA driver manual pages describe the /dev entries for each device driver.

Recognizing Cards

PCMCIA cards are "recognized" when they are inserted and the appropriate devices and /dev entries are created. If you are not sure if your card has been recognized, perform the following checks:

- Use the prtconf command to see that the pcmcia, pcic, and the name of the driver that supports the card you inserted appear in the output.
- Check to see that the/devices/pcmcia directory includes devices in one of these forms: driver@socket or driver@socket:driver. Since these are specific to each device driver, consult the Device Reference Pages in Appendix A.
- Check that the /dev directory includes the pcmcia device entry. Entries for the network device are also under /dev. Other entries appear in subdirectories of /dev; see the Device Reference Pages in Appendix A for each driver.

Identifying Unrecognized Cards

PCMCIA cards are "unrecognized" if the prtconf command doesn't show a correct entry for the device and if /devices and /dev entries don't exist. Two symptoms you might see for an unrecognized card are:

- An entry is listed under pcmcia in the prtconf output that is not a device driver name and says "(driver not attached)."
- An erroneous pcmem device is detected when the card inserted is a non-memory card.

Configuring PCMCIA Devices

The PCMCIA software should automatically recognize any supported PCMCIA card when it is plugged in and then load the appropriate device driver. If you have a device that is compatible with a supported device, but it is not included in the supported devices database, `/etc/driver_aliases`, you can manually add your new card to the list.

Mostly, this process is applicable to modem cards and is described in "Identifying an Unrecognized Card" in the "PCMCIA Modem and Serial Cards" Device Reference Page in Appendix A. You may also have to define aliases for a small percentage of SRAM cards that have "Attribute Memory."

Configuring the PCMCIA Controller

While PCMCIA devices are autoconfigured, it may be necessary to perform some configuration for the PCMCIA controller itself. The `pcmcia` nexus driver must know which resources are already allocated in order to assign IRQs and ports to PCMCIA devices. During the installation process, a script attempts to automatically determine which resources are already allocated on the system. Some systems may require that resource allocation information be provided manually. See "PCMCIA Controllers" in Appendix A.

Hot-Plugging PCMCIA Cards

Hot-plugging a PCMCIA card means that a PC card can be inserted or removed at any time, even while the machine is powered on and the Solaris software is running. Since this isn't the usual procedure for adding and removing devices, the following sections explain hot-plugging procedures.

Inserting Cards

PCMCIA cards can be inserted at any time into any empty PCMCIA socket. If there is driver support for the card, the card is recognized and a device node is created. When the `/usr/lib/pcmciad` daemon is running (which is by default), the driver is also loaded and the `/dev` entries for the device are created as appropriate.

Understanding PCMCIA Hardware

A PCMCIA controller may be built into your computer (as on most notebook computers) or it may be an add-on card. Most have either one or two sockets, and the PCMCIA controller is, itself, a device on another bus (usually ISA). The PCMCIA controller controls the PCMCIA bus and maps PCMCIA devices onto the main bus (for example, ISA).

The PCMCIA bus was originally developed for memory cards and notebook computers. It is now used for a wide variety of devices (including modems, network interfaces, disk drives, SCSI HBAs, sound cards, and graphics adapters) on machines of all sizes and architectures.

In the Solaris operating environment, sockets are numbered, starting with zero. However, whether they are numbered top-to-bottom or bottom-to-top is platform-dependent. Though sometimes they are marked as "1/2" or "A/B," usually sockets are not marked. To find out how sockets are numbered, either consult your platform documentation or insert a card and see which device got created.

Three types of PCMCIA device are supported by Solaris device drivers. They are about the size of credit cards, but have different thicknesses:

- Type I: 3.3 mm
- Type II: 5 mm
- Type III: 10.5 mm

Lower type cards can be used in higher type sockets. For example, a controller with Type-III PCMCIA sockets should be able to support Type-III, Type-II, and Type-I cards. But a controller with Type-I sockets will only support Type-I devices.

PCMCIA devices are autoconfigured; that is, I/O ports and IRQs are assigned automatically by the Solaris system when each device is plugged in.

PCMCIA devices are hot-pluggable—they can be safely inserted and removed while a machine is running.

Table 1-1 PCMCIA Drivers Supported in This Driver Update

PCMCIA Drivers	
pcic	Intel i82365SL PC Interface Controller driver that supports controllers based on the following chips: Intel 82365SL, Vadem VG365/VG465/VG468/VG469, Cirrus Logic PD6710/PD6720, Ricoh RF5C366, and Toshiba
pcelx	3Com EtherLink III (3C589) PCMCIA Ethernet driver
pcram	PCMCIA memory card driver that supports PCMCIA SRAM and DRAM cards
pcser	PCMCIA serial card device driver that supports PCMCIA modem and serial cards based on the 16550 UART and its variants

Appendix A contains device pages that explain the configuration for each of the types of PCMCIA devices listed above.

The PCMCIA Driver Update also includes `pcmcia`, the PCMCIA nexus driver that provides card and socket services for PCMCIA device drivers (such as `pcic)`; `pcmem`, the PCMCIA memory card nexus driver that supports PCMCIA memory card client drivers (such as `pcram`); and `pcmciad`, the PCMCIA user daemon that provides user-level services for `pcmcia` and PCMCIA card client drivers. See `pcmcia(4)`, `pcmem(7)`, and `pcmciad(1M)`.

Other manual pages have been updated for PCMCIA support and will be installed in the appropriate manual page directory. See `fdformat(1)`, `add_drv(1M)`, `drvconfig(1M)`, `dkio(7)`, and `pcfs(7)`.

For a complete list of the contents of the PCMCIA Driver Update diskette, see the `README` files that are installed in the patch directories `/var/sadm/patch/`<*patch number*>, where <*patch number*> is one of the following for Solaris 2.4 x86 Driver Update 8 PCMCIA: `101908-05`, `101924-02`, and `101938-01`.

Solaris 2.4 x86 Driver Update 8 PCMCIA Support

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A description of the contents of the PCMCIA support included in this Driver Update is followed by a brief overview of PCMCIA hardware, installation instructions, release notes, and troubleshooting information. Appendix A, “Device Reference Pages,” provides additional information about the PCMCIA device configuration in this release.

Read through the entire chapter once before installing the PCMCIA support in Solaris 2.4 x86 Driver Update 8.

PCMCIA Driver Update Contents

Solaris 2.4 x86 Driver Update 8 contains one diskette labeled: “Solaris 2.4 x86 Driver Update 8 Distribution (PCMCIA).” The PCMCIA Driver Update Distribution diskette is intended to be used on Solaris 2.4 x86 systems only. The PCMCIA Driver Update Distribution diskette contains the drivers listed in Table 1-1. A new Section 7 manual page for each of the drivers will also be installed in the appropriate manual page directory during installation.

Note – Support for a specific controller (adapter) chip does not guarantee that PCMCIA support will work on a platform, though it will increase the likelihood. Check the *Solaris 2.4 Hardware Compatibility List* to be certain.

How to Obtain Technical Support

To obtain technical support in North America, customers should call 1-800-SUNSOFT and choose option 4. Outside North America, contact your local Support provider.

How to Obtain the Solaris 2.4 x86 Hardware Compatibility List

The Solaris 2.4 x86 Hardware Compatibility List is updated monthly and is available from the following sources:

- email
  - ASCII version—Send electronic mail to `x86hcl@Sun.COM`.
  - PostScript™ version—Send electronic mail to `x86hcl.ps@Sun.COM`.
- CompuServe—Type '**`go sunsoft`**' and go to the Solaris x86 library.
- The WWW (`http://access1.Sun.COM`)—Click on "SunSoft's Support Resolutions Answer Center," select "Solaris," and then click on "x86 Hardware Compatibility List."
- ASK-IT—SunSoft's Automated Support Fax-on-Demand Service
  - In North America, call 1-800-SUNSOFT, and use prompts 4, 1, 1, respectively. You can also call (310) 348-6219 and choose option 1.
  - In locations other than North America, use the following numbers to request this document:

Singapore	65-733-3405
Taiwan	886-2-719-8069
Japan	03-5717-2560
United Kingdom	44-1494-510981

How to Obtain Driver Updates

This Driver Update is posted on:

- CompuServe—Type '**`go sunsoft`**' and go to the Solaris x86 library.
- FTP—Use anonymous FTP to access:
  - `ftp.uu.net`, then go to `/vendor/sun/sun-doc/x-86-driver/2.4`
  - `sunsite.unc.edu`, then go to `/pub/sun-info/solaris-x86/sunsoft-drivers`
- WWW
  - Open URL `http://access1.Sun.COM` and click on "SunSoft's Support Resolutions Answer Center," select "Solaris," and then click on "x86 Driver Information."
  - Open URL `http://sunsite.unc.edu/pub/sun-info/solaris-x86/sunsoft-drivers`

How This Book Is Organized

A brief description of the contents of the PCMCIA functionality diskette is followed by installation instructions for the new drivers, and detailed configuration instructions for the hardware devices that are supported by the new drivers.

Note – Even though the instructions for installing the new drivers are presented first, read and follow the appropriate hardware configuration instructions in Appendix A, "Device Reference Pages," before installing the new drivers. The hardware must be configured properly for the Solaris software to install and run correctly.

Chapter 1, "Solaris 2.4 x86 Driver Update 8 PCMCIA Support " provides information about what is new in this release and how to install it.

Appendix A, "Device Reference Pages," provides device configuration information for PCMCIA devices. This appendix should be read and the hardware configured *prior* to installing the Driver Update software.

Related Books

You may need to refer to the following books when installing the Driver Update:

- *x86 Device Configuration Guide*
  Describes how to configure x86 devices before installing Solaris software.
- *x86: Installing Solaris Software*
  Describes how to install the Solaris software on x86 systems.
- *Solaris 2.4 Open Issues and Late-Breaking News*
  Describes late-breaking news about running Solaris software, including known problems with supported hardware or device drivers.
- *Solaris 2.4 x86 Hardware Compatibility List*
  Contains a list of supported hardware on Solaris 2.4 x86 systems.

About This Book

This document provides information about PCMCIA device functionality now supported on the Solaris™ 2.4 computing environment. You can use the PCMCIA diskette with Driver Update 8 to update your installed Solaris 2.4 system PCMCIA drivers.

Information regarding the availability of new drivers can be obtained by calling SunSoft's Automated Support System at 1-800-SUNSOFT (options 4,1,1) or by sending electronic mail to `support@cypress.West.Sun.COM`.

Before You Read This Book

This document contains additional device configuration information for newly supported hardware. The importance of properly configured hardware prior to installing Solaris is discussed in the *x86 Device Configuration Guide*. This document assumes you have fully read and understood that guide; Appendix A, "Device Reference Pages," in this document is an addendum to that guide. Likewise, the installation instructions for this PCMCIA Driver Update are very brief and serve only to supplement the instructions found in *x86: Installing Solaris Software*.

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Solaris™ 2.4
x86 PCMCIA Driver Update 8 Guide

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