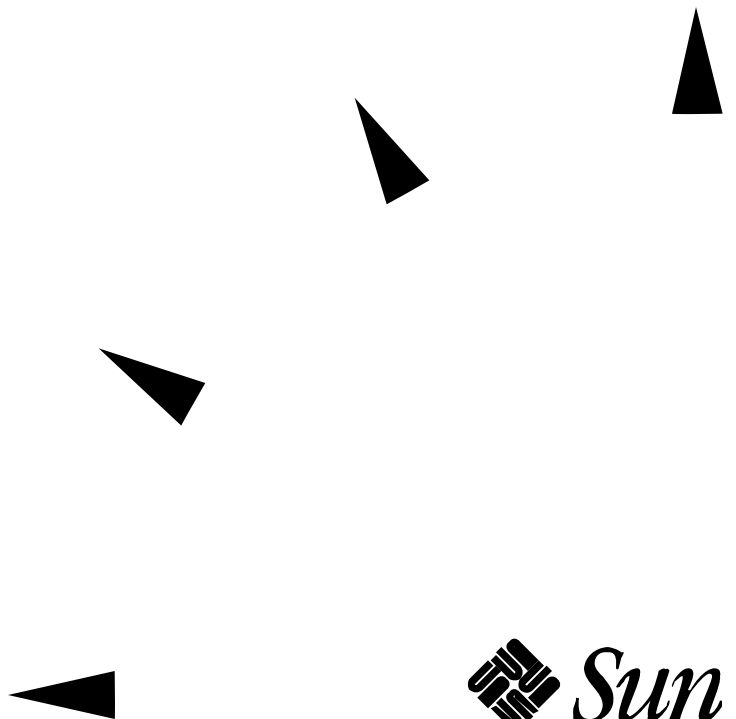


Using Power Management™

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Part No: 802-2608-10
Revision A, November 1995



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Preface

The *Using Power Management* manual describes how to configure Sun™ Ultra™ and SPARCstation™ desktop and nomadic systems to conserve energy.

Who Should Use This Book

This manual is intended for anyone wanting to use Power Management™ software to reduce the power used by a workstation.

How This Book Is Organized

This manual contains the following chapters and appendixes:

Chapter 1, “Introduction to Power Management,” describes the Power Management features and provides guidelines on choosing to use them on an individual desktop machine.

Chapter 2, “Using Power Management,” describes how to use the `dtpower` software on `sun4m` and `sun4u` desktop systems.

Chapter 3, “Using Power Management on SPARCstation Voyager Systems,” describes how to use the `dtpower` software on this nomadic system, which has some additional Power Management features not available on other desktop SPARCstations.

Chapter 4, “Suspend-Resume,” describes the features that enable a desktop system to record its current state when powered down, and then to return to that state when powered up again.

Appendix A, “Configuring Power Management Using the Command Line,” describes an alternative way of using Power Management features through the `pmconfig` command and the `power.conf` file. This appendix also explains how to change the idleness definition by editing the `power.conf` file.

Appendix B, “Troubleshooting,” explains how to respond to various problems and error messages related to Power Management software.

Related Books

The Power Management software is provided on the SMCC Updates CD for the Solaris™ release used by your desktop system. Instructions for installing this software are provided in the *SMCC SPARC Hardware Platform Guide* for this Solaris release.

Typographic Conventions

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 <code>.login</code> file. Use <code>ls -a</code> to list all files. <code>machine_name%</code> You have mail.
AaBbCc123	What you type, contrasted with on-screen computer output	<code>machine_name% su</code> Password:
<i>AaBbCc123</i>	Command-line placeholder: replace with a real name or value	To delete a file, type <code>rm filename</code> .
<i>AaBbCc123</i>	Book titles, new words or terms, or words to be emphasized	Read Chapter 6 in <i>User's Guide</i> . These are called <i>class</i> options. You <i>must</i> 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	machine_name%
C shell superuser	machine_name#
Bourne shell and Korn shell	\$
Bourne shell and Korn shell superuser	#

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Introduction to Power Management



Power Management™ software contributes to improving your system's energy efficiency. Use of this software may be needed for a workstation to meet the U.S. Environmental Protection Agency (EPA) Energy Star guidelines.

Power Management conserves the amount of power that your system consumes. Power conservation is done in two levels:

- Reducing the power consumption of a system component (such as the display monitor or a battery-powered hard disk)
- Removing system power completely in a way that allows (through the Suspend-Resume feature) a quick restoration of the system at the next power on

The Power Management software consists of two utilities:

- `dtpower`
- Suspend-Resume

`dtpower`

The Power Management graphical user interface, `dtpower`, allows you to designate periods of inactivity after which the display will turn off and the system will shut down. You can also use this tool to set the time of day to activate the automatic shutdown; for example, if you wish to use this feature only after your regular work hours.

On sun4u workstations, you can also use `dtpower` to power on the system at a specific time of day after an autoshutdown through the AutoWakeup feature.

How to use this program on sun4m and sun4u desktop machines is described in Chapter 2, “Using Power Management.” If you have a SPARCstation Voyager, refer to Chapter 3, “Using Power Management on SPARCstation Voyager Systems” instead, where additional features unique to that nomadic machine are included.

Suspend-Resume

Suspend-Resume is a new, time-saving feature in the Power Management software that allows you to power cycle your system without losing the state of your current activities. Your workspace and files are preserved when the system is powered off so that they can be restored to the same state when the system is powered on.

For example, you can be in the process of editing a document when you decide to leave and power off your system. By using the Suspend-Resume feature, your edit session is automatically restored and appears in the same state the next time you power on the system.

Suspend-Resume is used automatically when `dtpower` performs an autoshutdown of your workstation. You also can use these features through the keyboard. The Suspend-Resume features are described in more detail in Chapter 4, “Suspend-Resume.”

Choosing to Use Power Management

Powering off a desktop system may interfere with some operations that involve that machine. Take into account the following guidelines before deciding when to use Power Management features on a desktop machine.

Electronic Mail Issues

Mail will not be sent to any mail spool file on a machine while it is suspended. Typically, if mail cannot be delivered for more than three days, it is returned to the sender as undeliverable.

If you suspend your system for three days or longer, and your machine has a local mail spool, you may fail to receive items of mail that have been bounced back to the sender.

Mail Alias Issues

Mail aliases on a machine are not available to other users while that machine is suspended. If the machine is suspended long enough (typically three days), messages sent to an alias on that machine will be bounced back to the sender.

Remote Login Issues

You cannot use `rlogin` to connect to a machine while that machine is suspended. This command does not cause the machine to resume from a suspended state.

While your machine is suspended, you cannot access it by remote dial in.

Cron Job Issues

Operations specified in a cron file do not run while a machine is suspended.

When the time arrives for a cron job to begin for a machine that is suspended, that job does not run at that time, nor is the job queued up to run later when that machine resumes.

Calendar Manager Issues

Calendar Manager does not display pop-up windows for scheduled events that occur while the desktop machine is suspended.

Thermal Stress Issues

The goal of Power Management is to conserve electricity. However, you should also take into account how an increase in power cycling will affect the overall reliability of the hardware.

Power Management software is active by default on a sun4u systems (such as the Sun Ultra™ 1). Accordingly, the Power Management system for those machines is designed to evaluate each automatic power-cycle request that occurs due to the system being idle. If this evaluation determines that the thermal shock of power cycling on this occasion would contribute to decreasing hardware reliability, then this power-cycle request is deferred.

Despite this feature, you can still choose to turn off a sun4u system manually at any time. This checking feature is intended as a brake on the hardware being subjected to an excessive number of automatic power-cycle requests.

Using Power Management



This chapter explains how to use the `dtpower` program to activate or turn off power management features, and to specify when you want the screen or the desktop system to shut down automatically to reduce energy use.

Note – If you are using a SPARCstation Voyager, `dtpower` will provide additional menu selections for controlling that machine’s batteries and hard disks. Refer to Chapter 3, “Using Power Management on SPARCstation Voyager Systems” rather than this chapter.

There are a few differences in how `dtpower` operates on sun4m desktop machines (such as the SPARCstation 20) and on sun4u desktop machines (such as the Sun Ultra 1). In this chapter, any such differences will be pointed out.



Caution – Power Management software cannot be used on systems with ZX (leo) frame buffers. Attempting to suspend such a device will panic the system.

A command line interface is also provided for a system administrator to change a desktop machine’s system default settings and to change the idleness definition. For information on using the `pmconfig` program and the `power.conf` file, go to Appendix A, “Configuring Power Management Using the Command Line.”

To start using `dtpower`, go to the next section (“Starting `dtpower`”) in this chapter.

Starting dtpower

Start dtpower by using one of the following methods.

▼ To start dtpower from the Command Line

1. Become superuser by typing:

```
example% su  
Password: root_password
```

You must become superuser before you can modify any settings in the Power Management software.

2. Start dtpower by typing:

```
example% /usr/openwin/bin/dtpower &
```

▼ To start dtpower from the OpenWindows Menus

◆ Select Power Manager from the Workspace menu under the Programs option if you are using the default OpenWindows menu.

For more information on the Workspace menu, refer to the *Solaris User's Guide*.

The dtpower Icon

If you have run the dtpower program earlier, its icon may be displayed on your desktop already, as shown in Figure 2-1.



Figure 2-1 dtpower Icon

The dtpower Main Window

When you start up dtpower (or double-click on the dtpower icon), the main window is displayed, as shown in Figure 2-2.

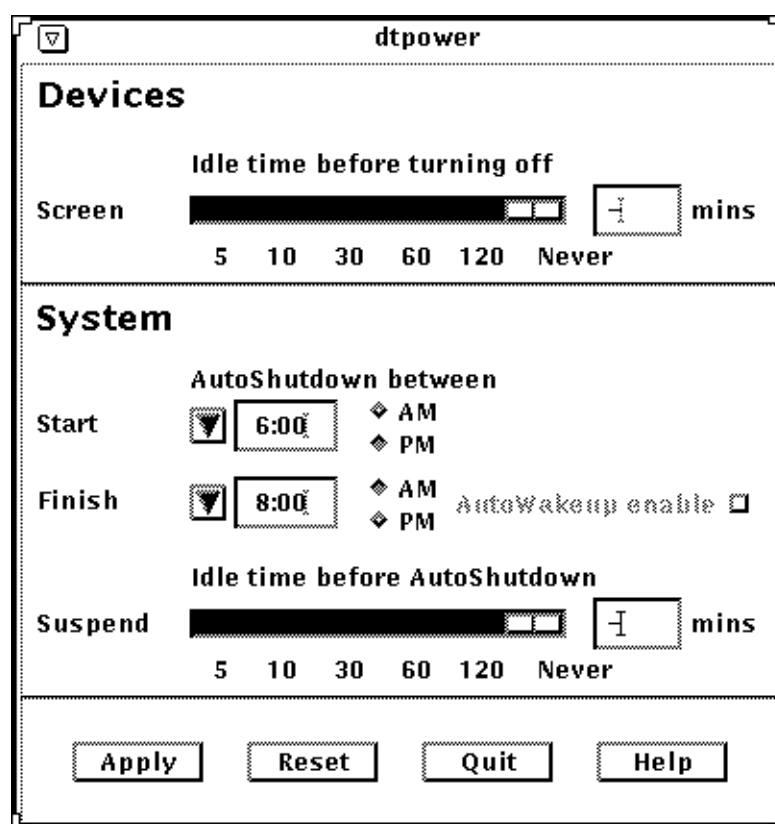


Figure 2-2 dtpower Main Window

Note – “AutoWakeup enable” only appears in this window for sun4u desktop systems.

In this window you can see the current settings for Power Management features. You also can change the settings, as described in the procedures in this chapter.

The buttons at the bottom of this window have the following effects:

- **Apply** puts into effect all the settings currently displayed in the window.
- **Reset** changes all the settings back to the state they were when Apply was previously selected (or to the your machine's default values if this is the first time `dtpower` has been run). Reset, however, will not return to earlier values if you have already selected Apply.
- **Quit** dismisses the `dtpower` window; no icon remains on the screen. Any setting that were not put into effect with the Apply button will be lost.
- **Help** displays a separate window of information about using the `dtpower` window.

To reduce this main window to an icon, select Close from the window bar.

The Devices Panel

You can use the Devices panel of the `dtpower` window to specify whether you want the screen to turn off after a specified number of minutes of idle time.

Note – You can edit the `power.conf` file to change the idleness definition in ways that cannot be done through the `dtpower` window. For information about this, see Appendix A, “Configuring Power Management Using the Command Line.”

▼ To Set an Idle Time for Your Screen

1. **Drag the Screen slider of the Devices panel (Figure 2-3) to set the length of idle time in minutes before your screen will automatically power off.**

You can deactivate automatic control of power for your screen by dragging the Screen slider to the far right position, which is labeled “Never.”

Also, you can set the time by typing the number of minutes directly into the box to the right of the slider.

2. **Click Apply at the bottom of the window.**

In Figure 2-3, the previous setting (“Never”) has been changed to 30 minutes. Your screen will now automatically power off after 30 minutes of inactivity (such as no keystrokes or mouse activity).

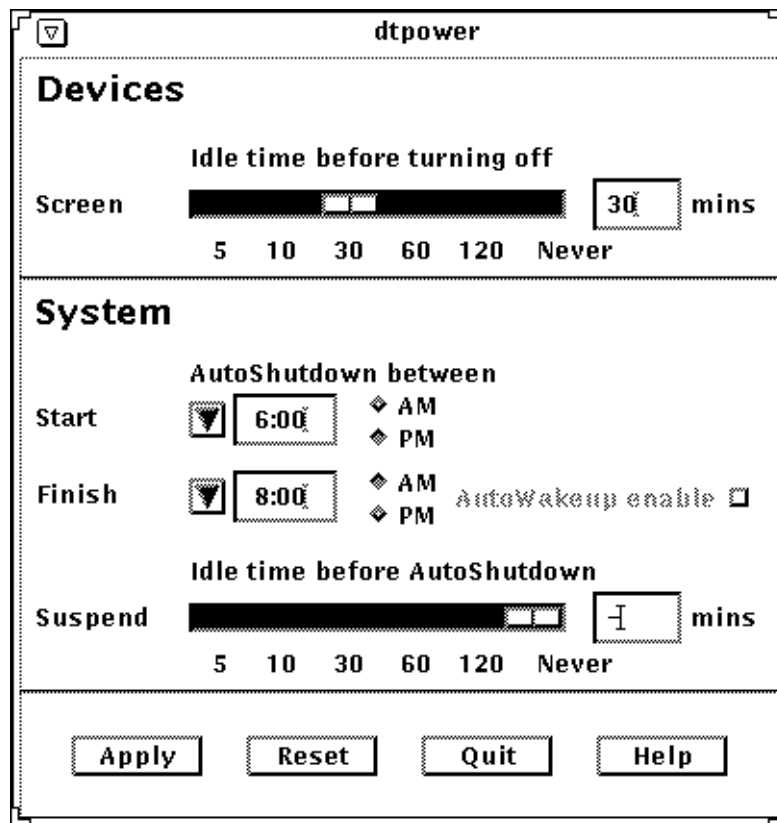


Figure 2-3 Setting a Screen Idle Time

If you have not selected Apply yet, you can return to the previous settings by selecting Reset at the bottom of the window.

The System Panel

On the System panel you can specify the conditions when your system will shut down automatically while idle. On sun4u desktop machines, you can also use this panel to set your system to power on automatically at a specified time each day (this feature is called *AutoWakeup*)

Note – Be sure you have read “Choosing to Use Power Management” on page 2 before changing the AutoShutdown settings.

AutoShutdown uses the Suspend feature to automatically power off your system. When the system powers up again, it will resume in the same state as when it was suspended.

Using the System panel of the `dtpower` window, you can activate or deactivate the AutoShutdown feature, and specify the following times:

- The number of minutes of idle time before AutoShutdown attempts to suspend the system
- The Start and Finish times of the period each day when AutoShutdown can occur (when the Start and Finish times are identical, AutoShutdown can occur at any time)
- The AutoWakeup time when the system will automatically power up and resume after being suspended by AutoShutdown (sun4u desktop systems only)

▼ To Set an Idle Time for AutoShutdown of the System

1. **Start `dtpower` as superuser (see “Starting `dtpower`” on page 6).**
2. **Drag the Suspend slider to the number of minutes of idle time you want before the system will power down automatically.**
If you want to completely deactivate the AutoShutdown feature, select the Never setting at the far right of the slider.

Also, you can type the number of minutes directly in the numerical box to the right of the slider.

3. Select the Start time of the period each day when you want AutoShutdown of the system to be able to take place.

You can select the time (in 15-minute increments) through a menu that drops down from the button closest to the Start label.

Also, you can type the Start time directly into the numerical box.

4. Click on AM or PM for the Start time.

5. Select the Finish time of the period each day when you want AutoShutdown of the system to be able to take place.

You can select the time (in 15-minute increments) through a menu that drops down from the button closest to the Finish label. The last setting on this menu is All Day, which means AutoShutdown can occur at any time of day.

Also, you can type the Finish time directly into the numerical box. You can specify an “All Day” setting this way by entering a Finish time that is identical to the Start time.

6. Click on AM or PM for the Finish time.

7. Click the Apply button at the bottom of the screen when the settings you want are all displayed.

If you want to reject the displayed settings, select Reset and the currently active settings (that is, whatever settings were last put into effect by selecting Apply) will be displayed in the window.

In Figure 2-4, the System panel is set for AutoShutdown of the system after 60 minutes of idle time between 7:30 pm and 9:00 am.

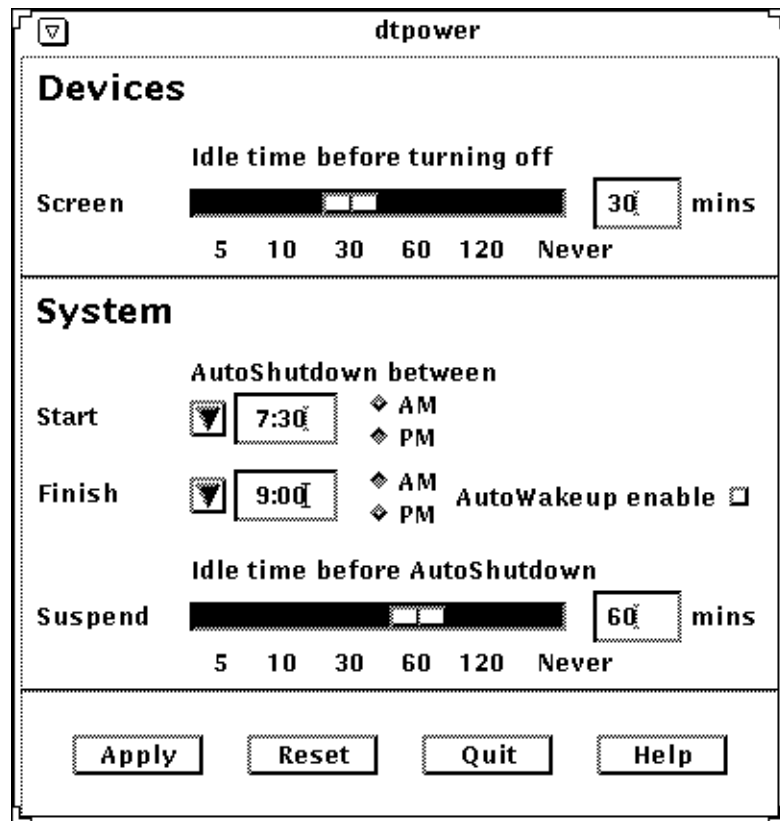


Figure 2-4 Setting the AutoShutdown Timing

▼ To Enable or Disable AutoWakeup of the System

Note – AutoWakeup is available only on sun4u desktop systems.

1. Start `dtpower` as superuser (see “Starting `dtpower`” on page 6).
2. Set the Suspend time to the amount of idle time you desire (that is, any setting other than Never).

3. Set the Finish time to the time you want the machine to power up from a suspended state every day.
4. Click the AutoWakeup enable button to turn this feature on or off.
5. Click the Apply button at the bottom of the screen when the settings you want are all displayed.
If you want to reject the displayed settings, select Reset and the currently active settings (that is, whatever settings were last put into effect by selecting Apply) will be displayed in the window.

In Figure 2-5, the System panel is set for AutoWakeup to occur at 9:00 am every day if an AutoShutdown has occurred after 7:30 pm.

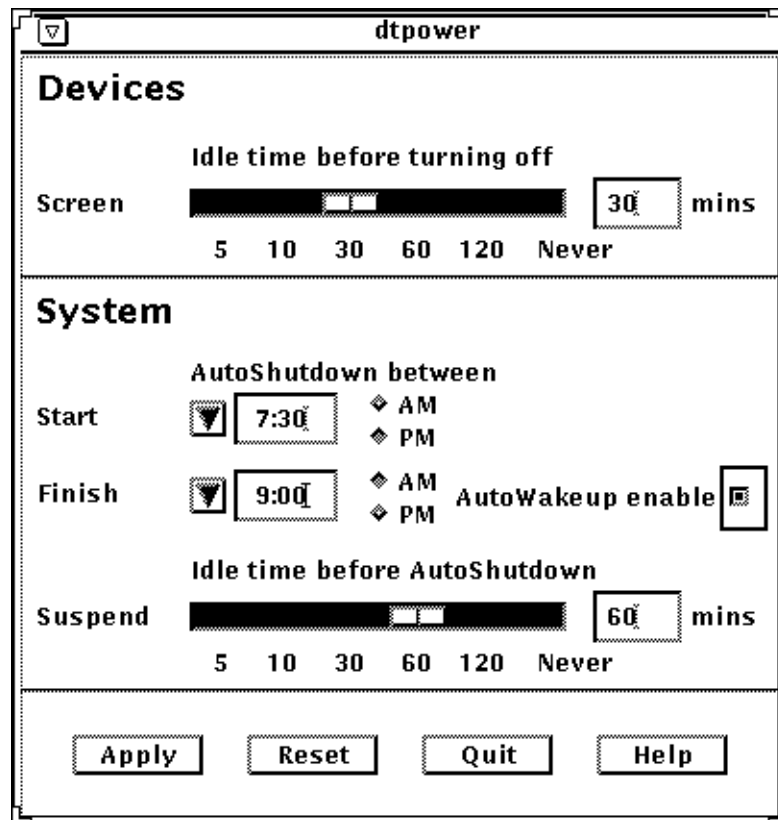


Figure 2-5 Enabling AutoWakeup

Exiting dtpower

Make sure you have clicked Apply if you want to activate any new settings you have made in this window.

▼ **To exit** dtpower

◆ **Click Quit at the bottom of the** dtpower **window.**

This causes the window to disappear without the dtpower icon remaining on the screen.

Using Power Management on SPARCstation Voyager Systems



This chapter explains how to use the `dtpower` program to activate or turn off power management features, and to specify when you want the screen, hard disk, or the SPARCstation Voyager system to shut down automatically to reduce energy use.

Note – If you are not using a SPARCstation Voyager, `dtpower` will provide different selections in its menu. Refer to Chapter 2, “Using Power Management” (rather than this chapter) for an explanation of using Power Management features on `sun4m` and `sun4u` desktop machines.

The `dtpower` program is integrated into the whole Power Management system for this nomadic computer. For example, if a SPARCstation Voyager is operating only on battery power, the system will automatically suspend when it is about to exhaust the battery charge, regardless of what you have specified with the `dtpower` command.

A command line interface is also provided for a system administrator to change a workstation’s system default settings. For information on using the `pmconfig` program and the `power.conf` file, go to Appendix A, “Configuring Power Management Using the Command Line”.

To start using `dtpower`, go to the next section (“Starting `dtpower`”) in this chapter.

Starting dtpower

Start `dtpower` by using one of the following methods.

▼ To start `dtpower` from the Command Line

1. Become superuser by typing:

```
example% su  
Password: root_password
```

You must become superuser before you can modify any settings in the Power Management software.

2. Start `dtpower` by typing:

```
example% /usr/openwin/bin/dtpower &
```

▼ To start `dtpower` from the OpenWindows Menus

◆ Select Power Manager from the Workspace menu under the Programs option if you are using the default OpenWindows menu.

For more information on the Workspace menu, refer to the *Solaris User's Guide*.

The `dtpower` Icon

If you have already run the `dtpower` program, its icon may be displayed in one of the following ways:

- This `dtpower` icon appears when the SPARCstation Voyager is connected to a wall outlet (that is, operating on AC).



- One of these two `dtpower` icons appears when the SPARCstation Voyager is operating from a battery. The first indicates how many minutes of operation remain before recharging is needed. The second indicates that the battery is charging.



The dtpower Main Window

When you start up dtpower (or double-click on the dtpower icon), the main window is displayed, as shown in Figure 3-1.

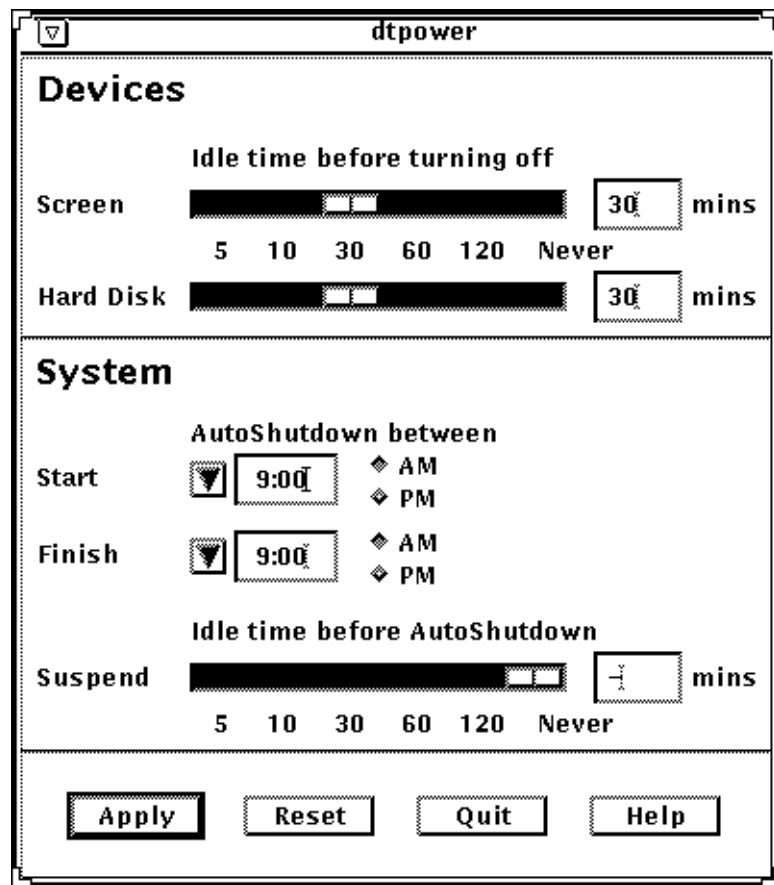


Figure 3-1 dtpower Main Window for the SPARCstation Voyager

In this window you can see the current settings for Power Management features. You also can change the settings, as described in the procedures in this chapter. Figure 3-1 indicates the default settings for Power Management on a SPARCstation Voyager.

The buttons at the bottom of this window have the following effects:

- **Apply** puts into effect all the settings currently displayed in the window.

- **Reset** changes all the settings back to the state they were when Apply was previously selected (or to the your machine's default values if this is the first time `dtpower` has been run). Reset, however, will not return to earlier values if you have already selected Apply.
- **Quit** dismisses the `dtpower` window; no icon remains on the screen. Any setting that were not put into effect with the Apply button will be lost.
- **Help** displays a separate window of information about using the `dtpower` window.

To reduce this main window to an icon again, select Close from the window bar.

The Devices Panel

You can use the Devices panel of the `dtpower` window to specify whether you want the screen or hard disk to turn off after a specified number of minutes of idle time for each device.

▼ To Set an Idle Time for Your Screen

1. **Drag the Screen slider of the Devices panel (Figure 3-2) to set the length of idle time in minutes before your screen will automatically power off.**

You can deactivate automatic control of power for your screen by dragging the screen slider to the far right position, which is labeled "Never."

Also, you can set the time by typing the number of minutes directly into the box to the right of the slider.

2. **Click Apply at the bottom of the window.**

In Figure 3-2, the previous setting (“Never”) has been changed to 30 minutes. Your screen will now automatically power off after 30 minutes of inactivity (that is, no keystrokes or mouse activity).

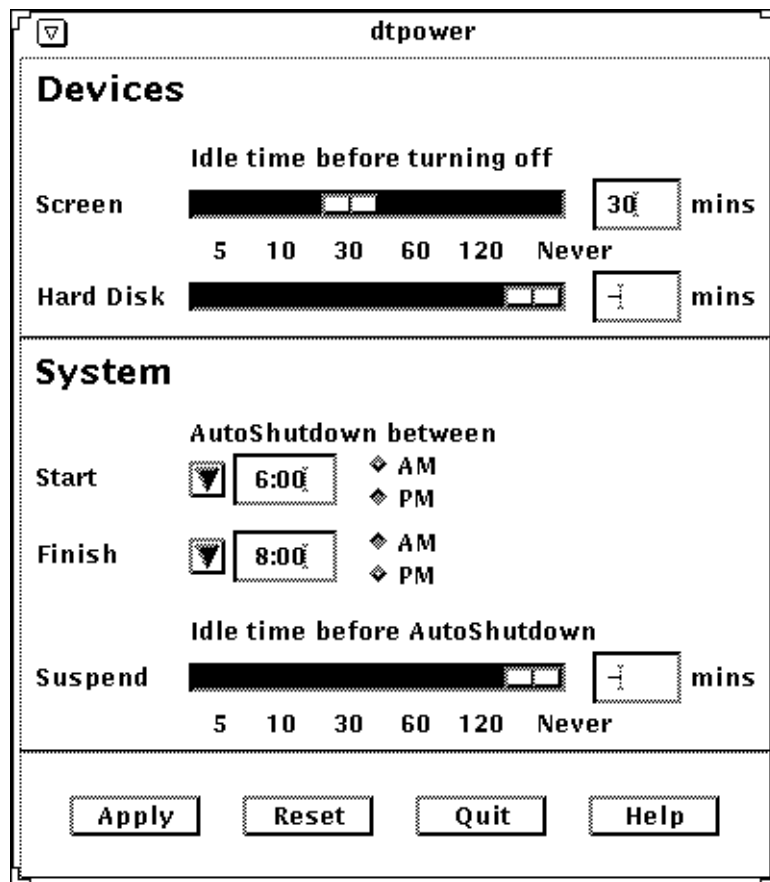


Figure 3-2 Setting a Screen Idle Time for a SPARCstation Voyager

If you have not selected Apply yet, you can return to the previous settings by selecting Reset at the bottom of the window.

▼ **To Set an Idle Time for Your Hard Disk**

- 1. Drag the Hard Disk slider of the Devices panel (Figure 3-3) to set the length of idle time in minutes before your hard disk will automatically power off.**

You can deactivate automatic control of power for your hard disk by dragging the hard disk slider to the far right position, which is labeled “Never.”

Also, you can set the time by typing the number of minutes directly into the box to the right of the slider.

- 2. Click Apply at the bottom of the window.**

In Figure 3-3, the previous setting (“Never”) has been changed to 60 minutes. This hard disk will automatically power off after 60 minutes of inactivity (that is, no keystrokes or mouse activity).

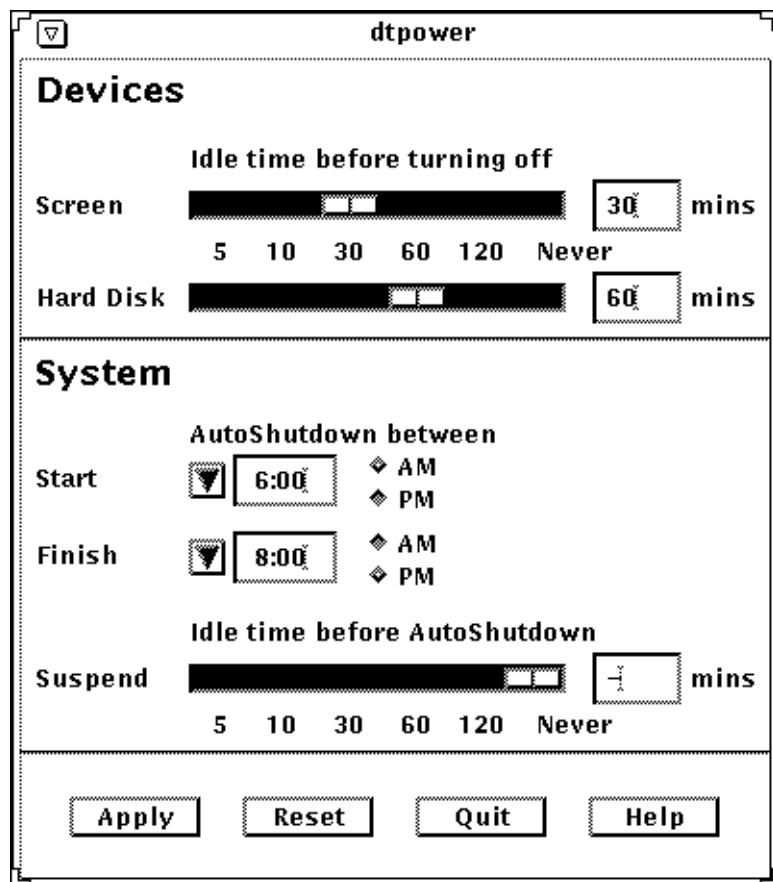


Figure 3-3 Setting a Hard Disk Idle Time for a SPARCstation Voyager

If you have not selected Apply yet, you can return to the previous settings by selecting Reset at the bottom of the window.

The System Panel

On the System panel you can specify the conditions when your system will shut down automatically while idle.

Note – Be sure you have read “Choosing to Use Power Management” on page 2 before changing the AutoShutdown settings.

AutoShutdown uses the Suspend feature to automatically power off your system. When the system powers up again, it will resume in the same state as when it was suspended.

Using the System panel of the `dtpower` window, you can activate or deactivate the AutoShutdown feature, and specify the following times:

- The number of minutes of idle time before AutoShutdown attempts to suspend the system.
- The Start and Finish times of the period each day when AutoShutdown can occur. (When the Start and Finish times are identical, AutoShutdown can occur at any time.)

▼ To Set an Idle Time for AutoShutdown of the System

1. Start `dtpower` as superuser (see “Starting `dtpower`” on page 16).

2. Drag the Suspend slider to the number of minutes of idle time you want before the system will power down automatically.

If you want to completely deactivate the AutoShutdown feature, select the Never setting at the far right of the slider.

Also, you can type the number of minutes directly in the numerical box to the right of the slider.

3. Select the Start time of the period each day when you want AutoShutdown of the system to be able to take place.

You can select the time (in 15-minute increments) through a menu that drops down from the button closest to the Start label.

Also, you can type the Start time directly into the numerical box.

4. Click on AM or PM for the Start time.

5. Select the Finish time of the period each day when you want AutoShutdown of the system to be able to take place.

You can select the time (in 15-minute increments) through a menu that drops down from the button closest to the Finish label. The last setting on this menu is All Day, which means AutoShutdown can occur at any time of day.

Also, you can type the Finish time directly into the numerical box. You can specify an “All Day” setting this way by entering a Finish time that is identical to the Start time.

6. Click on AM or PM for the Finish time.

7. Click the Apply button at the bottom of the screen when the settings you want are all displayed.

If you want to reject the displayed settings, select Reset and the currently active settings (that is, whatever settings were last put into effect by selecting Apply) will be displayed in the window.

In Figure 3-4, the System panel is set for AutoShutdown of the system after 60 minutes of idle time between 7:30 pm and 9:00 am.

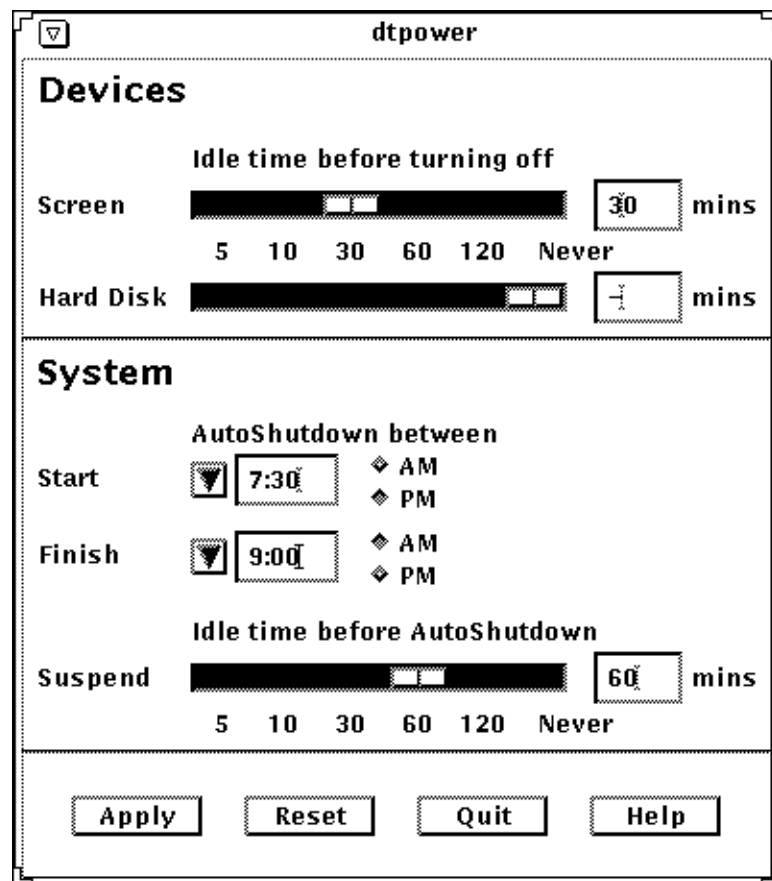


Figure 3-4 Setting the AutoShutdown Timing for a SPARCstation Voyager

Exiting dtpower

Make sure you have clicked Apply if you want to activate any new settings you have made in this window.

▼ To exit `dtpower`

◆ **Click Quit at the bottom of the `dtpower` window.**

This causes the window to disappear without a `dtpower` icon remaining on the screen.

Suspend-Resume



The Power Management software introduces a new timesaving feature, called *Suspend-Resume*.

The traditional process of powering off your system can be time consuming. Similarly, the process of rebooting and setting up your workspace also can take some time. With the Suspend-Resume feature, you can power off your system and quickly save all your current work in process automatically. Then, at the next power on, your workspace quickly returns to the way it was when you last used the system.

You can leave your system suspended and powered off for an indefinite length of time without data loss. However, there are some outside operations (such as receiving mail) that may be affected while your system is suspended. Before you use Suspend-Resume features, be sure to read “Choosing to Use Power Management” in Chapter 1, “Introduction to Power Management.”

Note – The Suspend-Resume feature is not supported on systems configured as diskless clients.

Suspending a system can occur automatically through the AutoShutdown feature in the Power Management software. Also, you can suspend your system manually using the keyboard by following instructions in the next section.

Suspend allows you to do the following without losing state:

- Move your system from one location to another

- Power off your system to conserve energy
- Switch the system power source from a battery to the wall outlet (AC power supply) or vice-versa

Note – Do not use the Suspend feature if you need to reconfigure your system. You must halt the operating system whenever you want to reconfigure your system.

Before you suspend a system, you must wait for the following operations to finish:

- Audio activity
- Floppy disk activity
- Tape activity
- ISDN activity
- Synchronous tty activity

Using Suspend

Initiating a Suspend and a subsequent Resume usually requires less than a minute. You can initiate Suspend from the keyboard, the Workspace Utilities menu, or the shell command.

▼ To Initiate Suspend Using the Keyboard

1. **Press the power key.**

See Figure 4-1 and Figure 4-2 for the location of the power key.

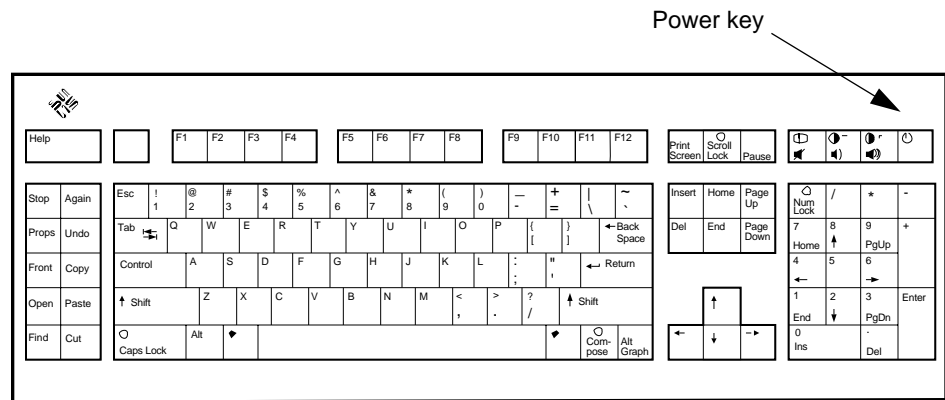


Figure 4-1 Power Key Location — Sun Type 5 Keyboard

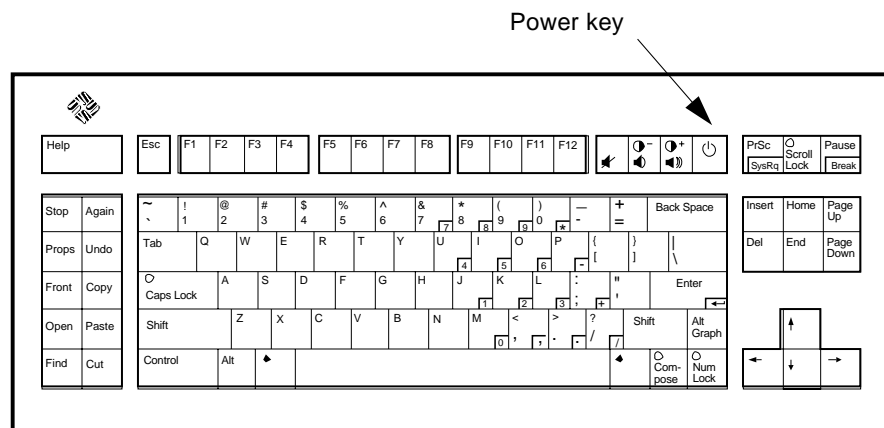


Figure 4-2 Power Key Location — Sun Compact 1 Keyboard

After you press the power key, the pop-up confirmation window of the Workspace utility is displayed, as in Figure 4-3

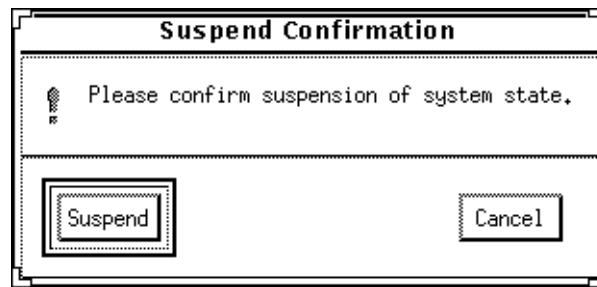


Figure 4-3 Suspend Confirmation Message

2. Click on Suspend.

3. Wait for the system to power off.

4. Power off all external devices.

External devices include disk drives, printers, or other serial or parallel peripherals. See the manual supplied with the external device for instructions.

▼ **To Initiate Suspend Using Keyboard Shortcuts**

1. Press Shift and the power key.

See Figure 4-1 or Figure 4-2 for the location of the power key.

2. Wait for the system to power off.

3. Power off all external devices.

External devices include external disk drives, printers, or other serial or parallel peripherals. See the manual supplied with the external device for instructions.

▼ **To Initiate Suspend Using Workspace Utilities**

1. Place your cursor in the workspace and hold down the menu button.

The Workspace menu is displayed.

2. Select Utilities with the menu button.

3. Select the Suspend menu option.

The Suspend confirmation is displayed, as shown in Figure 4-3.

4. Select Suspend.

The confirmation pop-up will appear after you select Suspend.

5. Wait for the system to power off.**6. Power off all external devices.**

External devices include disk drives, printers, or other serial or parallel peripherals. See the manual supplied with the external device for instructions.

▼ To Initiate Suspend Using the `sys-suspend` Command

Note – You do not need to be running a window system, such as the OpenWindows environment, for the `sys-suspend` shell command to work.

1. At the prompt, type:

```
example% /usr/openwin/bin/sys-suspend
```

The Suspend confirmation pop-up window is displayed, as shown in Figure 4-3. If a window system is not running, the command executes without displaying the confirmation pop-up window.

2. Click on Suspend.**3. Wait for the system to power off.****4. Power off all external units.**

External devices include disk drives, printers, or other serial or parallel peripherals. See the manual supplied with the external device for instructions.

Resuming Your System

You can use the following method to manually Resume using a system that has been put into a suspended state by any method.

▼ **To Resume a Suspended System**

- 1. Power on all external devices connected to your system.**
- 2. Press the power key.**

See Figure 4-1 or Figure 4-2 for power key locations.

Configuring Power Management Using the Command Line



Introduction

This chapter explains how you can change the system default settings for the Power Management utilities on systems that are not configured to run the OpenWindows environment. Also, you can edit the `/etc/power.conf` file to change the definition of idleness for a system in ways that cannot be set through the `dtpower` user interface.

Note – Refer to the `power.conf` man page for additional information.

Idleness Definition

In earlier releases of Power Management software, inactivity of a system was defined only in terms of the amount of time since the last keyboard or mouse activity. Now, additional aspects of a machine's activity are taken into account. By default, a machine is considered inactive when all of these conditions apply:

- No keyboard stroke
- No mouse movement
- No tty characters are input or output
- No disk reads
- No NFS requests

- A 1-minute load average is no greater than 0.04

To change the idleness definition from these defaults, see Section , “Changing the Idleness Definition,” on page 37.

The power.conf File

The default `/etc/power.conf` file has the following content:

```
# This is a sample power management configuration file
# Fields must be separated by white space.

# Name          Threshold(s)    Logical Dependent(s)
/dev/kbd        1800
/dev/mouse      1800
/dev/fb         0 0             /dev/kbd /dev/mouse

# This entry is maintained by dtpower(1M)
# This (default as of Solaris 2.5) entry causes the system to be
# shut down after 30 minutes of idle time if it is a model shipped
# after Oct 1, 1995. Older models default to noshutdown.
#
#
# Auto-Shutdown  Idle(min)      Start/Finish(hh:mm)  Behavior
autoshtdown     30             17:00 8:00           default
```

Logical Dependents

In the `/etc/power.conf` file, there are entries for “Logical Dependent(s).” These are physical devices (such as a mouse) whose activity is related to another device (such as a frame buffer) without being physically attached to it.

If a logical dependent device is active, then the main device is considered active as well. This affects idle times for the main device.

Becoming Superuser

To change any of the system default settings, using the procedures in this section, you first must become superuser.

▼ To become superuser

◆ Become superuser by typing:

```
example% su
Password: root password
example#
```

Setting Device Idle Time

The length of idle time before a system device (such as a screen) uses the low power mode is specified by the threshold field in the `/etc/power.conf` file.

▼ To change the length of idle time

1. Edit the `/etc/power.conf` file. Type:

```
example# vi /etc/power.conf
```

2. Modify the desired entry.

The idle threshold for the keyboard and mouse devices have been revised to be 300 seconds (5 minutes) in the `/etc/power.conf` file, as shown below.

```
# This is a sample power management configuration file
# Fields must be separated by white space.

# Name          Threshold(s)    Logical Dependent(s)
/dev/kbd        300
/dev/mouse      300
/dev/fb         0 0             /dev/kbd /dev/mouse

# This entry is maintained by dtpower(1M)
# This (default as of Solaris 2.5) entry causes the system to be
# shut down after 30 minutes of idle time if it is a model shipped
# after Oct 1, 1995. Older models default to noshtutdown.
#
#
# Auto-Shutdown  Idle(min)      Start/Finish(hh:mm)  Behavior
autoshtutdown   30             17:00 8:00           default
```

3. Inform the Power Management framework of the new settings. Type:

```
example# /usr/sbin/pmconfig
```

Running `pmconfig` informs the Power Management framework of the new setting according to the thresholds that are now defined in the `/etc/power.conf` file.

Setting AutoShutdown

▼ To change the automatic shutdown time

1. Edit the AutoShutdown entry in `/etc/power.conf` file. Type:

```
example# vi /etc/power.conf
```

The AutoShutdown feature has been set to “always” in this portion of an `/etc/power.conf` file, as shown below (that is, the Start and Finish times are identical). This means your system will always power off after a 30 minute period of inactivity.

# Auto-Shutdown	Idle(min)	Start/Finish(hh:mm)	Behavior
autoshtutdown	30	0:00 0:00	shutdown

The AutoShutdown time in the portion of the `/etc/power.conf` file shown below is set to power off your system every day between 5:30 pm and 8:00 am after a 30 minute period of inactivity.

Note – The start and finish times must be entered in a 24-hour format.

# Auto-Shutdown	Idle(min)	Start/Finish(hh:mm)	Behavior
autoshtutdown	30	17:30 8:00	shutdown

2. Inform the Power Management framework of the new settings. Type:

```
example# /usr/sbin/pmconfig
```

Running `pmconfig` informs the Power Management framework of the new setting according to the thresholds that are now defined in the `/etc/power.conf` file.

Changing the Idleness Definition

You can change the idleness definition for a system from the default by adding entries to the `/etc/power.conf` file. These entries will change the thresholds for certain system operations that can occur before the system is no longer considered inactive:

- `ttychars` changes the number of tty characters that can be input or output before the system is considered active (the default is no characters)
- `diskreads` changes the number of disk reads that can occur before the system is considered active (the default is no disk reads)

- `nfsreqs` changes the number of NFS requests that can occur before the system is considered active (the default is no NFS requests)
- `loadaverage` changes the 1-minute load average that is reached before the system is considered active (the default is 0.04)

You cannot, however, change the threshold for keyboard or mouse activity. Any such activity will conclude idleness for a system.

For example, you can revise your `power.conf` file to change the system's idleness definition so that it is still considered idle if:

- No more than 400 tty characters are input or output
- No more than 10 disk reads occur
- No more than 5 NFS requests occur
- The 1-minute load average hasn't exceeded 0.1

The resulting `/etc/power.conf` file appears like the following:

```
# This is a sample power management configuration file
# Fields must be separated by white space.

# Name          Threshold(s)    Logical Dependent(s)
/dev/kbd        1800
/dev/mouse      1800
/dev/fb         0 0             /dev/kbd /dev/mouse

# This entry is maintained by dtpower(1M)
# This (default as of Solaris 2.5) entry causes the system to be
# shut down after 30 minutes of idle time if it is a model shipped
# after Oct 1, 1995. Older models default to noshutdown.
#
#
# Auto-Shutdown  Idle(min)      autoshutdown in effect
# Auto-Shutdown  Idle(min)      Start/Finish(hh:mm)   Behavior
autoshutdown     30             17:00 8:00            default

ttychars       400
diskreads     10
nfsreqs       5
loadaverage   0.1
```

Using a Script to Define Idleness

You can create a script that tests additional criteria that must be met before a system is considered inactive long enough to trigger an autosshut down. After all other idleness criteria have been met, an `idlecheck` entry in the `/etc/power.conf` file will cause the script you name in that entry to be run. For example, a script located in the `/home/grumpy` directory is run on a system that has the following `idlecheck` line in its `/etc/power.conf` file whenever the system has been idle according to all other criteria defined in the `/etc/power.conf` file:

```
# The idlecheck program is passed autosshut down idle time entry
# in $PM_IDLETIME and returns the number of minutes the system
# has been idle in exit code
idlecheck          /home/grumpy/idlecheck
```

Your script should return an exit code representing minutes of idle time. If the exit code is equal or greater than the idle time listed in the “autosshut down” entry of the `/etc/power.conf` file, your system will be shut down. If the script reports a lower number than the stated idle time, your system will not be shut down.

Note – When you create such a script for `idlecheck`, make sure it is executable and that it returns an exit code. If the script does not produce an explicit exit code, the value zero is returned, which will indicate that the system is busy and that autosshut down will not occur.

Troubleshooting



This appendix provides troubleshooting procedures if the power key does not suspend your system or if you need to recover from a hung system.

Power Key Problems

If pressing the power key does not suspend your system, refer to the following procedure.

▼ Power Key Does Not Suspend the System

1. Verify that the key processing daemon is present by typing this command.

```
% ps -eaf | grep speckeyd
```

2. If the resulting message does not list `/usr/openwin/bin/speckeyd`, start the key processing daemon by entering:

```
% /usr/openwin/bin/speckeyd
```

Suspend Failures

When the system fails to suspend, an alert pop-up window appears. The exact message within the window may vary, depending on the cause of the problem, but the window is displayed as shown in Figure B-1.

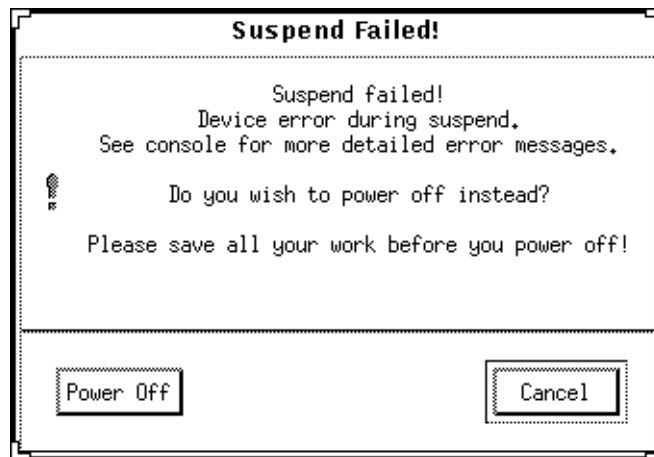


Figure B-1 Example of a “Suspend Failed!” Alert Pop-Up Window

When a “Suspend Failed!” window appears, you can choose to click either of the buttons at the bottom of the window:

- **Power Off** will turn off power *without* preserving the current operating state, as a suspend operation usually would.
- **Cancel** will cancel the suspend request, and the hardware will continue to be powered up.

The following sections discuss specific “Suspend Failed!” messages.

What to Do If a Device Suspend Fails

If a device fails to suspend, an “Suspend Failed!” pop-up window is displayed, which includes the following message:

Device error during suspend.

▼ To Respond to a Device Suspend Failure

1. Select Cancel.

If you have not already saved your work, do so now. Take corrective action before retrying suspend again.

2. Check for more information in the Console window in the Workspace.

An unsupported device or a device performing non-resumable activity may be the cause of this problem.

If the device specified by the console message is performing a non-resumable activity, stop the activity and try suspend again, as described in Step 4.

If your system contains devices in addition to the default configuration, then these devices may not support the Suspend feature. In that case, continue with the next step.

3. Unload the device driver (contact your system administrator) and try suspend again.

However, you might not be able to unload a driver for one of these reasons:

- There is no detach support in the code (such as `lebuffer`).
- Another driver must be unloaded first (such as `audio` and `dbri`).
- The device is actually in use and busy.

In such a case, do the following steps:

a. Get the module ID by running `modinfo`.

b. Unload that module by running this command:

```
modunload -i module_id
```

4. Try Suspend again.

- If Suspend succeeds, the system will save your activities and the system will power off successfully.
- If Suspend does not succeed, the alert pop-up window is displayed again. In that case, continue with the next step.



Caution – Save your work if you have not already done so.

5. Select Power Off.

Since the error persists, suspend is not possible. Selecting “Power Off” shuts down the system properly without causing file system damage. (Remember— your data will *not* be saved unless you have saved it manually.) When you power on again, your system automatically reboots.

However, if you select Power Off and it fails, your system does not support software power off. An alert pop-up window is then displayed with information about the power-off failure, as shown in Figure B-2.

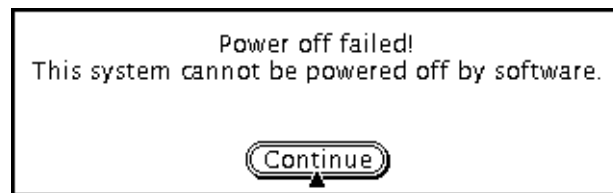


Figure B-2 Power Off Failure Window

6. Select Continue.

Your system might not support software power off due to a non-type 5 keyboard or an outdated system PROM. If you do have a type 5 keyboard installed then contact your system provider for a system PROM upgrade.

7. Save your work if you have not already done so.**8. Halt the Operating System.****9. Power off by pressing the power switch on the back panel of the system to the off (0) position.**

Note – When possible, solve the problem for that device in the future by obtaining and installing a device driver that supports suspend, if one is available from your manufacturer.

What to Do If a Process Fails to Suspend

If a process fails to suspend, an alert pop-up window is displayed, which includes the following message:

Process can not be stopped.

Follow this procedure in response to this message.

▼ To Respond to a Process Suspend Failure

1. Select Cancel.

Retry suspend again. If you have not already saved your work, do so now.

2. Check for more information in the Console window in the Workspace.

If a process is a real-time process or if it is performing certain special network operations, that process may refuse to suspend gracefully. In most cases, this is only a temporary condition and can be corrected by trying suspend again.

However, if the problem persists, stop the offending process (as specified in the console message) and retry suspend again.

3. Try Suspend again.

- If Suspend succeeds, the system will save your activities and the system will power off.
- If Suspend does not succeed, the alert pop-up window is displayed again.



Caution – Save your work if you have not already done so.

4. Select Power Off.

Remember—your data will *not* be saved unless you have done so manually.

When you power on again, your system automatically reboots.

What to Do If More Disk Space Is Needed

If the / file system is full, an alert pop-up window is displayed, which includes the following message:

```
Suspend requires more space in /.
```

Follow this procedure in response to this message.

▼ **To Respond to a Disk Space Limitation**

1. Select Cancel.

You'll need to take corrective action before you can try to suspend again.

If you have not already saved your work, do so now.

2. Check for more information in the Console window in the Workspace.

You must have a minimum of 10 MBytes of space in your root partition. Clean up the root partition before you try suspend again. Contact your system administrator for assistance if necessary.

3. Try Suspend again.

- If Suspend succeeds, the system will save your activities and the system will power off.
- If Suspend does not succeed, the alert pop-up window is displayed again. In that case, continue with the next step.



Caution – Save your work if you have not already done so.

4. Select Power Off.

Remember—your data will *not* be saved unless you have done so manually.

When you power on again, your system automatically reboots.

What to Do If Abnormal Conditions Occur

If an abnormal condition occurs, an alert pop-up window is displayed, which includes the following message:

```
Abnormal condition during suspend.
```

Follow this procedure in response to this message.

▼ **To Respond to an Abnormal Condition**

1. Select Cancel.

You'll need to take corrective action before you can try to suspend again.

If you have not already saved your work, do so now.

2. Check for more information in the Console window in the Workspace.
You may be able to take further corrective action by checking the console error messages.

3. Try Suspend again.

- If Suspend succeeds, the system will save your activities and the system will power off.
- If Suspend does not succeed, the alert pop-up window is displayed again. In that case, continue with the next step.



Caution – Save your work if you have not already done so.

4. Select Power Off.

Remember—your data will *not* be saved unless you have done so manually.

When you power on again, your system automatically reboots.

