Using Power Management

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Preface

Using Power Management describes how to configure and operate workstations to conserve energy using the Power Management™ software provided within the Solaris™ operating environment. The software for managing system power is not intended for use on server computers; however, techniques described in this manual for managing power for a display connected to a server computer may be of value.

This manual describes how to use Power Management features on workstations produced by Sun Microsystems, Inc™. If you are using this Solaris release on hardware supplied by another manufacturer, refer to information sources for those products to determine whether this Power Management software can be used with your hardware. Also refer to your hardware manufacturer's documentation to determine which distinctions within this manual (such as between machines with sun4m and sun4u architectures) apply to your hardware.

How This Book Is Organized

This manual contains the following chapters:

Chapter 1 describes the value of reducing power consumption and provides an overview of how Power Management features can help achieve that goal.

Chapter 2 gives an overview of the Dtpower graphical user interface (GUI), its conventions, and basic power saving schemes.

Chapter 3 describes how to create a customized power saving scheme by overriding the schemes for system, monitor, and disk drive power.

Chapter 4 discusses the ramifications of using Suspend-Resume on ongoing system processes and issues that should be considered before choosing this feature. It describes the power off and power on features, as well as ways to save your system

state when you power down and resume in the saved state. It also explains how to respond to various problems and error messages related to the Suspend-Resume feature.

Typographic Conventions

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

Shell Prompts

Shell	Prompt
C shell	*machine_name*%
C shell superuser	*machine_name*#

Shell	Prompt
Bourne shell and Korn shell	$
Bourne shell and Korn shell superuser	#

Related Documentation

Application	Title
Sun Hardware Products	*Sun Hardware Platform Guide*
Development	*Writing Device Drivers* (Part of the Solaris 8, Software Developer Collection)

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CHAPTER 1

Introduction to Power Management

This chapter gives an overview of Power Management™ and explains the features that apply to your system by default when you use this Solaris™ release. It also explains what ways you might choose to customize use of those Power Management features. Later chapters in this book provide details on how to customize the settings.

Value of Power Management

Reducing the amount of power consumed by a computer not only reduces the cost of the electricity itself, it also reduces the efforts required to control the heat surrounding the computer. Reducing power consumption also can extend the effective life of the hardware you use.

The United States Environmental Protection Agency (EPA) has established Energy Star® guidelines for computer products. Other nations have issued similar energy efficiency guidelines. To meet these guidelines, hardware products are designed to use power efficiently.

The Power Management software provided in the Solaris operating environment works in conjunction with the hardware to reduce overall consumption of electricity. In some cases, you may need to use this software for your workstation to meet the Energy Star guidelines that apply to that hardware.

Note - As an Energy Star Partner, Sun Microsystems, Inc. has determined that its hardware products that have the Energy Star symbol on the shipping box or on the product itself meet the Energy Star guidelines for energy efficiency.

Types of Power Management

Power Management software enables two ways of reducing power consumption: Device power management and Suspend-Resume.

Device Power Management

Device power management automatically reduces the amount of power used by individual devices when they are not in demand to perform some function. Disk drives, monitors, adapters, and even CPUs can provide this power-saving feature. The effect of device power management is transparent to the computer user. The overall system is still in operation, and is able to respond to requests for service from devices. Those devices are able to power up for full service within seconds when needed.

Suspend-Resume

Suspend-Resume is a time-saving feature that allows you to turn off the power to your system without losing the state of your current activities. When you use this feature, your workspace and files are preserved when the system is powered off and restored to the same state when the system is powered on. For example, if you are in the middle of revising a document when you decide to leave, you can power off your system using the Suspend feature and your work session is automatically saved. The next time you power on the system, the Resume feature causes your work to appear in the same state as you left it. Whether a shutdown is initiated automatically (through Power Management software) or manually through keystrokes, the Suspend-Resume feature saves checkpoint information about the state of the system at that time.

Suspend-Resume can be active on your system in the following ways:

- Suspend-Resume is used automatically in some Energy Star 2.0-compliant systems.
- You can use the keyboard to suspend or resume your system whenever you choose. The steps for doing this are explained in Chapter 4.
- Dtpower software can be used to activate Suspend-Resume automatically at designated times.

Caution - Do not use System Power Management on systems that do work that should not be interrupted. Conditions where you should choose to not use the Suspend-Resume features are described in Chapter 4.

Hardware Support for Power Management Features

All SPARC workstations can use some features of the Power Management software. However, some features only work on certain types of hardware. Some default power states vary from one type of system to another.

The following section describes the Power Management features that are supported by your hardware, as well as the defaults that will be in effect when you first use this Solaris release with your hardware.

Note - Intel hardware running the Solaris operating environment does not support Power Management.

Power Management Features on Different Hardware Systems

The Power Management features are enabled by both the hardware's power-saving capability and the software provided with the Solaris operating environment. The exact nature of the power-saving mode your system goes into depends on your hardware and its compliance with Energy Star. To determine the version of Energy Star to which your system complies, use the `prtconf -vp | grep energystar` command.

Power Management-capable hardware provides the features discussed in the following sections.

Energy Star 3.0-Compliant Systems

The Energy Star 3.0-compliant SPARC™ hardware reduces power consumption by entering a low-power mode from which devices can resume full operation automatically. This hardware can turn off monitors and frame buffers, spin down disks, and drop the devices' power consumption significantly when they are idle — all while leaving the system up and running, ready for use, and visible on the network. When a job appears on the system, either through a `cron` process, or an external demand through a network, the devices and other hardware snap back into full-power mode within seconds.

Energy Star 2.0-Compliant Systems

The earlier, Energy Star 2.0-compliant SPARC hardware does not have the capability of going into a reduced-power mode; after the designated minutes of idleness, the system completely shuts down. The exception to this are the monitors, which do have the capability of going into low-power mode and continuing to operate. Upon restart, the system takes a minute to reboot.

Systems Noncompliant with Energy Star

Systems that are noncompliant with Energy Star regulations perform power management for only the monitor; no other devices are power managed.

System Architecture Distinctions and Default Settings

The SPARC architecture of a workstation determines which Power Management features are available. The default behavior in Power Management functions varies on systems, as described in Table 1–1.

To determine your system's architecture, use the `uname -m` command.

If you have Sun Microsystems™ hardware that is not described by this manual, refer to the *Sun Hardware Platform Guide* for this Solaris release. It may contain additional information about how Power Management software functions on your system.

TABLE 1–1 Power Management Features in Different SPARC Architectures

Power Management Features	sun4m	sun4u (Energy Star 2.0)	sun4u (Energy Star 3.0)	Servers
Display PM Available	Yes	Yes	Yes	Yes
Display PM by Default	Yes	Yes	Yes	Yes
Device PM Available	No	No	Yes	No
Device PM by Default	N/A	N/A	Yes	N/A
Suspend-Resume Available	Yes	Yes	Yes	No
Suspend-Resume by Default	No	Yes	No	N/A

TABLE 1–1 Power Management Features in Different SPARC Architectures *(continued)*

Power Management Features	sun4m	sun4u (Energy Star 2.0)	sun4u (Energy Star 3.0)	Servers
AutoShutDown Available	No	Yes	Yes	No
AutoWakeup by Default	N/A	Yes	No	N/A

Note - The SPARCstation™ Voyager is a sun4m-architecture system, but it is not supported in this Solaris release.

Power Management Software

In most cases, the default Power Management settings should suffice. If you would like to change them, however, you can do so through Dtpower, the Power Management software.

Dtpower Software

Dtpower launches a graphical user interface (GUI) that allows you change your power saving scheme, or to designate periods of inactivity after which the devices (including the monitor and disk drives) and the system will go into a power saving mode.

You can also use the Dtpower GUI to set the time of day to activate the Suspend-Resume feature (called *AutoShutdown* when configured through Dtpower). For example, if you want the AutoShutdown feature to activate only after your regular work hours. On sun4u-architecture workstations, you can also activate the AutoWakeup feature of the Dtpower software, which will power on the system at a specific time following an AutoShutdown.

Power Saving Schemes

The simplest way to manage your system power is by selecting one of three power-saving schemes offered by the Dtpower program:

- Standard — Power management for all capable devices

- Minimal — Power management for monitors only
- Disabled — No power management

In addition to these three schemes, you can also create a customized power scheme, which is discussed in Chapter 3.

CHAPTER 2

Basic Dtpower Settings and Configurations

This chapter describes the Dtpower GUI and its conventions. It also explains the preset power-saving schemes for Dtpower.

Accessing Dtpower

In previous releases, it was necessary to start the Dtpower software as superuser to edit the configurations. In this release, the program can be started in a number of ways, all of which allow you to change the configurations.

Note - If you are unable to access Dtpower for editing purposes, it may be because you do not have the correct permissions. See the `dtpower(1M)` man page for details.

If Dtpower is already running, it may appear on your desktop as this icon:

Figure 2–1 The Dtpower Icon

▼ To Start Dtpower Through the CDE Workspace

1. **On the CDE desktop, hold down the menu button on your mouse.**
2. **From the pull-down list, select Tools.**
3. **From the pull-down list, select Power Manager.**

▼ To Start Dtpower From the Applications Manager

1. **From the front panel on the CDE desktop, select Applications Manager.**
2. **From Applications Manager, select Desktop_App.**
3. **From Desktop_App, select Power Manager.**

▼ To Start Dtpower From the Command Line

1. **Start Dtpower:**

```
# /usr/dt/bin/dtpower &
```

Note - Due to system initialization, Dtpower can take some time to launch.

Overview of the Dtpower GUI

Basic Dtpower Window Controls

Every Dtpower window has one or more of the following buttons:

- **A triangle** indicates a pull-down menu. In the Figure 2–2, the Current Power Saving Scheme box can be pulled down to reveal two additional levels of power management: Minimal and Disabled.
- **OK** puts into effect the settings currently displayed in the window.

- **Cancel** reverses settings to the state they were in when OK was previously selected (or to default values if this is the first time you have run Dtpower). Cancel, however, will not return to earlier values if you have already selected OK.
- **Help** displays the Dtpower Help window.
- **More** expands the window to reveal the full options for editing the idle time for the system, monitors, and disk drives.
- **Less** reduces the window to conceal the options revealed through the More button.
- **Edit** is located in the Quick Edit tab (see Figure 3–2). It opens a window in which you can configure the AutoShutdown and AutoWakeup options.

Figure 2–2 The Dtpower Basic Window

Power Saving Schemes

The simplest way to select a level of power management for your system is to choose one of the preset power saving schemes. The schemes appear in the Current Power Saving Scheme box in the Dtpower basic window. The default scheme is Standard, as shown in Figure 2–2.

The implementation of the power saving schemes depends on the architecture and the Energy Star capability of the hardware running Dtpower. The following sections describe the power-saving schemes that are available.

Power Schemes and Their Implementation

The implementation of the power schemes depends on the power saving capabilities of your hardware. In addition to the schemes described below, you can also modify any one of these schemes and save it as a Customized scheme. For more information on creating a customized power saving scheme, see Chapter 3.

Standard Scheme

The default Power Management settings of your hardware determine the implementation of the Standard scheme. (To determine your system's default settings, see Chapter 1.) SPARC platforms that are Energy Star 3.0 compatible, for example, reduce power consumption by entering a power-saving mode for all devices.

Minimal Scheme

Manages power for monitors only. The monitor goes into power-saving mode after 30 minutes of idleness; no other devices are power managed.

Disabled Scheme

No power management. None of the components of the system are power managed.

▼ To Select a Power-Saving Scheme

1. **Start Dtpower.**
   This launches the Dtpower basic window.

2. **From the pull-down list in the Current Power Saving Scheme box, choose a scheme.**

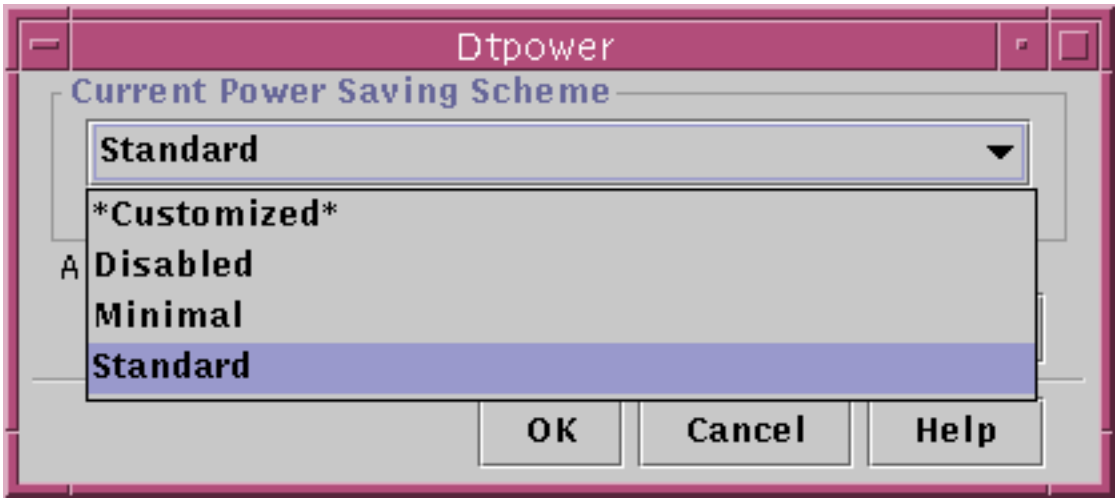

Figure 2–3 Pulldown List of Power Saving Schemes

3. Click OK.

Note - Some schemes in the pull-down list may be grayed out; you may be unable to select them because you do not have the correct permissions.

CHAPTER 3

Customizing Power Schemes

This chapter explains how you can create a customized power scheme, overriding the schemes that come preset in the Dtpower software.

You cannot overwrite the schemes provided by the system, but you can create a customized scheme. When you change a system-shipped scheme, a new scheme called “Customized” is created. When you edit another scheme, that first Customized scheme is overwritten by the new one. Thus, only one customized scheme can be saved at any time.

The Customized scheme remains the default scheme even if you reboot your system. But it is temporary in that it only remains in the system until you select one of the three preset schemes. Once you do that, the customized scheme is deleted and removed from the pull-down list of available schemes.

Power Management of Overall System

The system idle time defines the length of time for which the CPU and the devices connected to your system must be idle before they power down. Although the GUI can be used to assign only one idle time for all devices and the CPU, the idle time of each device is measured separately. If a system has two external hard drives, for example, and you are only using one of them, the second will go to power-saving mode after 30 minutes of idleness. The first will go to the power-saving mode separately, after it has been idle for 30 minutes.

For information on configuring a different idle time for each device, refer to the `power.conf(4)` man page.

▼ To Change System Power Management

1. **Start Dtpower.**
   This launches the Dtpower basic window:

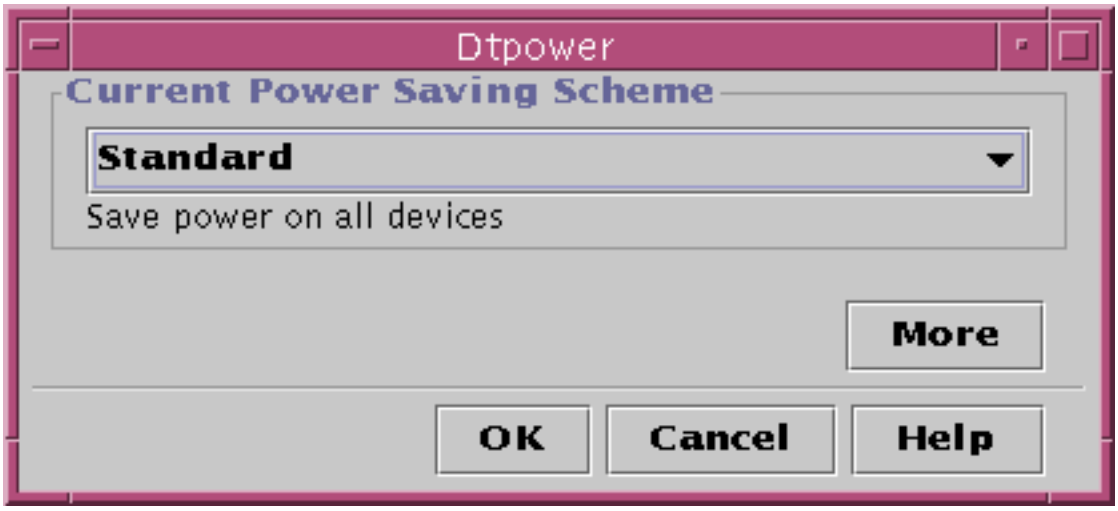

Figure 3–1 The Dtpower Basic Window

2. **In the Dtpower basic window, select More.**
   The Quick Edit tab is displayed.

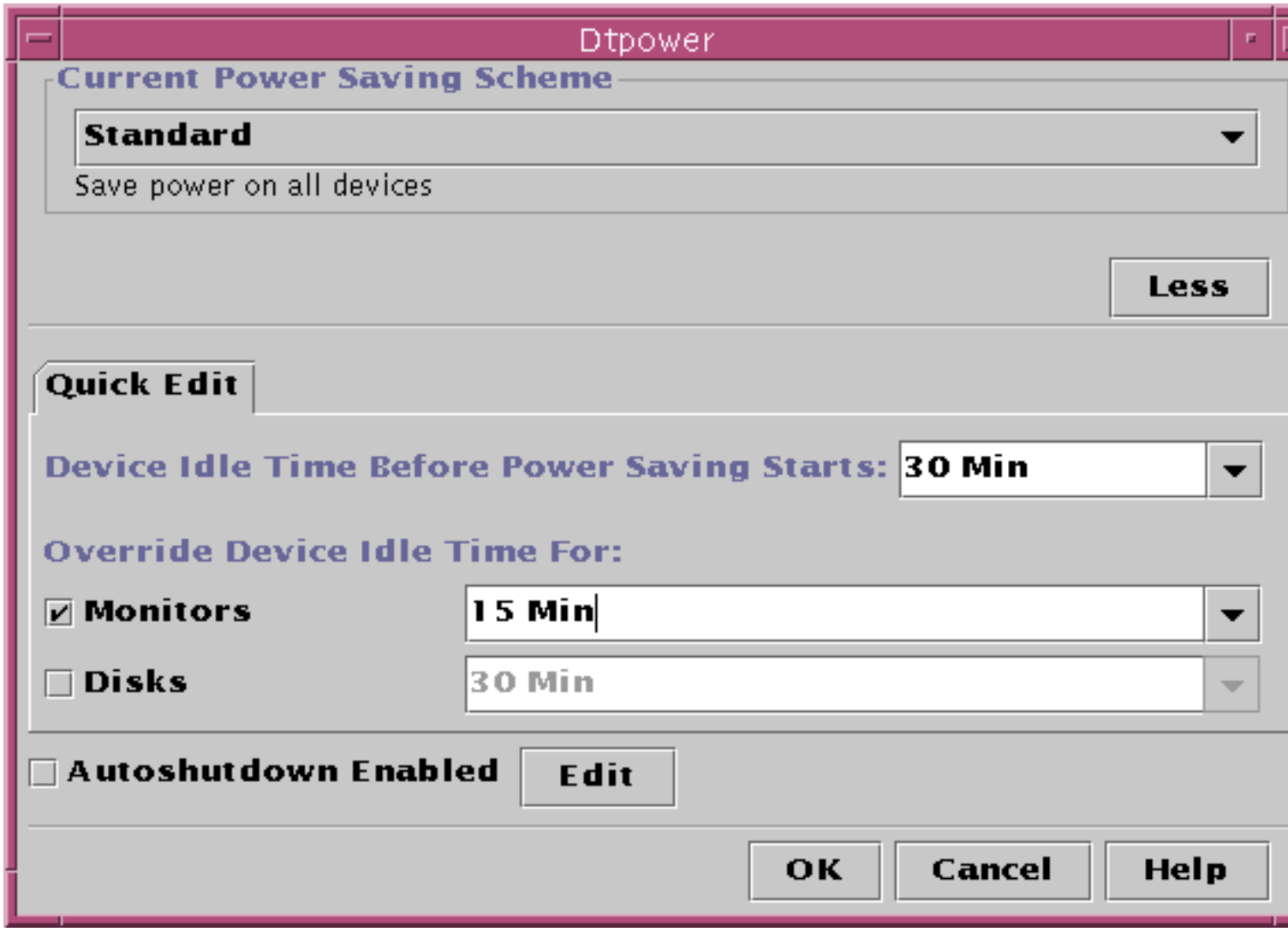

Figure 3–2 Quick Edit Tab

3. **From the pull-down list for Default System Idle Time, choose the amount of time you want all the devices to be idle before powering down.**

   Or you can type in the system idle time.

Power Management of Monitors

You can override the monitor power management from the overall system power management through the Dtpower GUI. When you change the idle time for monitor power, the idle time for all other devices and the system remains as it appears in the Default System Idle Time box; only the idle time for the monitor power changes.

When the screen goes blank, some monitors can power down, and then power up when you use the computer again. Other monitors will only blank the screen but not power down.

Power management of workstations that have two monitors (sometimes called a "double-headed system") is also handled through Dtpower. In such a case, both monitors receive the same idle time setting.

Note - In some past versions of Solaris operating environment, power management for monitors was handled through your windowing system's screen-saver options, rather than through the Dtpower program. That is no longer the case. Power management for the monitor, disk drive, and system power are now all handled uniformly through the Dtpower program.

▼ To Change Monitor Power Management

1. **Start Dtpower.**
   This launches the Dtpower basic window.

2. **In the Dtpower basic window, select More.**
   The Quick Edit tab is displayed.

3. **Check the Monitors - Sleep After Idling For button.**
   The pull-down list for the monitors' idle time becomes active.

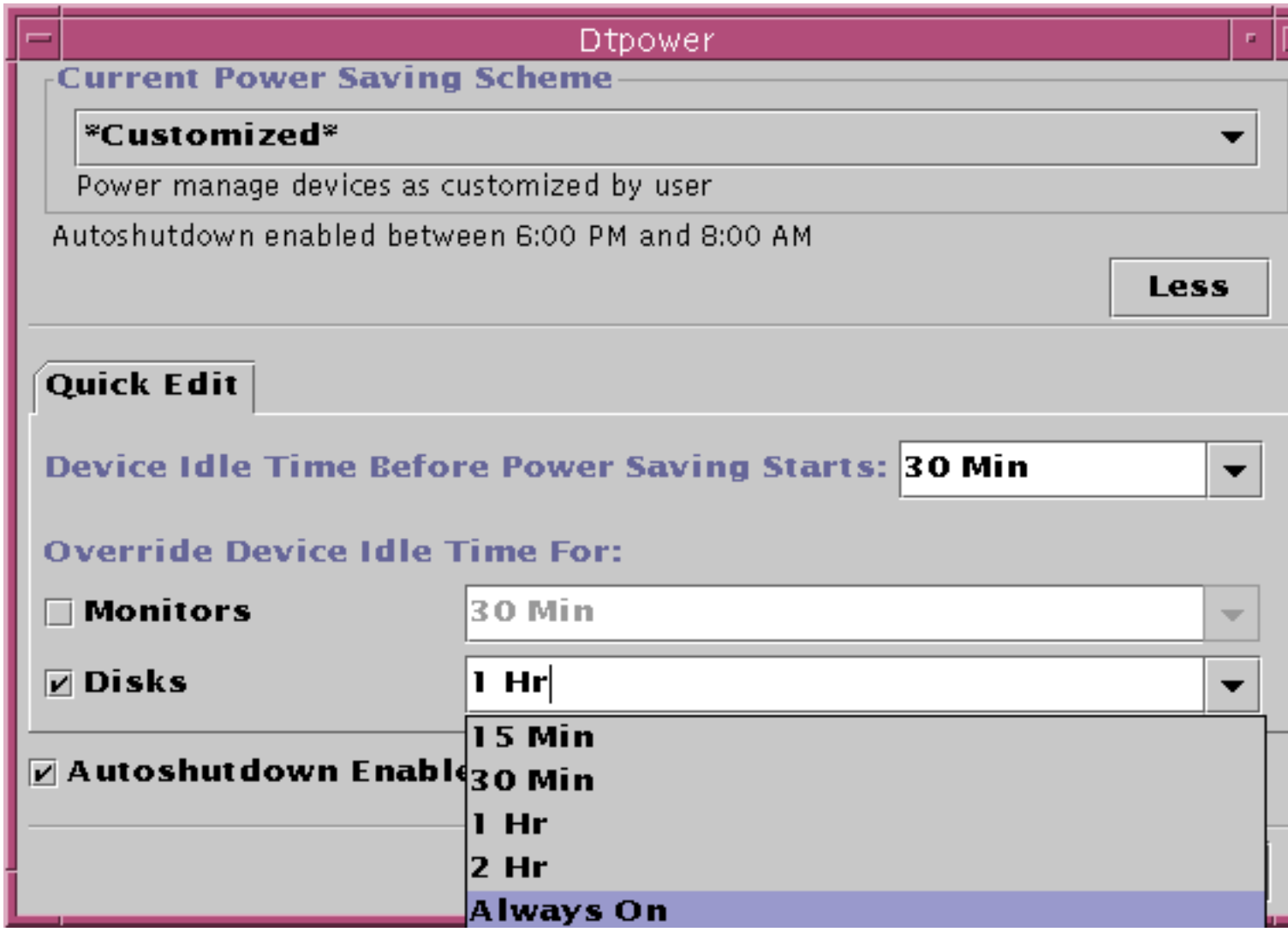

Figure 3–3 Pull-Down List for Disks Idle Time

4. Either choose a time from the pull-down list of idle times or enter a unique value.

You must leave a blank space between the number you enter and the units. Abbreviate the units to `Sec`, `Min`, or `Hr`, as appropriate. Decimal values are accepted. For example, if you enter `1.5 Hr`, the display idle time will be set to 90 minutes.

If you enter a new value, it is added to the list and will be available the next time you use the pull-down list. The value will be displayed in the format that you entered it in the edit box.

5. **Click OK.**

▼ To Reactivate the Monitor

1. **Move the mouse or press any key.**

This restores the power to the monitor, but you may find that your screen is locked. The screen lock option is set through the Style Manager in CDE. Unlike in previous versions of the Power Management software, the screen lock is now completely independent of the Power Management software. If your screen is locked, enter your password to return to the desktop.

Power Management of Disk Drives

You can override the power management of disk drives just as you can for monitors. When you change the idle time for disk drives, the idle time for all other devices and the system remains unchanged; only the setting for the disks' power changes. All disk drives connected to the system receive the same idle time.

For information on setting a different idle time for each disk drive, refer to the `power.conf(4)` man page.

▼ To Change Disk Drive Power Management

1. **Start Dtpower.**
   This launches the Dtpower basic window.

2. **In the Dtpower basic window, select More.**
   The Quick Edit tab is displayed.

3. **Check the Disk Drives - Sleep After Idling For button.**
   The corresponding pull-down list for idle time becomes active.

4. **Either choose a time from the pull-down list of idle times or enter a unique value.**

   Leave a blank space between the number you enter and units. Abbreviate the units to `Sec`, `Min`, or `Hr`, as appropriate. Decimal values are accepted. For example, if you enter `1.5 Hr`, the disk drive idle time is set to 90 minutes.

   If you enter a new value, it is added to the list, and will be available the next time you use the pull-down list. The value will be displayed the way you entered it in the edit box.

5. **Click OK.**

CHAPTER 4

Using the Suspend-Resume Feature

This chapter discusses the issues to consider when choosing to use the Suspend-Resume feature. It describes how to use the Suspend-Resume features to manually shut down your system and start it up again in the same working state. It also explains how to use the Dtpower program to manage system power, such as to specify when you want the desktop system to shut down automatically. It describes how to activate or turn off the Suspend-Resume feature.

This chapter points out the few differences in how the Dtpower program operates on sun4m-architecture desktop machines (such as the SPARCstation™ 20) and on sun4u-architecture desktop machines (such as the Sun Ultra™ 1).

Note - 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 more information, see the `power.conf(4)` man page.

Choosing to Use Suspend-Resume

Powering off a desktop system may interfere with some operations that involve that machine. This section presents some guidelines to take into account before deciding when to use system Power Management features on a desktop machine.

Electronic Mail Issues

Mail is not sent to any mail spool file on a machine while the machine 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 are bounced back to the sender.

Remote Login Issues

While your machine is suspended, you cannot access it by remote dial-in. That is, you cannot use `rlogin(1)` to connect to a machine while that machine is suspended.

Networked Software Issues

The Suspend-Resume feature may have an impact on a networked application. A networked program may fail if it is not resilient when a peer system is suspended and does not respond to network traffic.

One example of this is when you run an Xhosted application from one system and display it on another system. If the Power Management software suspends the latter system, the application software may fail.

Solstice AutoClient Issues

Do not use Suspend-Resume features on a machine that uses Solstice™ AutoClient™ software.

ATM Issues

The Power Management software is not supported on SunATM™ devices. The ATM protocol is connection oriented, which means calls must be established between two endpoints (such as workstations) before data can be transferred. Each end of the call must maintain the connection actively, so neither end of an ATM connection can use the Power Management software to suspend and, later, resume the connection.

Cron Job Issues

Operations specified in a `cron` file do not run during the time a machine is suspended.

When a system resumes, cron jobs scheduled to run during the time the system was suspended with the Power Management software are handled in the following way:

- The first cron job (the one scheduled to run earliest during the time the system was suspended) is started as soon as the system resumes.
- The second and subsequent cron jobs that might have run during the time the system was suspended are not run at all.

Normally, the `cron` command identifies the next job to run and calculates the interval to wait until it is time to run that job. When a system resumes, the `cron` command calculates the interval until the first job has expired; then this already-queued cron job is run. The cron process then rechecks its queue of jobs. It only considers jobs whose execution time has not yet passed, so any additional jobs whose run time fell during the time the system was suspended are not run.

Calendar Manager Issues

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

Thermal Stress Issues

The goal of the Power Management software 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.

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

Despite this feature, you can 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.

Suspending and Resuming Your System Manually

The Power Management software includes a timesaving feature called Suspend-Resume. This feature is used by default through the AutoShutdown and AutoWakeup features of the Dtpower program. You also can Suspend and Resume your system whenever you choose by following the procedures in this section.

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. When you power on the system, the saved workspace is restored.

You can leave your system suspended and powered off for an indefinite length of time without losing data. However, there are some outside operations (such as receiving mail) that may be affected while your system is suspended. Before you use the Suspend-Resume feature, be sure to read “Choosing to Use Suspend-Resume” on page 27.

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

Suspending Your System

You can suspend your system automatically using the AutoShutdown feature in the Power Management software. To suspend your system manually, follow the instructions in this section.

Suspend allows you to do the following without losing the current state of your system:

- Move your system from one location to another.
- Power off your system to conserve energy.

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 operations such as the following to finish:

- Audio activity
- Floppy disk activity

- Tape activity
- ISDN activity
- Synchronous TTY activity

Initiating a Suspend and a subsequent Resume usually requires less than a minute. You can initiate Suspend in several ways:

- Use the power key, then respond to a prompt.
- Use the Shift and Power keys to Suspend without a further prompt.
- Use the standby switch available on the front of systems such as the Sun Ultra 5 and Sun Ultra 10.
- Use the CDE desktop Workspace menu.
- Use the `sys-suspend` command.

▼ To Suspend Your System Using the Keyboard

1. **Press the Power key.**

   For examples of the location of the Power key, see Figure 4–1 and Figure 4–2.

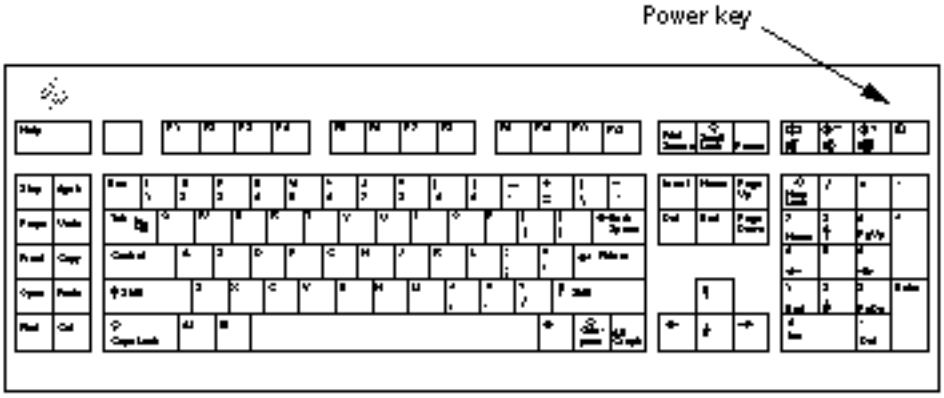

Figure 4–1 Example of Power Key Location on Sun Type 5 and Type 6 Keyboards

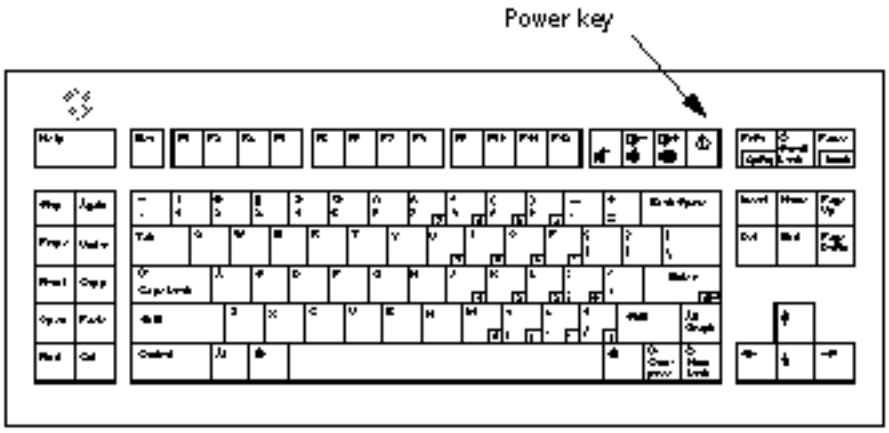

Figure 4–2 Power Key Location on Sun Compact 1Keyboard

After you press the Power key, the confirmation window shown in Figure 4–3 is displayed.

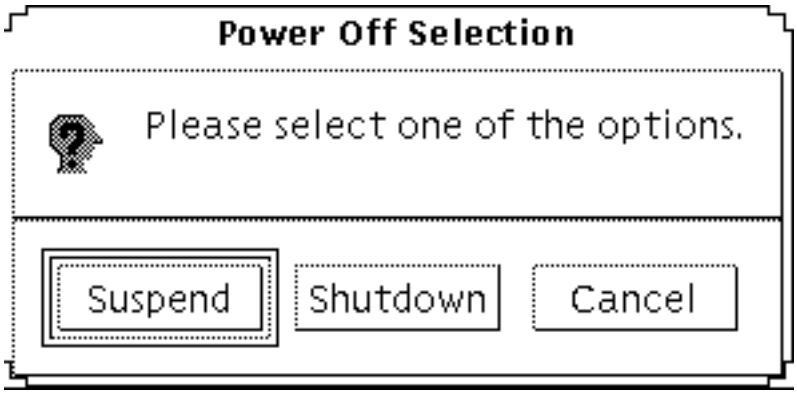

Figure 4–3 Default Confirmation Window for Power Key Suspend

2. **Select Suspend in the confirmation window.**

   Suspend saves the state of the system to disk, enabling you to return later to the current system environment.

   Shutdown syncs the disks to a neutral state and effectively shuts down the operating system. This is equivalent to running the `shutdown(1M)` command.

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 Immediately Suspend Your System Using the Keyboard

1. **Press the Shift and the Power key at the same time.**

   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 Disable the Power Key

1. **As root, edit the /usr/openwin/lib/speckeysd.map file**

```
# vi /usr/openwin/lib/speckeysd.map
```

2. **comment out the two lines starting "SunPower" by putting a "#" as the first character in the line.**

```
#SunPowerSwitch                 -       $OPENWINHOME/bin/sys-suspen
#SunPowerSwitchShift            -       $OPENWINHOME/bin/sys-suspend -n
```

3. **Save the edited file.**

4. **Shut down and restart the system.**

▼ To Suspend Your System Using the Standby Switch

Some systems, such as the Sun Ultra 5 and Sun Ultra 10, have a standby switch on the front of the system.

1. **Press the standby switch while you are in a windowing environment.**

Caution - If you are not in a windowing environment, pressing the standby switch will immediately shut down the system.

In a windowing environment, the confirmation window shown in Figure 4–4 is displayed.

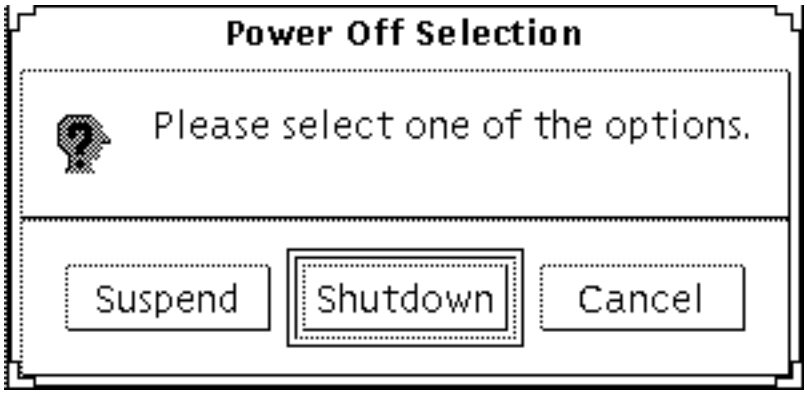

Figure 4–4 Default Confirmation Window for Standby Switch

2. **Select Suspend in the confirmation window.**

   Suspend saves the state of the system to disk, enabling you to return to the current system environment.

   Shutdown syncs the disks to a neutral state and effectively shuts down the operating system. This is equivalent to running the `shutdown(1M)` command.

   In the window for the standby switch, Shutdown is the default. In the similar window that appears when you press the power key, Suspend is the default.

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 Suspend Your System Using CDE

1. **Place your cursor in the workspace and hold down the menu button.**
   The Workspace menu is displayed.

2. **Select Suspend System from the Workspace menu.**
   The Suspend confirmation window is displayed, as shown in Figure 4–3.

3. **Select Suspend in the confirmation window.**

4. **Wait for the system to power off.**

5. **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 windowing system, such as OpenWindows or CDE, for the `sys-suspend` shell command to work, nor do you need to be superuser.

---

1. **At the prompt, initiate the system suspend process:**

```
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 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 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.

3. **Enter your password to unlock the system.**
   Whenever the system is suspended, it is automatically locked.

System AutoShutdown and AutoWakeup Controls

Using the Dtpower program, you can specify times for your system to shut down automatically. This feature is called AutoShutdown. If you have a sun4u desktop machine, you can also set your system to power on automatically at a specified time. This feature is called AutoWakeup.

Note - Be sure to read “Choosing to Use Suspend-Resume” on page 27 before changing the AutoShutdown settings.

AutoShutdown uses the Suspend feature to automatically power off your system. When the system powers up again, it resumes in the state in which it was suspended.

Through the Dtpower window, you can activate or deactivate the AutoShutdown and AutoWakeup features. You can also specify the following values:

- The number of minutes of idle time before AutoShutdown attempts to suspend the system
- The start and finish times when AutoShutdown can occur during each day. (If you specify the same time for both start and finish, AutoShutdown can occur at any time of day. See Figure 4–5.)
- The time of day when the system will automatically power on and resume (AutoWakeup) after being suspended by AutoShutdown (available on sun4u desktop systems only).

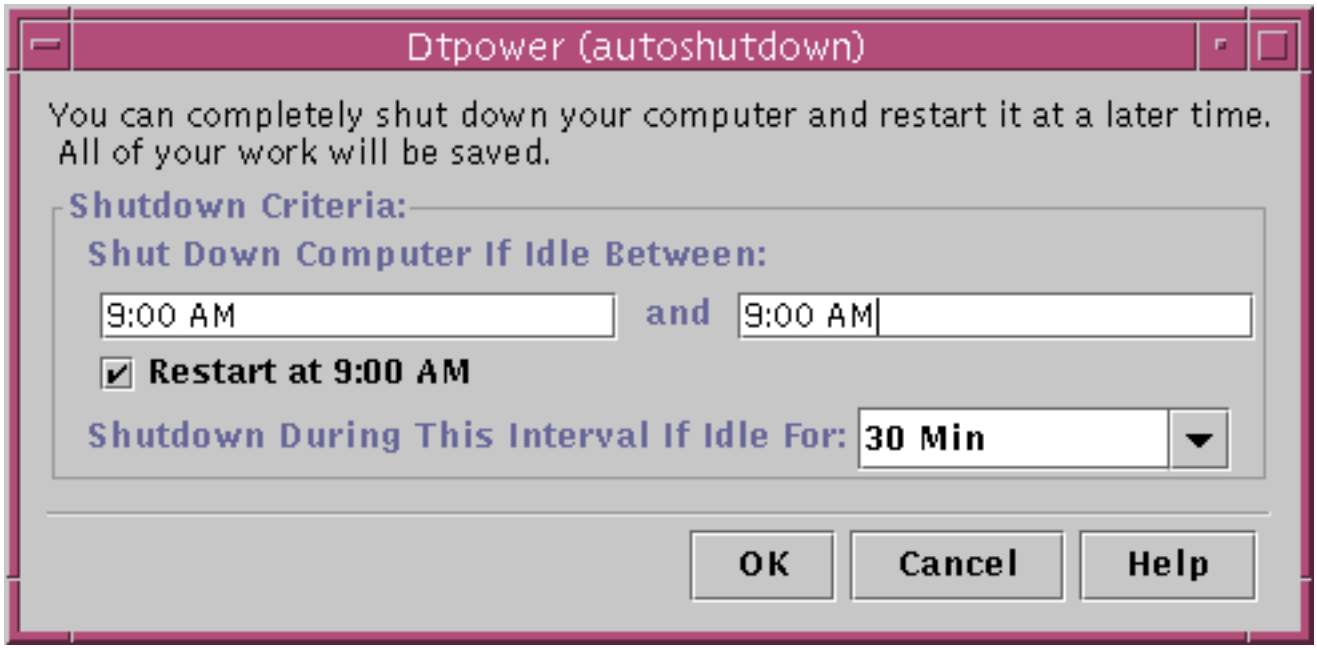

Figure 4–5 Autoshutdown Configuration for All Day

Note - AutoWakeup does not occur after you suspend a system manually; it can occur only after an AutoShutdown.

▼ To Set an Idle Time for AutoShutdown

1. **Start Dtpower.**

   Note - Consecutive executions of AutoShutdown do not occur less than five minutes apart, even if the idle time setting is under five minutes.

   ---

2. **In the Dtpower basic window, click More.**
   The window expands to show the Quick Edit tab.

3. **In the Quick Edit tab, check Enable Autoshutdown.**

4. **Click Edit.**
   The AutoShutdown window is displayed.

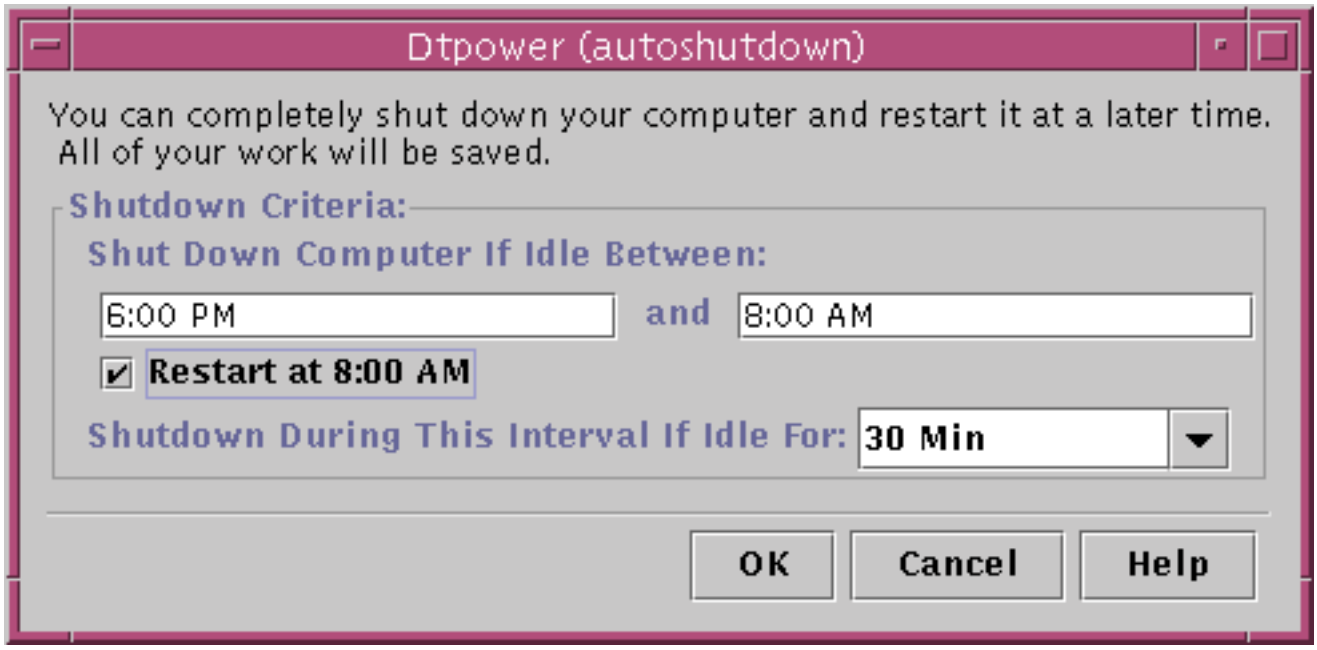

Figure 4–6 Autoshutdown Window

5. **Enter the time you want the AutoShutdown feature to start to be active.**

6. **Enter the time you want the AutoShutdown feature to cease being active.**

7. **In the numerical box for Shutdown During This Interval If Idle for, enter the duration for which the computer must be idle before shutting down.**

   In Figure 4–6, the AutoShutdown will occur after 30 minutes of idle time between the hours of 6:00 p.m. and 8:00 a.m.

8. **Click OK when all the settings you want are displayed.**

   If you want to reject the displayed settings, select Cancel; the currently active settings will be displayed in the window.

▼ To Disable Autoshutdown

1. **Start Dtpower.**

2. **In the Dtpower basic window, click More.**

The window expands to show the Quick Edit tab.

3. **In the Quick Edit tab, uncheck Enable Autoshutdown.**

4. **Click OK.**

▼ To Enable AutoWakeup

Note - The AutoWakeup feature is available only on sun4u desktop systems.

---

1. **Start Dtpower.**

2. **In the Dtpower basic window, click More.**
   This expands the window to reveal the Quick Edit tab.

3. **In the Quick Edit tab, check Enable Autoshutdown.**

4. **Click Edit.**
   The AutoShutdown window is displayed.

5. **Set the idle time for AutoShutdown.**
   See “To Set an Idle Time for AutoShutdown” on page 37.

6. **Check the Restart at <*time*> button.**

The time the computer will restart is the second time you have specified for Autoshutdown.

▼ To Disable AutoWakeup

1. **Start Dtpower.**

2. **In the Dtpower basic window, click More.**
   This expands the window to reveal the Quick Edit tab

3. **In the Quick Edit tab, uncheck Enable Autoshutdown.**

4. **Click Edit.**

The AutoShutdown window is displayed.

5. **Uncheck the Restart at <*time*> button.**

▼ To Exit Dtpower

1. **Click OK to activate the new settings you made in the Dtpower window.**
   The Dtpower window closes.

Troubleshooting Suspend-Resume Problems

The following section describes solutions to problems that may occur with Suspend-Resume.

Power Key Problems

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

▼ To Respond When the Power Key Does Not Suspend the System

1. **Verify that the key processing daemon is present:**

```
% ps -eaf | grep speckeysd
```

   If the resulting message does not list `/usr/openwin/bin/speckeysd`, you will need to start the key processing daemon.

2. **Become superuser and start the key processing daemon (if necessary):**

```
% /usr/openwin/bin/speckeysd
```

Suspend Failures

When the system fails to suspend, an alert appears. The exact message within the pop-up window may vary, depending on the cause of the problem, but the Suspend Failed window will appear similar to the following figure.

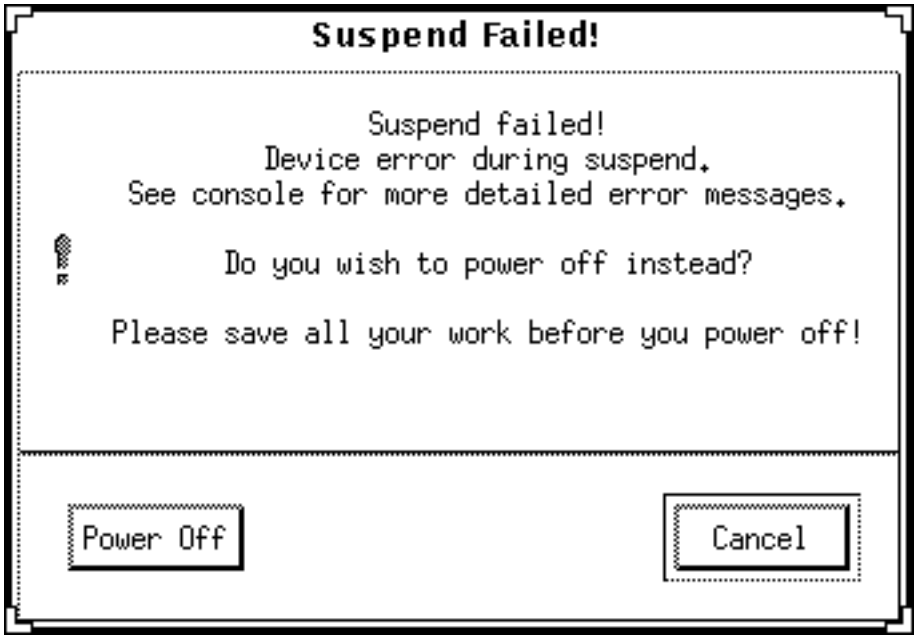

Figure 4–7 Suspend Failed Pop-up Window

When any Suspend Failed window appears, click either of the buttons at the bottom of the window:

- Power Off turns off power *without* preserving the current operating state, as a suspend operation usually does.
- Cancel cancels the suspend request, and the hardware continues to be powered on.

The following sections discuss specific “Suspend Failed” messages.

Device Suspend Failure

If a device fails to suspend, a Suspend Failed pop-up window is displayed that 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 the corrective action described below before retrying suspend again.

2. **Check for more information in the console window in the workspace.**

   An unsupported device or a device performing nonresumable activity may be the cause of this problem.

   If the device specified by the console message is performing a nonresumable activity, stop the activity and try suspend again, as described in Step 1.

   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.**

   Before you try to suspend again, attempt to unload the device driver by doing these steps:

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

   b. **Unload that module**:

   ```
   modunload -i module_id
   ```

   You might not be able to unload a driver for one of these reasons:

   - There is no detach support in the code.
   - Another driver must be unloaded first, such as `audio(7I)` and `dbri(7D)`.
   - The device is actually in use and busy.

   In such a case, contact your system administrator.

4. **Try Suspend again.**
   - If Suspend succeeds, the system saves your activities and the system powers off successfully.
   - If Suspend does not succeed, the alert pop-up window is displayed again. In this 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 the following figure:

Figure 4–8 Power Off Failed Pop-up 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.

   Also, some sun4m-architecture systems drop to an OpenBoot™ PROM prompt after a suspend operation, because those systems do not support software power off.

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 features, if one is available from your manufacturer.

Process Suspend Failure

If a process fails to suspend, a Suspend Failed pop-up window is displayed that 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.**

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

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 you can correct it 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 saves your activities and the system powers 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.

Shortage of Disk Space

When your system suspends, it creates a statefile to preserve the current state of your system. If the file system containing the statefile is full, a Suspend Failed pop-up window is displayed that includes the following message:

```
Suspend requires more disk space for statefile.
```

Perform the following 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 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 available. Clean up a partition before you try suspend again. Another solution is to change the location of the statefile to a file system with sufficient space, as described in the `power.conf(4)` man page.

   Contact your system administrator for assistance, if necessary.

3. **Try Suspend again.**

   - If Suspend succeeds, the system saves your activities and the system powers 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.

Abnormal Conditions

If an abnormal condition occurs, a Suspend Failed pop-up window is displayed that includes the following message:

```
Abnormal condition during suspend.
```

Perform the following 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 saves your activities and the system powers off.
   - If Suspend does not succeed, the alert pop-up window is displayed again. In this case, continue with the next step.

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

4. **Select Power Off.**
   Remember, your data won't be saved unless you have done so manually.
   When you power on again, your system automatically reboots.

Disabling the Screen Lock

After a Resume, the system's screen lock is invoked by default. To disable the screen lock before you use the power key to Suspend, use the following procedure.

Note - You cannot disable screen locking that is put into effect by AutoShutdown. This is a security feature. It ensures that only someone who knows your password can get access to your work session when the system resumes.

▼ To Disable the Screen Lock After Using the Power Key to Suspend

1. **Modify the** `speckeysd.map` **file to add the** `-x` **flag to the** `sys-suspend` **entry.**
   For more information, see the man page for `speckeysd.map(4)`.

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

2. **Exit the current windowing session and restart.**

   In place of this step, you may also kill the `speckeysd` daemon and then restart the daemon.

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