



# Sun Fire™ T1000 Server System Administration Guide

---

Sun Microsystems, Inc.  
www.sun.com

Part No. 819-3249-10  
January 2006, Revision A

Submit comments about this document at: <http://www.sun.com/hwdocs/feedback>

Copyright 2006 Sun Microsystems, Inc., 4150 Network Circle, Santa Clara, California 95054, U.S.A. All rights reserved.

Sun Microsystems, Inc. has intellectual property rights relating to technology that is described in this document. In particular, and without limitation, these intellectual property rights may include one or more of the U.S. patents listed at <http://www.sun.com/patents> and one or more additional patents or pending patent applications in the U.S. and in other countries.

This document and the product to which it pertains are distributed under licenses restricting their use, copying, distribution, and decompilation. No part of the product or of this document may be reproduced in any form by any means without prior written authorization of Sun and its licensors, if any.

Third-party software, including font technology, is copyrighted and licensed from Sun suppliers.

Parts of the product may be derived from Berkeley BSD systems, licensed from the University of California. UNIX is a registered trademark in the U.S. and in other countries, exclusively licensed through X/Open Company, Ltd.

Sun, Sun Microsystems, Sun Fire, the Sun logo, AnswerBook2, docs.sun.com, Sun StorEdge, OpenBoot, and Solaris are trademarks or registered trademarks of Sun Microsystems, Inc. in the U.S. and in other countries.

All SPARC trademarks are used under license and are trademarks or registered trademarks of SPARC International, Inc. in the U.S. and in other countries. Products bearing SPARC trademarks are based upon an architecture developed by Sun Microsystems, Inc.

The OPEN LOOK and Sun™ Graphical User Interface was developed by Sun Microsystems, Inc. for its users and licensees. Sun acknowledges the pioneering efforts of Xerox in researching and developing the concept of visual or graphical user interfaces for the computer industry. Sun holds a non-exclusive license from Xerox to the Xerox Graphical User Interface, which license also covers Sun's licensees who implement OPEN LOOK GUIs and otherwise comply with Sun's written license agreements.

U.S. Government Rights—Commercial use. Government users are subject to the Sun Microsystems, Inc. standard license agreement and applicable provisions of the FAR and its supplements.

DOCUMENTATION IS PROVIDED "AS IS" AND ALL EXPRESS OR IMPLIED CONDITIONS, REPRESENTATIONS AND WARRANTIES, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR NON-INFRINGEMENT, ARE DISCLAIMED, EXCEPT TO THE EXTENT THAT SUCH DISCLAIMERS ARE HELD TO BE LEGALLY INVALID.

---

Copyright 2006 Sun Microsystems, Inc., 4150 Network Circle, Santa Clara, Californie 95054, Etats-Unis. Tous droits réservés.

Sun Microsystems, Inc. a les droits de propriété intellectuels relatants à la technologie qui est décrit dans ce document. En particulier, et sans la limitation, ces droits de propriété intellectuels peuvent inclure un ou plus des brevets américains énumérés à <http://www.sun.com/patents> et un ou les brevets plus supplémentaires ou les applications de brevet en attente dans les Etats-Unis et dans les autres pays.

Ce produit ou document est protégé par un copyright et distribué avec des licences qui en restreignent l'utilisation, la copie, la distribution, et la décompilation. Aucune partie de ce produit ou document ne peut être reproduite sous aucune forme, par quelque moyen que ce soit, sans l'autorisation préalable et écrite de Sun et de ses bailleurs de licence, s'il y en a.

Le logiciel détenu par des tiers, et qui comprend la technologie relative aux polices de caractères, est protégé par un copyright et licencié par des fournisseurs de Sun.

Des parties de ce produit pourront être dérivées des systèmes Berkeley BSD licenciés par l'Université de Californie. UNIX est une marque déposée aux Etats-Unis et dans d'autres pays et licenciée exclusivement par X/Open Company, Ltd.

Sun, Sun Microsystems, Sun Fire, le logo Sun, AnswerBook2, docs.sun.com, Sun StorEdge, OpenBoot, et Solaris sont des marques de fabrique ou des marques déposées de Sun Microsystems, Inc. aux Etats-Unis et dans d'autres pays.

Toutes les marques SPARC sont utilisées sous licence et sont des marques de fabrique ou des marques déposées de SPARC International, Inc. aux Etats-Unis et dans d'autres pays. Les produits portant les marques SPARC sont basés sur une architecture développée par Sun Microsystems, Inc.

L'interface d'utilisation graphique OPEN LOOK et Sun™ a été développée par Sun Microsystems, Inc. pour ses utilisateurs et licenciés. Sun reconnaît les efforts de pionniers de Xerox pour la recherche et le développement du concept des interfaces d'utilisation visuelle ou graphique pour l'industrie de l'informatique. Sun détient une licence non exclusive de Xerox sur l'interface d'utilisation graphique Xerox, cette licence couvrant également les licenciées de Sun qui mettent en place l'interface d'utilisation graphique OPEN LOOK et qui en outre se conforment aux licences écrites de Sun.

LA DOCUMENTATION EST FOURNIE "EN L'ÉTAT" ET TOUTES AUTRES CONDITIONS, DECLARATIONS ET GARANTIES EXPRESSES OU TACITES SONT FORMELLEMENT EXCLUES, DANS LA MESURE AUTORISEE PAR LA LOI APPLICABLE, Y COMPRIS NOTAMMENT TOUTE GARANTIE IMPLICITE RELATIVE A LA QUALITE MARCHANDE, A L'APTITUDE A UNE UTILISATION PARTICULIERE OU A L'ABSENCE DE CONTREFAÇON.



Please  
Recycle



Adobe PostScript

# Contents

---

**Preface** xi

**1. Configuring the System Console** 1

Communicating With the System 1

    What the System Console Does 3

    Using the System Console 3

        Default System Console Connection Through the Serial Management and  
        Network Management Ports 4

About the `sc>` Prompt 6

    Access Through Multiple Controller Sessions 6

    Reaching the `sc>` Prompt 7

OpenBoot `ok` Prompt 7

    Reaching the `ok` Prompt 8

        Graceful Shutdown 9

        ALOM System Controller `break` or `console` Command 9

        L1-A (Stop-A) Keys or Break Key 9

        Manual System Reset 10

    For More Information 10

    Getting to the `ok` Prompt 10

    ▼ To Get to the `ok` Prompt 11

Switching Between the ALOM System Controller and the System Console	12
Accessing the System Controller	13
Using the Serial Management Port	13
▼ To Use the Serial Management Port	14
Activating the Network Management Port	14
▼ To Activate the Network Management Port	15
Accessing the System Console Through a Terminal Server	16
▼ To Access The System Console Through a Terminal Server	16
Accessing the System Console Through a Tip Connection	18
▼ To Access the System Console Through the Tip Connection	18
Modifying the <code>/etc/remote</code> File	19
▼ To Modify the <code>/etc/remote</code> File	20
Accessing the System Console Through an Alphanumeric Terminal	21
▼ To Access the System Console Through an Alphanumeric Terminal	21
System Console OpenBoot Configuration Variable Settings	22
<b>2. Managing RAS Features and System Firmware</b>	<b>23</b>
ALOM System Controller	23
Logging In To the ALOM System Controller	24
▼ To Log In To the ALOM System Controller	25
▼ To View Environmental Information	25
Interpreting System LEDs	26
Controlling the Locator LED	27
Automatic System Recovery	28
Auto-Boot Options	29
Error Handling Summary	29
Reset Scenarios	30
Automatic System Recovery User Commands	31

Enabling and Disabling Automatic System Recovery	31
▼ To Enable Automatic System Recovery	32
▼ To Disable Automatic System Recovery	32
Obtaining Automatic System Recovery Information	33
Unconfiguring and Reconfiguring Devices	33
▼ To Unconfigure a Device Manually	34
▼ To Reconfigure a Device Manually	34
Displaying System Fault Information	35
▼ To Display System Fault Information	35
Multipathing Software	35
For More Information	36
Storing FRU Information	36
▼ To Store Information in Available FRU PROMs	36
<b>A. OpenBoot Configuration Variables</b>	<b>37</b>
<b>Index</b>	<b>41</b>



# Figures

---

- [FIGURE 1-1](#) Directing the System Console 4
- [FIGURE 1-2](#) Rear I/O panel of the chassis—SC Serial Management Port Is Default Console Connection 5
- [FIGURE 1-3](#) Separate System Console and System Controller Channels 12
- [FIGURE 1-4](#) Patch Panel Connection Between a Terminal Server and a Sun Fire T1000 Server 17
- [FIGURE 1-5](#) Tip Connection Between a Sun Fire T1000 Server and Another Sun System 18
- [FIGURE 2-1](#) LocatorButton on front of the Sun Fire T1000 Chassis 28





# Tables

---

<a href="#">TABLE 1-1</a>	Ways of Communicating With the System	2
<a href="#">TABLE 1-2</a>	Ways of Accessing the <code>ok</code> Prompt	11
<a href="#">TABLE 1-3</a>	Pin Crossovers for Connecting a Sun Fire T1000 Server to a Terminal Server	17
<a href="#">TABLE 1-4</a>	OpenBoot Configuration Variables That Affect the System Console	22
<a href="#">TABLE 2-1</a>	LED Behavior and Meaning	26
<a href="#">TABLE 2-2</a>	LED Behaviors with Assigned Meanings	26
<a href="#">TABLE 2-3</a>	Virtual Keyswitch Setting for Reset Scenario	31
<a href="#">TABLE 2-4</a>	ALOM Variable Settings for Reset Scenario	31
<a href="#">TABLE 2-5</a>	Device Identifiers and Devices	34
<a href="#">TABLE A-1</a>	OpenBoot Configuration Variables Stored on the System Configuration Card	37



# Preface

---

The *Sun Fire T1000 Server System Administration Guide* is written for experienced system administrators. It includes general descriptive information about the Sun Fire™ T1000 server and detailed instructions for configuring and administering the server. To use the information in this manual, you must have working knowledge of computer network concepts and terms, and advanced familiarity with the Solaris™ Operating System (Solaris OS).

---

## How This Book Is Organized

The *Sun Fire T1000 Server System Administration Guide* is divided into the following chapters:

- [Chapter 1](#) describes the system console and how to access it.
- [Chapter 2](#) describes the tools used to configure system firmware, including Sun™ Advanced Lights Out Manager (ALOM) CMT system controller environmental monitoring, automatic system recovery (ASR), and multipathing software. In addition, it describes how to unconfigure and reconfigure a device manually.

This manual also includes the following reference appendix:

- [Appendix A](#) provides a list of all OpenBoot™ configuration variables, and a short description of each.

---

# Using UNIX Commands

This document might not contain information on basic UNIX® commands and procedures such as shutting down the system, booting the system, and configuring devices. See the following for this information:

- Software documentation that you received with your system
- Solaris OS documentation, which is at:

<http://docs.sun.com>

---

## Shell Prompts

Shell	Prompt
C shell	<i>machine-name%</i>
C shell superuser	<i>machine-name#</i>
Bourne shell and Korn shell	\$
Bourne shell and Korn shell superuser	#

---

# Typographic Conventions

Typeface*	Meaning	Examples
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. % You have mail.
<b>AaBbCc123</b>	What you type, when contrasted with on-screen computer output	% <b>su</b> password:
<i>AaBbCc123</i>	Book titles, new words or terms, words to be emphasized. Replace command-line variables with real names or values.	Read Chapter 6 in the <i>User's Guide</i> . These are called <i>class</i> options. You <i>must</i> be superuser to do this. To delete a file, type <code>rm filename</code> .

\* The settings on your browser might differ from these settings.

## Related Documentation

Title	Description	Part Number
<i>Sun Fire T1000 Server Site Planning Guide</i>	Site planning information for the Sun Fire T1000 server	819-3749
<i>Sun Fire T1000 Server Product Notes</i>	Late breaking information about the server. The latest notes are posted at: <a href="http://www.sun.com/documentation">http://www.sun.com/documentation</a>	819-3246
<i>Sun Fire T1000 Server Getting Started Guide</i>	Information about where to find documentation to get your system installed and running quickly	819-3244
<i>Sun Fire T1000 Server Installation Guide</i>	Detailed rack mounting, cabling, power-on, and configuration information	819-3247
<i>Sun Fire T1000 Server System Administration Guide</i>	How to perform administrative tasks that are specific to the Sun Fire T1000 server	819-3249
<i>Sun Fire T1000 Server Service Manual</i>	How to run diagnostics to troubleshoot your server and how to remove and replace parts in the server	819-3248
<i>Advanced Lights Out Manager (ALOM) CMT v1.1 Guide</i>	How to use the Advanced Lights Out Manager (ALOM) software on the Sun Fire T1000 server	819-3250

---

## Accessing Sun Documentation

You can view, print, or purchase a broad selection of Sun documentation, including localized versions, at:

<http://www.sun.com/documentation>

---

## Third-Party Web Sites

Sun is not responsible for the availability of third-party web sites mentioned in this document. Sun does not endorse and is not responsible or liable for any content, advertising, products, or other materials that are available on or through such sites or resources. Sun will not be responsible or liable for any actual or alleged damage or loss caused by or in connection with the use of or reliance on any such content, goods, or services that are available on or through such sites or resources.

---

## Contacting Sun Technical Support

If you have technical questions about this product that are not answered in this document, go to:

<http://www.sun.com/service/contacting>

---

## Sun Welcomes Your Comments

Sun is interested in improving its documentation and welcomes your comments and suggestions. You can submit your comments by going to:

<http://www.sun.com/hwdocs/feedback>

Please include the title and part number of your document with your feedback:

*Sun Fire T1000 Server System Administration Guide*, part number 819-3249-10





# Configuring the System Console

---

This chapter explains what the system console is, describes the different ways of configuring it on a Sun Fire T1000 server, and helps you understand its relation to the system controller.

Topics covered in this chapter include:

- [“Communicating With the System” on page 1](#)
- [“About the `sc>` Prompt” on page 6](#)
- [“OpenBoot `ok` Prompt” on page 7](#)
- [“Switching Between the ALOM System Controller and the System Console” on page 12](#)
- [“Accessing the System Controller” on page 13](#)
- [“Activating the Network Management Port” on page 14](#)
- [“Accessing the System Console Through a Terminal Server” on page 16](#)
- [“Getting to the `ok` Prompt” on page 10](#)
- [“Accessing the System Console Through a `Tip` Connection” on page 18](#)
- [“Modifying the `/etc/remote` File” on page 19](#)
- [“Accessing the System Console Through an Alphanumeric Terminal” on page 21](#)
- [“System Console OpenBoot Configuration Variable Settings” on page 22](#)

---

## Communicating With the System

To install your system software or to diagnose problems, you need some way to interact at a low level with the system. The *system console* is Sun’s facility for doing this. You use the system console to view messages and issue commands. There can be only one system console per computer.

The serial management port (SERIAL MGT) is the default port for accessing the system console upon initial system installation. After installation, you can configure the system console to accept input from and send output to different devices. [TABLE 1-1](#) lists these devices and where they are discussed in the document.

**TABLE 1-1** Ways of Communicating With the System

Devices Available	During Installation	After Installation	Further Information
A terminal server attached to the serial management port (SERIAL MGT).	X	X	"Accessing the System Controller" on page 13
	X	X	"Accessing the System Console Through a Terminal Server" on page 16
	X	X	"System Console OpenBoot Configuration Variable Settings" on page 22
An alphanumeric terminal or similar device attached to the serial management port (SERIAL MGT).	X	X	"Accessing the System Controller" on page 13
	X	X	"Accessing the System Console Through an Alphanumeric Terminal" on page 21
	X	X	"System Console OpenBoot Configuration Variable Settings" on page 22
A Tip line attached to the serial management port (SERIAL MGT).	X	X	"Accessing the System Controller" on page 13
	X	X	"Accessing the System Console Through a Tip Connection" on page 18
		X	"Modifying the /etc/remote File" on page 19

**TABLE 1-1** Ways of Communicating With the System (Continued)

Devices Available	During Installation	After Installation	Further Information
	X	X	<a href="#">“System Console OpenBoot Configuration Variable Settings” on page 22</a>
An Ethernet line connected to the network management port (NET MGT).		X	<a href="#">“Activating the Network Management Port” on page 14</a>

## What the System Console Does

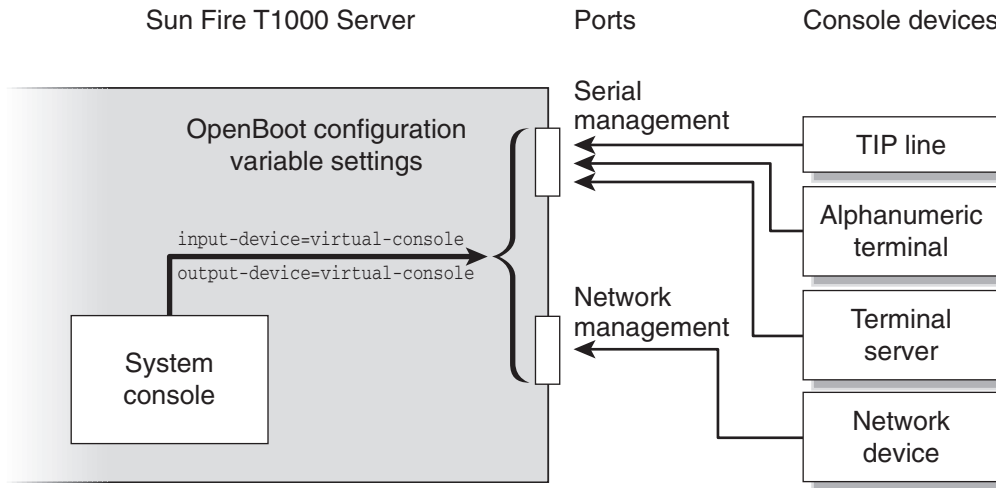
The system console displays status and error messages generated by firmware-based tests during system startup. After running those tests, you can enter special commands that affect the firmware and alter system behavior. For more information about tests that run during the boot process, refer to the *Sun Fire T1000 Server Service Manual*.

Once the operating system is booted, the system console displays UNIX system messages and accepts UNIX commands.

## Using the System Console

To use the system console, you need to attach an input/output device to the system. Initially, you might have to configure that hardware, and load and configure appropriate software as well.

You must also ensure that the system console is directed to the appropriate port on the Sun Fire T1000 server's back panel—generally, the one to which your hardware console device is attached (see [FIGURE 1-1](#)). You do this by setting the `input-device` and `output-device` OpenBoot configuration variables.



**FIGURE 1-1** Directing the System Console

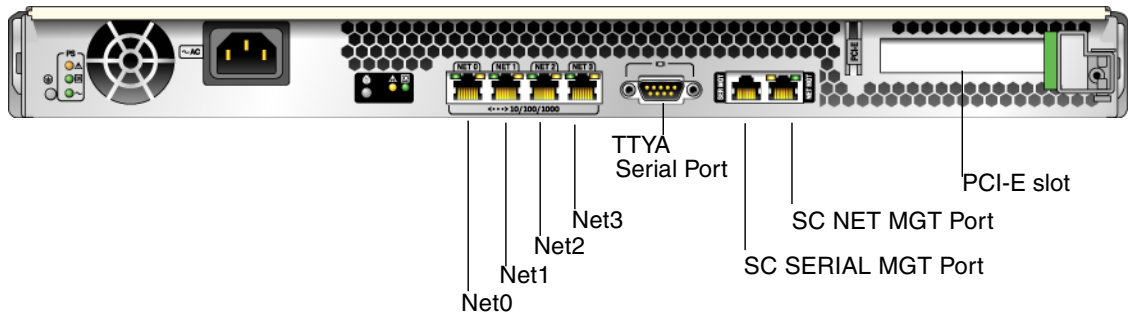
## Default System Console Connection Through the Serial Management and Network Management Ports

On Sun Fire T1000 servers, your first connection must be to the serial management port (SERIAL MGT) because the network management port is not available until you assign it an IP address. The system console comes preconfigured to allow input and output only by means of hardware devices connected to the serial or network management ports.

Typically, you connect one of the following hardware devices to the serial management port:

- Terminal server
- Alphanumeric terminal or similar device
- Tip line connected to another Sun computer

These constraints provide for secure access at the installation site.



**FIGURE 1-2** Rear I/O panel of the chassis—SC Serial Management Port Is Default Console Connection

Using a Tip line enables you to use windowing and operating system features on the system making the connection to the Sun Fire T1000 server.

The serial management port is not a general-purpose serial port. If you want to use a general-purpose serial port with your server – to connect a serial printer, for instance – use the regular 9-pin serial port on the back panel of the Sun Fire T1000. The Solaris OS sees this port as `ttya`.

- For instructions on accessing the system console through a terminal server, see [“Accessing the System Console Through a Terminal Server”](#) on page 16.
- For instructions on accessing the system console through an alphanumeric terminal, see [“Accessing the System Console Through an Alphanumeric Terminal”](#) on page 21.
- For instructions on accessing the system console through a Tip line, see [“Accessing the System Console Through a Tip Connection”](#) on page 18.

Once you have assigned an IP address to the network management port (NET MGT), you can connect an Ethernet-capable device to the system console through your network. This provides for remote monitoring and control. In addition, up to eight simultaneous connections to the system controller `sc>` prompt are available through the network management port. For more information, see [“Activating the Network Management Port”](#) on page 14.

---

# About the `sc>` Prompt

The ALOM system controller runs independently of the Sun Fire T1000 server and regardless of system power state. When you connect a Sun Fire T1000 server to AC power, the ALOM system controller immediately starts up and begins monitoring the system.

---

**Note** – To view ALOM system controller boot messages, you must connect an alphanumeric terminal to the serial management port *before* connecting the AC power cords to the Sun Fire T1000 server.

---

You can log in to the ALOM system controller at any time, regardless of system power state, as long as AC power is connected to the system and you have a way of interacting with the system. You can also access the ALOM system controller prompt (`sc>`) from the OpenBoot `ok` prompt or from the Solaris `#` or `%` prompt. The `sc>` prompt indicates that you are interacting with the ALOM system controller directly. It is the first prompt you see when you log in to the system through the serial management port or network management port.

---

**Note** – When you access the ALOM system controller for the first time and you issue an administrative command, it forces you to create a password for the default username: `admin` for subsequent access. After this initial configuration, you will be prompted to enter a user name and password every time you access the ALOM system controller.

---

For more information about navigating between the system console and the ALOM system controller, see the following:

- [“Getting to the `ok` Prompt” on page 10](#)
- [“Switching Between the ALOM System Controller and the System Console” on page 12](#)

## Access Through Multiple Controller Sessions

Up to nine ALOM system controller sessions can be active concurrently, one session through the serial management port and up to eight sessions through the network management port. Users of each of these sessions can issue commands at the `sc>` prompt. For more information, see:

- [“Accessing the System Controller” on page 13](#)
- [“Activating the Network Management Port” on page 14](#)

---

**Note** – Only one user has active control of the system console at any time. Any additional ALOM system controller sessions afford passive views of system console activity, until the active user of the system console logs out. However, the `console -f` command allows users to seize access to the system console from one another. For more information, see the *Advanced Lights Out Management (ALOM) CMT v 1.1 Guide* (819-3250-10).

---

## Reaching the `sc>` Prompt

There are several ways to get to the `sc>` prompt:

- You can log in directly to the ALOM system controller from a device connected to the serial management port. See [“Accessing the System Controller” on page 13](#).
- You can log in directly to the ALOM system controller using a connection through the network management port. See [“Activating the Network Management Port” on page 14](#).
- If you have logged in to the ALOM system controller and then directed the system console to the serial management and network management ports, you can return to the prior ALOM session by typing the ALOM system controller escape sequence (`#.`).

---

## OpenBoot `ok` Prompt

A Sun Fire T1000 server with the Solaris OS installed is capable of operating at different *run levels*. A synopsis of run levels follows. For a full description of run levels, refer to the Solaris system administration documentation.

Most of the time, you operate a Sun Fire T1000 server at run level 2 or run level 3, which are multiuser states with access to full system and network resources. Occasionally, you might operate the system at run level 1, which is a single-user administrative state. However, the lowest operational state is run level 0. At this state, it is safe to turn off power to the system.

When a Sun Fire T1000 server is at run level 0, the `ok` prompt appears. This prompt indicates that the OpenBoot firmware is in control of the system.

There are a number of scenarios under which OpenBoot firmware control can occur.

- By default, before the operating system is installed the system comes up under OpenBoot firmware control.

- When the `auto-boot?` OpenBoot configuration variable is set to `false` the system boots to the `ok` prompt.
- When the operating system is halted the system transitions to run level 0 in an orderly way.
- When the operating system crashes the system reverts to OpenBoot firmware control.
- During the boot process, when there is a serious hardware problem that prevents the operating system from running, the system reverts to OpenBoot firmware control.
- When a serious hardware problem develops while the system is running, the operating system transitions smoothly to run level 0.
- When you deliberately place the system under firmware control in order to execute firmware-based commands.

It is the last of these scenarios which most often concerns you as an administrator, since there will be times when you need to reach the `ok` prompt. The section [“Reaching the `ok` Prompt” on page 8](#) lists several ways. For detailed instructions, see [“Getting to the `ok` Prompt” on page 10](#).

## Reaching the `ok` Prompt

There are several ways to reach the `ok` prompt, depending on the state of the system and the means by which you are accessing the system console. These are:

- Graceful shutdown
- ALOM system controller `break` and `console` command pair
- L1-A (Stop-A) keys or Break key
- Manual system reset

A discussion of each method follows. For step-by-step instructions, see [“Getting to the `ok` Prompt” on page 10](#).

---

**Note** – As a rule, before suspending the operating system, you should back up files, warn users of the impending shutdown, and halt the system in an orderly manner. However, it is not always possible to take such precautions, especially if the system is malfunctioning.

---



## Graceful Shutdown

The preferred method of reaching the `ok` prompt is to shut down the operating system by issuing an appropriate command (for example, the `shutdown`, `init`, or `uadmin` command) as described in Solaris system administration documentation. You can also use the system Power button to initiate a graceful system shutdown.

Gracefully shutting down the system prevents data loss, enables you to warn users beforehand, and causes minimal disruption. You can usually perform a graceful shutdown, provided the Solaris OS is running and the hardware has not experienced serious failure.

You can also perform a graceful system shutdown from the ALOM system controller command prompt.

## ALOM System Controller `break` or `console` Command

Typing `break` from the `sc>` prompt forces a running Sun Fire T1000 server to drop into OpenBoot firmware control. If the operating system is already halted, you can use the `console` command instead of `break` to reach the `ok` prompt.

After forcing the system into OpenBoot firmware control, be aware that issuing certain OpenBoot commands (like `probe-scsi`, `probe-scsi-all`, or `probe-ide`) might hang the system.

## L1-A (Stop-A) Keys or Break Key

When it is impossible or impractical to shut down the system gracefully, you can get to the `ok` prompt by typing the L1-A (Stop-A) key sequence from a Sun keyboard. If you have an alphanumeric terminal attached to the Sun Fire T1000 server, press the Break key.

After forcing the system into OpenBoot firmware control, be aware that issuing certain OpenBoot commands (like `probe-scsi`, `probe-scsi-all`, or `probe-ide`) might hang the system.

---

**Note** – These methods of reaching the `ok` prompt work only if the system console has been redirected to the appropriate port. For details, see [“System Console OpenBoot Configuration Variable Settings”](#) on page 22.

---

## Manual System Reset



---

**Caution** – Forcing a manual system reset results in loss of system state data, and should be attempted only as a last resort. After a manual system reset, all state information is lost, which inhibits troubleshooting the cause of the problem until the problem reoccurs.

---

Use the ALOM system controller `reset` command, or `poweron` and `poweroff` commands, to reset the server. Reaching the `ok` prompt by performing a manual system reset or by power-cycling the system should be the method of last resort. Using these commands result in the loss of all system coherence and state information. A manual system reset could corrupt the server's file systems, although the `fsck` command usually restores them. Use this method only when nothing else works.



---

**Caution** – Accessing the `ok` prompt suspends the Solaris OS.

---

When you access the `ok` prompt from a functioning Sun Fire T1000 server, you are suspending the Solaris OS and placing the system under firmware control. Any processes that were running under the operating system are also suspended, and *the state of such processes might not be recoverable*.

The commands you run from the `ok` prompt have the potential to affect the state of the system. This means that it is not always possible to resume execution of the operating system from the point at which it was suspended. Although the `go` command will resume execution in most circumstances, in general, each time you drop the system down to the `ok` prompt, you should expect to have to reboot the system to get back to the operating system.

## For More Information

For more information about the OpenBoot firmware, refer to the *OpenBoot 4.x Command Reference Manual*. An online version of the manual is included with the OpenBoot Collection AnswerBook that ships with Solaris software.

## Getting to the `ok` Prompt

This procedure provides several ways of reaching the `ok` prompt. For details about when to use each method, see [“OpenBoot `ok` Prompt” on page 7](#).



---

**Caution** – Dropping the Sun Fire T1000 server to the `ok` prompt suspends all application and operating system software. After you issue firmware commands and run firmware-based tests from the `ok` prompt, the system might not be able to resume where it left off.

---

If at all possible, back up system data before starting this procedure. Also exit or stop all applications and warn users of the impending loss of service. For information about the appropriate backup and shutdown procedures, see Solaris system administration documentation.

## ▼ To Get to the `ok` Prompt

### 1. Decide which method you need to use to reach the `ok` prompt.

See “[OpenBoot `ok` Prompt](#)” on page 7 for details.

### 2. Follow the appropriate instructions in [TABLE 1-2](#).

**TABLE 1-2** Ways of Accessing the `ok` Prompt

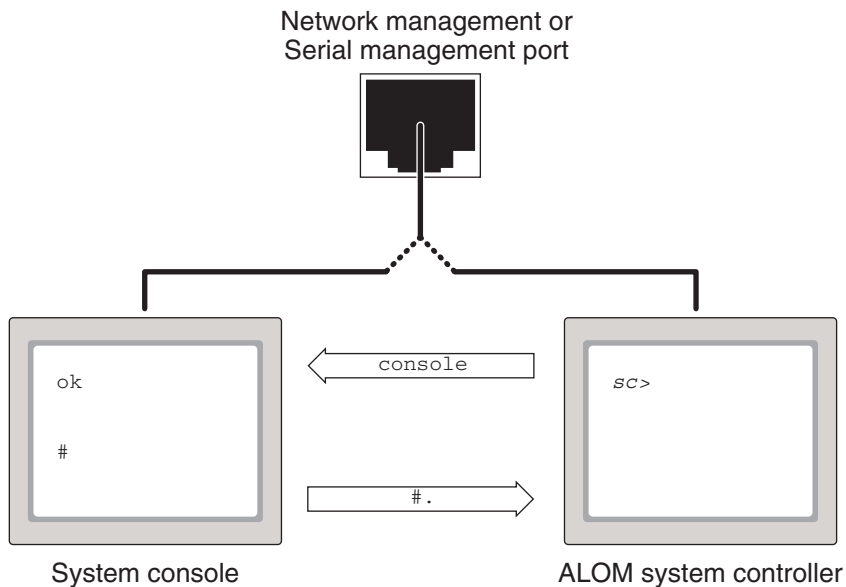
Access Method	What to Do
Graceful shutdown of the Solaris OS	<ul style="list-style-type: none"><li>From a shell or command tool window, issue an appropriate command (for example, the <code>shutdown</code> or <code>init</code> command) as described in Solaris system administration documentation.</li></ul>
L1-A (Stop-A) keys or Break key	<ul style="list-style-type: none"><li>From a Sun keyboard connected directly to the Sun Fire T1000 server, press the Stop and A keys simultaneously.* –or–</li><li>From an alphanumeric terminal configured to access the system console, press the Break key.</li></ul>
ALOM system controller <code>break</code> and <code>console</code> commands	<ul style="list-style-type: none"><li>From the <code>sc&gt;</code> prompt, type the <code>break</code> command. The <code>break</code> command should put the system in a state in which the operating environment software is not running and the server is under OpenBoot firmware control.</li><li>Then issue the <code>console</code> command.</li></ul>
Manual system reset	<ul style="list-style-type: none"><li>From the <code>sc&gt;</code> prompt, type the <code>reset</code> command.</li></ul>

\* Requires the OpenBoot configuration variable `input-device=keyboard`. For more information, see “[System Console OpenBoot Configuration Variable Settings](#)” on page 22.

---

# Switching Between the ALOM System Controller and the System Console

The Sun Fire T1000 server features two management ports, labeled SERIAL MGT and NET MGT, located on the server's back panel. If the system console is directed to use the serial management and network management ports (its default configuration), these ports provide access to both the system console and the ALOM system controller, each on a separate channel (see [FIGURE 1-3](#)).



**FIGURE 1-3** Separate System Console and System Controller Channels

If the system console is configured to be accessible from the serial management and network management ports, when you connect through one of these ports you can access either the ALOM command-line interface or the system console. You can switch between the ALOM system controller and the system console at any time, but you cannot access both at the same time from a single terminal or shell tool.

The prompt displayed on the terminal or shell tool tells you which channel you are accessing:

- The # or % prompt indicates that you are at the system console and that the Solaris OS is running.
- The ok prompt indicates that you are at the system console and that the server is running under OpenBoot firmware control.
- The sc> prompt indicates that you are at the ALOM system controller.

---

**Note** – If no text or prompt appears, it might be the case that no console messages were recently generated by the system. If this happens, pressing the terminal’s Enter or Return key should produce a prompt. If the ALOM session has timed out, pressing the terminal’s Enter or Return key may not be effective. In that case, it may be necessary to issue the escape sequence is #. (Pound-Period) to return to ALOM.

---

To reach the system console from the ALOM system controller,

- Type the `console` command at the `sc>` prompt.

To reach the ALOM system controller from the system console,

- Type the system controller escape sequence,  
By default, the escape sequence is #. (Pound-Period).

For more information about communicating with the ALOM system controller and system console, see the following:

- [“Communicating With the System” on page 1](#)
- [“About the sc> Prompt” on page 6](#)
- [“OpenBoot ok Prompt” on page 7](#)
- [“Accessing the System Controller” on page 13](#)
- *Advanced Lights Out Management (ALOM) CMT v 1.1 Guide*

---

## Accessing the System Controller

The following sections describe ways of accessing the system controller.

### Using the Serial Management Port

This procedure assumes that the system console is directed to use the serial management and network management ports (the default configuration).

When you are accessing the system console using a device connected to the serial management port, you first access the ALOM system controller and its `sc>` prompt. After connecting to the ALOM system controller, you can switch to the system console.

For more information about the ALOM system controller card, refer to the *Advanced Lights Out Management (ALOM) CMT v 1.1 Guide* (819-3250-10).

## ▼ To Use the Serial Management Port

**1. Ensure that the serial port on your connecting device is set to the following parameters:**

- 9600 baud
- 8 bits
- No parity
- 1 stop bit
- No handshaking

**2. Establish an ALOM system controller session.**

See *Advanced Lights Out Management (ALOM) CMT v 1.1 Guide* (819-3250-10) for instructions.

**3. To connect to the system console, at the ALOM system controller command prompt, type:**

```
sc> console
```

The `console` command switches you to the system console.

**4. To switch back to the `sc>` prompt, type the #. (Pound-Period) escape sequence**

---

**Note** – The characters of the escape sequence are not echoed to the screen.

---

**5. For instructions on how to use the ALOM system controller, see the *Advanced Lights Out Management (ALOM) CMT v 1.1 Guide* (819-3250-10).**

## Activating the Network Management Port

You must assign an Internet Protocol (IP) address to the network management port before you can use it. If you are configuring the network management port for the first time, you must first connect to the ALOM system controller using the serial

management port and then assign an IP address to the network management port. You can either assign an IP address manually, or you can configure the port to obtain an IP address using the Dynamic Host Configuration Protocol (DHCP) from another server.

Data centers frequently devote a separate subnet to system management. If your data center has such a configuration, connect the network management port to this subnet.

---

**Note** – The network management port is a 10/100 BASE-T port. The IP address assigned to the network management port is a unique IP address, separate from the main Sun Fire T1000 server IP address, and is dedicated for use only with the ALOM system controller.

---

## ▼ To Activate the Network Management Port

1. **Connect an Ethernet cable to the network management port.**
2. **Log in to the ALOM system controller through the serial management port.**

For more information about connecting to the serial management port, see [“Accessing the System Controller” on page 13](#).

3. **Type one of the following commands:**

- **If your network uses static IP addresses, type:**

```
sc> setsc if_network true
sc> setsc netsc_ipaddr ip-address
sc> setsc netsc_ipnetmask ip-address
sc> setsc netsc_ipgateway ip-address
```

- **If your network uses Dynamic Host Configuration Protocol (DHCP), type:**

```
sc> setsc netsc_dhcp true
```

4. **You must reset the system controller so that the new settings take affect:**

```
sc> resetsc
```

5. After the system controller resets, log in to the system controller and issue the `shownetwork` command to verify network settings:

```
sc> shownetwork
```

You can log out of the ALOM system controller session at this point.

To connect through the network management port, use the `telnet` command to the IP address you specified in [Step 3](#) of the preceding procedure.

## Accessing the System Console Through a Terminal Server

The following procedure assumes that you are accessing the system console by connecting a terminal server to the serial management port (SERIAL MGT) of the Sun Fire T1000 server.

### ▼ To Access The System Console Through a Terminal Server

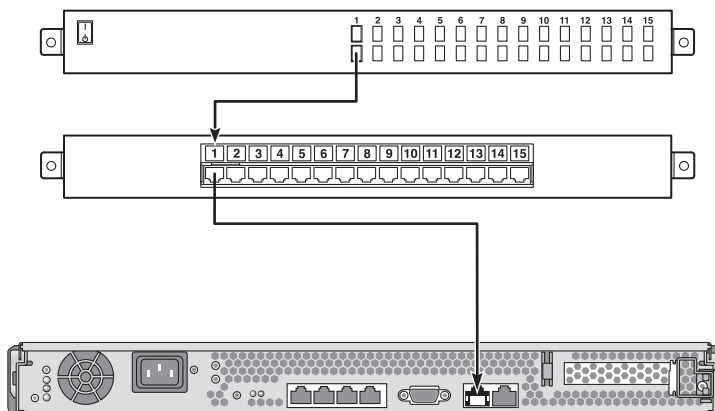
1. Complete the physical connection from the serial management port to your terminal server.

The serial management port on the Sun Fire T1000 server is a data terminal equipment (DTE) port. The pinouts for the serial management port correspond with the pinouts for the RJ-45 ports on the Serial Interface Breakout Cable supplied by Cisco for use with the Cisco AS2511-RJ terminal server. If you use a terminal server made by another manufacturer, check that the serial port pinouts of the Sun Fire T1000 server match those of the terminal server you plan to use.

If the pinouts for the server serial ports correspond with the pinouts for the RJ-45 ports on the terminal server, you have two connection options:

- Connect a serial interface breakout cable directly to the Sun Fire T1000 server. See [“Accessing the System Controller” on page 13](#).
- Connect a serial interface breakout cable to a patch panel and use the straight-through patch cable (supplied by Sun) to connect the patch panel to the server.





**FIGURE 1-4** Patch Panel Connection Between a Terminal Server and a Sun Fire T1000 Server

If the pinouts for the serial management port *do not* correspond with the pinouts for the RJ-45 ports on the terminal server, you need to make a crossover cable that takes each pin on the Sun Fire T1000 server serial management port to the corresponding pin in the terminal server's serial port.

[TABLE 1-3](#) shows the crossovers that the cable must perform.

**TABLE 1-3** Pin Crossovers for Connecting a Sun Fire T1000 Server to a Terminal Server

Sun Fire T1000 Serial Port (RJ-45 Connector) Pin	Terminal Server Serial Port Pin
Pin 1 (RTS)	Pin 1 (CTS)
Pin 2 (DTR)	Pin 2 (DSR)
Pin 3 (TXD)	Pin 3 (RXD)
Pin 4 (Signal Ground)	Pin 4 (Signal Ground)
Pin 5 (Signal Ground)	Pin 5 (Signal Ground)
Pin 6 (RXD)	Pin 6 (TXD)
Pin 7 (DSR /DCD)	Pin 7 (DTR)
Pin 8 (CTS)	Pin 8 (RTS)

**2. Open a terminal session on the connecting device, and type:**

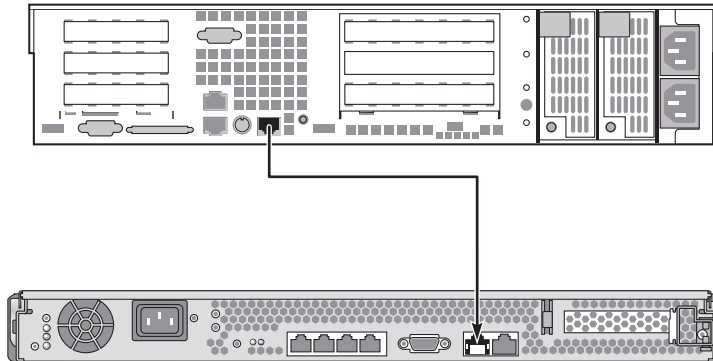
```
% telnet IP-address-of-terminal-server port-number
```

For example, for a Sun Fire T1000 server connected to port 10000 on a terminal server whose IP address is 192.20.30.10, you would type:

```
% telnet 192.20.30.10 10000
```

## Accessing the System Console Through a Tip Connection

Use this procedure to access the Sun Fire T1000 server system console by connecting the serial management port (SERIAL MGT) to the serial port of another Sun system (FIGURE 1-5).



**FIGURE 1-5** Tip Connection Between a Sun Fire T1000 Server and Another Sun System

### ▼ To Access the System Console Through the Tip Connection

1. **Connect the RJ-45 serial cable and, if required, the DB-9 or DB-25 adapter provided.**

The cable and adapter connect between another Sun system's serial port (typically ttyb) and the serial management port on the back panel of the Sun Fire T1000 server. Pinouts, part numbers, and other details about the serial cable and adapter are provided in the *Sun Fire T1000 Server Service Manual* (819-3248-10).

2. Ensure that the `/etc/remote` file on the Sun system contains an entry for `hardwire`.

Most releases of Solaris OS software shipped since 1992 contain an `/etc/remote` file with the appropriate `hardwire` entry. However, if the Sun system is running an older version of Solaris OS software, or if the `/etc/remote` file has been modified, you might need to edit it. See [“Modifying the `/etc/remote` File” on page 19](#) for details.

3. In a shell tool window on the Sun system, type:

```
% tip hardwire
```

The Sun system responds by displaying:

```
connected
```

The shell tool is now a Tip window directed to the Sun Fire T1000 server through the Sun system’s serial port. This connection is established and maintained even when the Sun Fire T1000 server is completely powered off or just starting up.

---

**Note** – Use a shell tool or a CDE terminal (such as `dtterm`), not a command tool. Some Tip commands might not work properly in a command tool window.

---

## Modifying the `/etc/remote` File

This procedure might be necessary if you are accessing the Sun Fire T1000 server using a Tip connection from a Sun system running an older version of the Solaris OS software. You might also need to perform this procedure if the `/etc/remote` file on the Sun system has been altered and no longer contains an appropriate `hardwire` entry.

Log in as superuser to the system console of a Sun system that you intend to use to establish a Tip connection to the Sun Fire T1000 server.

## ▼ To Modify the /etc/remote File

1. Determine the release level of Solaris OS software installed on the Sun system.  
Type:

```
# uname -r
```

The system responds with a release number.

2. Do one of the following, depending on the number displayed.

- If the number displayed by the `uname -r` command is 5.0 or higher:

The Solaris OS software shipped with an appropriate entry for `hardware` in the `/etc/remote` file. If you have reason to suspect that this file was altered and the `hardware` entry modified or deleted, check the entry against the following example, and edit it as needed.

```
hardware:\
      :dv=/dev/term/b:br#9600:el=^C^S^Q^U^D:ie=%$:oe=^D:
```

---

**Note** – If you intend to use the Sun system’s serial port A rather than serial port B, edit this entry by replacing `/dev/term/b` with `/dev/term/a`.

---

- If the number displayed by the `uname -r` command is less than 5.0:

Check the `/etc/remote` file and add the following entry, if it does not already exist.

```
hardware:\
      :dv=/dev/ttyb:br#9600:el=^C^S^Q^U^D:ie=%$:oe=^D:
```

---

**Note** – If you intend to use the Sun system’s serial port A rather than serial port B, edit this entry by replacing `/dev/ttyb` with `/dev/ttya`.

---

The `/etc/remote` file is now properly configured. Continue establishing a Tip connection to the Sun Fire T1000 server system console. See [“Accessing the System Console Through a Tip Connection” on page 18](#).

If you have redirected the system console to TTYB and want to change the system console settings back to use the serial management and network management ports, see [“System Console OpenBoot Configuration Variable Settings” on page 22](#).

# Accessing the System Console Through an Alphanumeric Terminal

Use this procedure when you access the Sun Fire T1000 server system console by connecting the serial port of an alphanumeric terminal to the serial management port (SERIAL MGT) of the Sun Fire T1000 server.

## ▼ To Access the System Console Through an Alphanumeric Terminal

### 1. Attach one end of the serial cable to the alphanumeric terminal's serial port.

Use a null modem serial cable or an RJ-45 serial cable and null modem adapter. Connect this cable to the terminal's serial port connector.

### 2. Attach the opposite end of the serial cable to the serial management port on the Sun Fire T1000 server.

### 3. Connect the alphanumeric terminal's power cord to an AC outlet.

### 4. Set the alphanumeric terminal to receive:

- 9600 baud
- 8 bits
- No parity
- 1 stop bit
- No handshake protocol

Refer to the documentation accompanying your terminal for information about how to configure the terminal.

You can issue system commands and view system messages using the alphanumeric terminal. Continue with your installation or diagnostic procedure, as needed. When you are finished, type the alphanumeric terminal's escape sequence.

For more information about connecting to and using the ALOM system controller, refer to the *Advanced Lights Out Management (ALOM) CMT v 1.1 Guide* (819-3250-10).

---

# System Console OpenBoot Configuration Variable Settings

The Sun Fire T1000 system console is directed to the serial management and network management ports (SERIAL MGT and NET MGT) by default.

Certain OpenBoot configuration variables control from where system console input is taken and to where its output is directed. The table below shows how to set these variables in order to use the serial management and network management ports.  
(Continued)

**TABLE 1-4** OpenBoot Configuration Variables That Affect the System Console

OpenBoot Configuration Variable Name	Serial and Network Management Ports
<code>output-device</code>	virtual-console
<code>input-device</code>	virtual-console

The serial management port does not function as a standard serial connection. (If you want to connect a conventional serial device (such as a printer) to the system, you must connect it to `ttya` not the serial management port.)

It is important to note that the `sc>` prompt and POST messages are only available through the serial management port and network management port.

In addition to the OpenBoot configuration variables described in [TABLE 1-4](#), there are other variables that affect and determine system behavior. These variables are discussed in more detail in [Appendix A](#).

# Managing RAS Features and System Firmware

---

This chapter describes how to manage reliability, availability, and serviceability (RAS) features and system firmware, including Sun Advanced Lights Out Manager (ALOM) system controller, and automatic system recovery (ASR). In addition, this chapter describes how to unconfigure and reconfigure a device manually, and introduces multipathing software.

This chapter contains the following sections:

- [“ALOM System Controller” on page 23](#)
- [“Automatic System Recovery” on page 28](#)
- [“Unconfiguring and Reconfiguring Devices” on page 33](#)
- [“Multipathing Software” on page 35](#)

---

**Note** – This chapter does not cover detailed troubleshooting and diagnostic procedures. For information about fault isolation and diagnostic procedures, refer to the *Sun Fire T1000 Server Service Manual* (819-3248-10).

---

---

## ALOM System Controller

The ALOM system controller supports a total of nine concurrent sessions per server: one connection through the serial management port and eight connections available through the network management port.

After you log in to your ALOM account, the ALOM system controller command prompt (`sc>`) appears, and you can enter ALOM system controller commands. If the command you want to use has multiple options, you can either enter the options individually or grouped together, as shown in the following example. The commands shown in the following example are identical.

```
sc> poweroff -f -y
sc> poweroff -fy
```

## Logging In To the ALOM System Controller

All environmental monitoring and control is handled by the ALOM system controller. The ALOM system controller command prompt (`sc>`) provides you with a way of interacting with the system controller. For more information about the `sc>` prompt, see [“About the `sc>` Prompt” on page 7](#).

For instructions on connecting to the ALOM system controller, see:

- [“Accessing the System Controller” on page 15](#)
- [“Activating the Network Management Port” on page 17](#)

---

**Note** – This procedure assumes that the system console is directed to use the serial management and network management ports (the default configuration).

---



## ▼ To Log In To the ALOM System Controller

1. **If you are logged in to the system console, type #. (Pound-Period) to get to the `sc>` prompt.**

Press the Pound sign key, followed by the Period key. Then press the Return key.

2. **At the ALOM login prompt, enter the login name and press Return.**

The default login name is `admin`.

```
Sun(tm) Advanced Lights Out Manager 1.0.12
Please login: admin
```

3. **At the password prompt, enter the password and press Return twice to get to the `sc>` prompt.**

```
Please Enter password:
sc>
```

---

**Note** – There is no default password. You must assign a password during initial system configuration. For more information, refer to your *Sun Fire T2000 Server Installation Guide* (819-3246-10) and *Advanced Lights Out Management (ALOM) CMT v 1.1 Guide* (819-3250-10).

---



---

**Caution** – In order to provide optimum system security, best practice is to change the default system login name and password during initial setup.

---

Using the ALOM system controller, you can monitor the system, turn the Locator LED on and off, or perform maintenance tasks on the ALOM system controller card itself. For more information, refer to the *Advanced Lights Out Management (ALOM) CMT v 1.1 Guide* (819-3250-10).

## ▼ To View Environmental Information

1. **Log in to the ALOM system controller.**
2. **Use the `showenvironment` command to display a snapshot of the server's environmental status.**

The information this command can display includes temperature, power supply status, front panel LED status, system control keyswitch position, and so on.

---

**Note** – Some environmental information might not be available when the server is in standby mode.

---

---

**Note** – You do not need ALOM system controller user permissions to use this command.

---

## Interpreting System LEDs

The behavior of LEDs on the Sun Fire T1000 Server conform the the American National Standards Institute (ANSI) Status Indicator Standard (SIS). These standard LED behaviors are described in [TABLE 2-1](#).

**TABLE 2-1** LED Behavior and Meaning

LED Behavior	Meaning
Off	The condition represented by the color is not true
Steady On	The condition represented by the color is true
Standby Blink	The system is functioning at a minimal level and ready to resume full function
Slow Blink	Transitory activity or new activity represented by the color is taking place
Fast Blink	Attention is required
Feedback Flash	Activity is taking place commensurate with the flash rate (such as disk drive activity)

The LEDs have assigned meanings, described in [TABLE 2-2](#).

**TABLE 2-2** LED Behaviors with Assigned Meanings

Color	Behavior	Definition	Description
White	Off	Steady State	
	Fast Blink	4Hz repeating sequence, equal intervals On and Off.	This indicator helps you to locate a particular enclosure, board, or subsystem. For example, the Locator LED
Blue	Off	Steady State	

**TABLE 2-2** LED Behaviors with Assigned Meanings (*Continued*)

<b>Color</b>	<b>Behavior</b>	<b>Definition</b>	<b>Description</b>
	Steady On	Steady State	If blue is on, a service action can be performed on the applicable component with no adverse consequences. For example, the OK-to-Remove LED
Yellow/Amber	Off	Steady State	
	Slow Blink	1Hz repeating sequence, equal intervals On and Off.	This indicator signals new fault conditions. Service is required. For example, the Service Required LED.
	Steady On	Steady State	The amber indicator stays on until the service action is completed and the system returns to normal function.
Green	Off	Steady State	
	Standby Blink	Repeating sequence consisting of a brief (0.1 sec.) ON flash followed by a long OFF period (2.9 sec.)	The system is running at a minimum level and is ready to be quickly revived to full function. For example, the System Activity LED
	Steady On	Steady State	Status normal; system or component functioning with no service actions required
	Slow Blink		A transitory (temporary) event is taking place for which direct proportional feedback is not needed or not feasible.

## Controlling the Locator LED

You control the Locator LED from the `sc>` prompt or by the Locator button on the front of the chassis.



**FIGURE 2-1** LocatorButton on front of the Sun Fire T1000 Chassis

- To turn on the Locator LED from the ALOM system controller command prompt, type:

```
sc> setlocator on
```

- To turn off the Locator LED from the ALOM system controller command prompt, type:

```
sc> setlocator off
```

- To display the state of the Locator LED from the ALOM system controller command prompt, type:

```
sc> showlocator  
Locator LED is on.
```

---

**Note** – You do not need user permissions to use the `setlocator` and `showlocator` commands

---

---

## Automatic System Recovery

The system provides for automatic system recovery (ASR) from failures in memory modules or PCI cards.

Automatic system recovery functionality enables the system to resume operation after experiencing certain nonfatal hardware faults or failures. When ASR is enabled, the system's firmware diagnostics automatically detect failed hardware components. An auto-configuring capability designed into the system firmware enables the

system to unconfigure failed components and to restore system operation. As long as the system is capable of operating without the failed component, the ASR features enable the system to reboot automatically, without operator intervention.

---

**Note** – ASR is not activated until you enable it. See [“Enabling and Disabling Automatic System Recovery”](#) on page 31.

---

For more information about ASR, refer to the *Sun Fire T1000 Server Service Manual* (819-3248-10).

## Auto-Boot Options

The system firmware stores a configuration variable called `auto-boot?`, which controls whether the firmware will automatically boot the operating system after each reset. The default setting for Sun platforms is `true`.

Normally, if a system fails power-on diagnostics, `auto-boot?` is ignored and the system does not boot unless an operator boots the system manually. An automatic boot is generally not acceptable for booting a system in a degraded state. Therefore, the Sun Fire T1000 server OpenBoot firmware provides a second setting, `auto-boot-on-error?`. This setting controls whether the system will attempt a degraded boot when a subsystem failure is detected. Both the `auto-boot?` and `auto-boot-on-error?` switches must be set to `true` to enable an automatic degraded boot. To set the switches, type:

```
ok setenv auto-boot? true
ok setenv auto-boot-on-error? true
```

---

**Note** – The default setting for `auto-boot-on-error?` is `false`. The system will not attempt a degraded boot unless you change this setting to `true`. In addition, the system will not attempt a degraded boot in response to any fatal nonrecoverable error, even if degraded booting is enabled. For examples of fatal nonrecoverable errors, see [“Error Handling Summary”](#) on page 29.

---

## Error Handling Summary

Error handling during the power-on sequence falls into one of the following three cases:

- If no errors are detected by POST or OpenBoot Diagnostics, the system attempts to boot if `auto-boot?` is true.
- If only nonfatal errors are detected by POST or OpenBoot Diagnostics, the system attempts to boot if `auto-boot?` is true and `auto-boot-on-error?` is true. Nonfatal errors include the following:
  - Ethernet interface failure.
  - Serial interface failure.
  - PCI Express card failure.
  - Memory failure. Given a failed DIMM, the firmware will unconfigure the entire logical bank associated with the failed module. Another nonfailing logical bank must be present in the system for the system to attempt a degraded boot. Note that certain DIMM failures may not be diagnosable to a single DIMM. These failures are fatal, and result in both logical banks being unconfigured.

---

**Note** – If POST or OpenBoot Diagnostics detects a nonfatal error associated with the normal boot device, the OpenBoot firmware automatically unconfigures the failed device and tries the next-in-line boot device, as specified by the `boot-device` configuration variable.

---

- If a fatal error is detected by POST or OpenBoot Diagnostics, the system does not boot regardless of the settings of `auto-boot?` or `auto-boot-on-error?`. Fatal nonrecoverable errors include the following:
  - Any CPU failed
  - All logical memory banks failed
  - Flash RAM cyclical redundancy check (CRC) failure
  - Critical field-replaceable unit (FRU) PROM configuration data failure
  - Critical system configuration SEEPROM read failure
  - Critical application-specific integrated circuit (ASIC) failure

For more information about troubleshooting fatal errors, refer to the *Sun Fire T1000 Server Service Manual* (819-3248-10).

## Reset Scenarios

Three ALOM configuration variables, `diag_mode`, `diag_level`, and `diag_trigger`, control whether the system runs firmware diagnostics in response to system reset events.

The standard system reset protocol bypasses POST completely unless the virtual keyswitch or ALOM variables are set as follows:

**TABLE 2-3** Virtual Keyswitch Setting for Reset Scenario

Keyswitch	Value
virtual keyswitch	diag

**TABLE 2-4** ALOM Variable Settings for Reset Scenario

Variable	Value
diag-mode	normal or service
diag-level	min or max
diag-trigger	power-on-reset error-reset

The default settings for these variables are:

- `diag_mode = normal`
- `diag_level = max`
- `diag_trigger = power-on-reset`

Therefore, ASR is enabled by default. For instructions, see [“Enabling and Disabling Automatic System Recovery”](#) on page 31.

## Automatic System Recovery User Commands

The ALOM commands are available for obtaining ASR status information and for manually unconfiguring or reconfiguring system devices. For more information, see:

- [“Unconfiguring and Reconfiguring Devices”](#) on page 33
- [“To Reconfigure a Device Manually”](#) on page 34
- [“Obtaining Automatic System Recovery Information”](#) on page 33

## Enabling and Disabling Automatic System Recovery

The automatic system recovery (ASR) feature is not activated until you enable it. Enabling ASR requires changing configuration variables in ALOM as well as OpenBoot.

## ▼ To Enable Automatic System Recovery

1. At the `sc>` prompt, type:

```
sc> setsc diag-mode normal
sc> setsc diag-level max
sc> setsc diag-trigger power-on-reset
```

2. At the `ok` prompt, type:

```
ok setenv auto-boot true
ok setenv auto-boot-on-error? true
```

---

**Note** – For more information about OpenBoot configuration variables, refer to the *Sun Fire T1000 Server Service Manual* (819-3248-10).

---

3. To cause the parameter changes to take effect, type:

```
ok reset-all
```

The system permanently stores the parameter changes and boots automatically when the OpenBoot configuration variable `auto-boot?` is set to `true` (its default value).

---

**Note** – To store parameter changes, you can also power cycle the system using the front panel Power button.

---

## ▼ To Disable Automatic System Recovery

1. At the `ok` prompt, type:

```
ok setenv auto-boot-on-error? false
```

2. To cause the parameter changes to take effect, type:

```
ok reset-all
```

The system permanently stores the parameter change.



---

**Note** – To store parameter changes, you can also power cycle the system using the front panel Power button.

---

After you disable the automatic system recovery (ASR) feature, it is not activated again until you re-enable it.

## Obtaining Automatic System Recovery Information

Use the following procedure to retrieve information about the status of system components affected by automatic system recovery (ASR).

- At the `sc>` prompt, type:

```
sc> showcomponent
```

In the `showcomponent` command output, any devices marked disabled have been manually unconfigured using the system firmware. The `showcomponent` command also lists devices that have failed firmware diagnostics and have been automatically unconfigured by the system firmware.

For more information, see:

- [“Automatic System Recovery” on page 28](#)
- [“Enabling and Disabling Automatic System Recovery” on page 31](#)
- [“To Disable Automatic System Recovery” on page 32](#)
- [“Unconfiguring and Reconfiguring Devices” on page 33](#)
- [“To Reconfigure a Device Manually” on page 34](#)

---

## Unconfiguring and Reconfiguring Devices

To support a degraded boot capability, the ALOM firmware provides the `disablecomponent` command, which enables you to unconfigure system devices manually. This command “marks” the specified device as *disabled* by creating an entry in the ASR database. Any device marked `disabled`, whether manually or by the system’s firmware diagnostics, is removed from the system’s machine description prior to the hand-off to Hypervisor or OpenBoot PROM.

## ▼ To Unconfigure a Device Manually

- At the `sc>` prompt, type:

```
sc> disablecomponent asr-key
```

Where the *asr-key* is one of the device identifiers from [TABLE 2-5](#)

---

**Note** – The device identifiers are not case sensitive. You can type them as uppercase or lowercase characters.

---

**TABLE 2-5** Device Identifiers and Devices

Device Identifiers	Devices
MB/CMPcpu_number/Pstrand_number	CPU Strand (Number: 0-31)
PCIEslot_number	PCI-E Slot (Number: 0)
MB/PCIEa	PCI-E leaf A (/pci@780)
MB/PCIEb	PCI-E leaf B (/pci@7c0)
MB/CMP0/CHchannel_number/Rrank_number/Ddim_number	DIMMS

## ▼ To Reconfigure a Device Manually

1. At the `sc>` prompt, type:

```
sc> enablecomponent asr-key
```

where the *asr-key* is any device identifier from [TABLE 2-5](#)

---

**Note** – The device identifiers are not case sensitive. You can type them as uppercase or lowercase characters.

---

You can use the ALOM `enablecomponent` command to reconfigure any device that you previously unconfigured with the `disablecomponent` command.

---

# Displaying System Fault Information

ALOM software lets you display current valid system faults. The `showfaults` command displays the fault ID, the faulted FRU device, and the fault message to standard output. The `showfaults` command also displays POST results. For example,

```
sc> showfaults
ID FRU          Fault
  0 FT0.F2      SYS_FAN at FT0.F2 has FAILED.
```

Adding the `-v` option,

```
sc> showfaults -v
ID Time          FRU          Fault
  0  MAY 20 10:47:32 FT0.F2      SYS_FAN at FT0.F2 has FAILED.
```

For more information about the `showfaults` command, refer to the *Advanced Lights Out Management (ALOM) CMT v 1.1 Guide* (819-3250-10).

## ▼ To Display System Fault Information

- At the `sc>` prompt type:

```
sc> showfaults -v
```

---

# Multipathing Software

Multipathing software lets you define and control redundant physical paths to I/O devices, such as storage devices and network interfaces. If the active path to a device becomes unavailable, the software can automatically switch to an alternate path to maintain availability. This capability is known as *automatic failover*. To take advantage of multipathing capabilities, you must configure the server with redundant hardware, such as redundant network interfaces or two host bus adapters connected to the same dual-ported storage array.

For the Sun Fire T1000 server, three different types of multipathing software are available:

- Solaris IP Network Multipathing software provides multipathing and load-balancing capabilities for IP network interfaces.
- VERITAS Volume Manager (VVM) software includes a feature called Dynamic Multipathing (DMP), which provides disk multipathing as well as disk load balancing to optimize I/O throughput.
- Sun StorEdge™ Traffic Manager is an architecture fully integrated within the Solaris OS (beginning with the Solaris 8 release) that enables I/O devices to be accessed through multiple host controller interfaces from a single instance of the I/O device.

## For More Information

For instructions on how to configure and administer Solaris IP Network Multipathing, consult the *IP Network Multipathing Administration Guide* provided with your specific Solaris release.

For information about VVM and its DMP feature, refer to the documentation provided with the VERITAS Volume Manager software.

For information about Sun StorEdge Traffic Manager, refer to your Solaris OS documentation.

---

## Storing FRU Information

The `setfru` command enables you to store information on FRU PROMs. For example, you might store information identifying the server in which the FRUs have been installed.

### ▼ To Store Information in Available FRU PROMs

- At the `sc>` prompt type:

```
setfru -c data
```

# OpenBoot Configuration Variables

**TABLE A-1** describes the OpenBoot firmware configuration variables stored in non-volatile memory on the system. The OpenBoot configuration variables are printed here in the order in which they appear when you issue the `showenv` command.

**TABLE A-1** OpenBoot Configuration Variables Stored on the System Configuration Card

Variable	Possible Values	Default Value	Description
<code>local-mac-address?</code>	<code>true</code> , <code>false</code>	<code>true</code>	If <code>true</code> , network drivers use their own MAC address, not the server MAC address.
<code>fcode-debug?</code>	<code>true</code> , <code>false</code>	<code>false</code>	If <code>true</code> , include name fields for plug-in device FCodes.
<code>scsi-initiator-id</code>	0-15	7	SCSI ID of the Serial Attached SCSI controller.
<code>oem-logo?</code>	<code>true</code> , <code>false</code>	<code>false</code>	If <code>true</code> , use custom OEM logo; otherwise, use Sun logo.
<code>oem-banner?</code>	<code>true</code> , <code>false</code>	<code>false</code>	If <code>true</code> , use custom OEM banner.
<code>ansi-terminal?</code>	<code>true</code> , <code>false</code>	<code>true</code>	If <code>true</code> , enable ANSI terminal emulation.
<code>screen-#columns</code>	0-n	80	Sets number of columns on screen.
<code>screen-#rows</code>	0-n	34	Sets number of rows on screen.
<code>ttya-rts-dtr-off</code>	<code>true</code> , <code>false</code>	<code>false</code>	If <code>true</code> , operating system does not assert <code>rts</code> (request-to-send) and <code>dtr</code> (data-transfer-ready) on serial management port.
<code>ttya-ignore-cd</code>	<code>true</code> , <code>false</code>	<code>true</code>	If <code>true</code> , operating system ignores carrier-detect on serial management port.

**TABLE A-1** OpenBoot Configuration Variables Stored on the System Configuration Card (Continued)

Variable	Possible Values	Default Value	Description
ttys-mode	9600,8,n,1,-	9600,8,n,1,-	Serial management port (baud rate, bits, parity, stop, handshake). The serial management port only works at the default values.
output-device	virtual-console, screen	virtual-console	Power-on output device.
input-device	virtual-console, keyboard	virtual-console	Power-on input device.
auto-boot-on-error?	true, false	false	If true, boot automatically after system error.
load-base	0-n	16384	Address.
auto-boot?	true, false	true	If true, boot automatically after power on or reset.
boot-command	<i>variable-name</i>	boot	Action following a boot command.
boot-file	<i>variable-name</i>	none	File from which to boot if diag-switch? is false.
boot-device	<i>variable-name</i>	disk net	Device(s) from which to boot if diag-switch? is false.
use-nvramrc?	true, false	false	If true, execute commands in NVRAMRC during server startup.
nvramrc	<i>variable-name</i>	none	Command script to execute if use-nvramrc? is true.
security-mode	none, command, full	none	Firmware security level.
security-password	<i>variable-name</i>	none	Firmware security password if security-mode is not none (never displayed). <i>Do not set this directly.</i>
security-#badlogins	<i>variable-name</i>	none	Number of incorrect security password attempts.

**TABLE A-1** OpenBoot Configuration Variables Stored on the System Configuration Card *(Continued)*

Variable	Possible Values	Default Value	Description
diag-switch?	true, false	false	If true: <ul style="list-style-type: none"><li>• OpenBoot verbosity is set to maximum</li><li>• After a boot request, boot diag-file from diag-device</li></ul> If false: <ul style="list-style-type: none"><li>• OpenBoot verbosity is set to minimum</li><li>• After a boot request, boot boot-file from boot-device</li></ul>
error-reset-recovery	boot, sync, none	boot	Command to execute following a system reset generated by an error.
network-boot-arguments	[ <i>protocol</i> , ] [ <i>key=value</i> , ]	none	Arguments to be used by the PROM for network booting. Defaults to an empty string. <code>network-boot-arguments</code> can be used to specify the boot protocol (RARP/DHCP) to be used and a range of system knowledge to be used in the process. For further information, see the <code>eeprom (1M)</code> man page or your Solaris Reference Manual..





# Index

---

## Symbols

`/etc/remote` file, 19  
modifying, 19

## A

Advanced Lights Out Manager (ALOM)

commands, *See* `sc>` prompt  
escape sequence (`#.`), 7  
logging in, 24  
multiple connections to, 6  
`sc>` prompt, *See* `sc>` prompt

ALOM commands

`disablecomponent`, 34  
`enablecomponent`, 34

ALOM, *See* Sun Advanced Lights Out Manager (ALOM)

alphanumeric terminal

accessing system console from, 21  
setting baud rate, 21

`auto-boot` (OpenBoot configuration variable), 8, 29

automatic system recovery (ASR)

about, 28  
commands, 31  
disabling, 32  
enabling, 31  
obtaining recovery information, 33

## B

`break` (`sc>` command), 9

Break key (alphanumeric terminal), 11

## C

Cisco L2511 Terminal Server, connecting, 16

command prompts, explained, 13

communicating with the system

about, 1  
options, table, 2

`console` (`sc>` command), 9

console configuration, connection alternatives  
explained, 6

`console -f` (`sc>` command), 7

## D

default system console configuration, 4

device identifiers, listed, 34

device reconfiguration, manual, 34

device unconfiguration, manual, 33

DHCP (Dynamic Host Configuration Protocol), 15

`disablecomponent` (ALOM command), 34

`dtterm` (Solaris utility), 19

Dynamic Host Configuration Protocol (DHCP)

client on network management port, 15

## E

`enablecomponent` (ALOM command), 34

environmental information, viewing, 25

error handling, summary, 29

escape sequence (`#.`), ALOM system controller, 7

## F

`fsck` (Solaris command), 10

- G**  
 go (OpenBoot command), 10  
 graceful system halt, 9, 11
- H**  
 halt, gracefully, advantages of, 9, 11
- I**  
 init (Solaris command), 9, 11  
 input-device (OpenBoot configuration variable), 22
- K**  
 keyboard sequences  
   L1-A, 8, 9, 11
- L**  
 L1-A keyboard sequence, 8, 9, 11  
 LEDs, Locator (system status LED), 27  
 Locator (system status LED)  
   controlling, 27  
   controlling from `sc>` prompt, 28  
 logging in to the Advanced Lights Out Manager (ALOM), 24
- M**  
 manual device reconfiguration, 34  
 manual device unconfiguration, 33  
 manual system reset, 10, 11  
 multiple ALOM sessions, 6
- N**  
 network management port (NET MGT)  
   activating, 14  
   configuring IP address, 15  
   configuring using Dynamic Host Configuration Protocol (DHCP), 15
- O**  
 ok prompt  
   about, 7  
   accessing via ALOM break command, 8, 9  
   accessing via Break key, 8, 9  
   accessing via graceful system shutdown, 9  
   accessing via L1-A (Stop-A) keys, 8, 9  
   accessing via manual system reset, 8, 10  
   risks in using, 10  
   suspension of Solaris operating environment, 10  
   ways to access, 8, 10
- OpenBoot commands  
   go, 10  
   probe-ide, 9  
   probe-scsi, 9  
   probe-scsi-all, 9  
   showenv, 37
- OpenBoot configuration variables  
   auto-boot, 8, 29  
   described, table, 37  
   input-device, 22  
   output-device, 22  
   system console settings, 22
- OpenBoot firmware  
   scenarios for control, 7  
 operating environment software, suspending, 10  
 output-device (OpenBoot configuration variable), 22
- P**  
 parity, 21  
 patch panel, terminal server connection, 16  
 poweroff (`sc>` command), 10  
 poweron (`sc>` command), 10  
 probe-ide (OpenBoot command), 9  
 probe-scsi (OpenBoot command), 9  
 probe-scsi-all (OpenBoot command), 9
- R**  
 reset  
   manual system, 10, 11  
   scenarios, 30  
 reset (`sc>` command), 10  
 run levels  
   explained, 7  
   ok prompt and, 7
- S**  
`sc>` commands  
   break, 9  
   console, 9  
   console -f, 7  
   poweroff, 10  
   poweron, 10

- reset, 10
- setlocator, 28
- setsc, 15
- showlocator, 28
- shownetwork, 16
- sc> prompt
  - about, 6, 23
  - accessing from network management port, 7
  - accessing from serial management port, 7
  - multiple sessions, 6
  - system console escape sequence (#.), 7
  - system console, switching between, 12
  - ways to access, 7
- serial management port (SERIAL MGT)
  - acceptable console device connections, 5
  - as default communication port on initial startup, 2
  - configuration parameters, 14
  - default system console configuration, 4
  - using, 13
- SERIAL MGT, *See* serial management port
- setlocator (sc> command), 28
- setsc (sc> command), 15
- showenv (OpenBoot command), 37
- shownetwork (sc> command), 16
- shutdown (Solaris command), 9, 11
- Solaris commands
  - fsc, 10
  - init, 9, 11
  - shutdown, 9, 11
  - tip, 18, 19
  - uadmin, 9
  - uname, 20
  - uname -r, 20
- suspending the operating environment software, 10
- system console
  - accessing via alphanumeric terminal, 21
  - accessing via terminal server, 16
  - accessing via Tip connection, 18
  - accessing with terminal server, 2
  - alphanumeric terminal connection, 2, 21
  - default configuration explained, 2, 4
  - default connections, 4
  - defined, 1
  - Ethernet attachment through network management port, 3
  - multiple view sessions, 7

- sc> prompt, switching between, 12
- setting OpenBoot configuration variables for, 22
- system reset scenarios, 30
- system status LEDs
  - Locator, 27, 28

## T

- terminal server
  - accessing system console from, 5, 16
  - connection through patch panel, 16
  - pinouts for crossover cable, 17
- tip (Solaris command), 19
- Tip connection
  - accessing system console, 18
  - accessing terminal server, 18

## U

- uadmin (Solaris command), 9
- uname (Solaris command), 20
- uname -r (Solaris command), 20

