



Sun™ Remote System Control (RSC) 2.2 User's Guide

For Supported Sun Workgroup Servers

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Preface

Sun Remote System Control (RSC) 2.2 User's Guide tells you how to configure and use Sun™ Remote System Control software. These instructions are designed for an experienced system administrator with networking knowledge.



Note – Because Sun Enterprise™ 250 servers have different RSC communication ports and firmware, RSC running on Sun Enterprise 250 servers has slightly different features from RSC running on other supported workgroup servers. In this manual, such differences are marked with a graphic taken from the Sun Enterprise 250 server front panel, shown to the left of this note.

How This Book Is Organized

This book contains the following chapters and appendixes:

- Chapter 1 “Sun Remote System Control (RSC) 2.2 Software” provides an overview of the product.
- Chapter 2 “Configuring RSC Software” tells you how to configure the software.
- Chapter 3 “Using the RSC Graphical User Interface (GUI)” tells you how to access the RSC GUI, and explains use of RSC windows and dialog boxes.
- Chapter 4 “Using the RSC Command Shell” provides detailed information about RSC commands and options.
- Chapter 5 “Using the rscadm Utility” provides information about the `rscadm` utility commands and options.
- Chapter 6 “Using OpenBoot PROM Features That Support RSC” provides information about OpenBoot PROM commands and environment variables.



- Chapter 7 “Troubleshooting” provides information about troubleshooting RSC problems, and troubleshooting the server using RSC.
- Appendix A “Installing and Configuring an Uninterruptible Power Supply (UPS)” provides an example of installing and configuring a UPS for use with RSC.
- Appendix B “Configuring the Sun Enterprise 250 Server RSC Serial Port Modem” provides information about configuring a modem attached to a Sun Enterprise 250 server RSC serial port.
- Appendix C “Creating a Script That Sends an Alert Message or RSC Event” provides a code example used to configure an RSC alert or event.
- Appendix D “RSC Event Codes” lists RSC event log codes.

Using UNIX Commands

This document does not contain information on basic UNIX® commands and procedures such as shutting down the system, booting the system, and configuring devices.

See one or more of the following for this information:

- *Solaris Handbook for Sun Peripherals*
- AnswerBook2™ online documentation for the Solaris™ operating environment
- Other software documentation that you received with your system

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.
AaBbCc123	What you type, when contrasted with on-screen computer output	% su Password:
<i>AaBbCc123</i>	Book titles, new words or terms, words to be emphasized	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.
	Command-line variable; replace with a real name or value	To delete a file, type <code>rm filename</code> .

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	#
Remote System Control shell	rsc>
OpenBoot PROM shell	ok

Related Documentation

Application	Title
PPP configuration	<i>Configuring and Using Solstice PPP Clients</i>
Performing diagnostic tests	<i>SunVTS User's Guide</i> <i>SunVTS Quick Reference Guide</i> <i>SunVTS Test Reference Manual</i> <i>Sun Management Center Software User's Guide</i>
System and network administration	<i>Solaris System Administrator AnswerBook</i> <i>SPARC: Installing Solaris Software</i>
Using operating system software	<i>Solaris User's Guide</i>

Accessing Sun Documentation Online

Online copies of *Sun Remote System Control (RSC) 2.2 User's Guide* are available in these locations after RSC installation:

- Solaris operating environment, PDF format: Use Adobe Acrobat Reader to open `/opt/rsc/doc/en/pdf/user_guide.pdf`
- Solaris operating environment, HTML format: Point your browser to `/opt/rsc/doc/en/html/index.html`
- Microsoft Windows operating environment, PDF format: Use Adobe Acrobat Reader to open `C:\Program Files\Sun Microsystems\Remote System Control\doc\en\pdf\user_guide.pdf`
- Microsoft Windows operating environment, HTML format: Point your browser to `C:\Program Files\Sun Microsystems\Remote System Control\doc\en\html\index.html`

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Sun Remote System Control (RSC)

2.2 Software

Sun Remote System Control (RSC) 2.2 software is a server management tool that allows you to monitor and control servers over modem lines and over a network. RSC provides remote system administration for geographically distributed or physically inaccessible systems. RSC 2.2 software works with the RSC card included in supported Sun workgroup servers released after 1999 and also with RSC hardware included with Sun Enterprise 250 servers. For information about supported servers, click on Server Types in the RSC graphical user interface.



Note – Because Sun Enterprise 250 servers have different RSC communication ports and firmware, RSC running on Sun Enterprise 250 servers has slightly different features from RSC running on other supported workgroup servers. In this manual, such differences are marked with a graphic taken from the Sun Enterprise 250 server front panel, shown to the left of this note.

Online copies of *Sun Remote System Control (RSC) 2.2 User's Guide* are available in these locations after RSC installation:

- Solaris operating environment, PDF format: Use Adobe Acrobat Reader to open `/opt/rsc/doc/en/pdf/user_guide.pdf`
- Solaris operating environment, HTML format: Point your browser to `/opt/rsc/doc/en/html/index.html`
- Microsoft Windows operating environment, PDF format: Use Adobe Acrobat Reader to open `C:\Program Files\Sun Microsystems\Remote System Control\doc\en\pdf\user_guide.pdf`
- Microsoft Windows operating environment, HTML format: Point your browser to `C:\Program Files\Sun Microsystems\Remote System Control\doc\en\html\index.html`

RSC Access

You can access RSC from a workstation running the Solaris, Microsoft Windows 98, Windows 2000, or Windows NT operating environment and Sun's RSC Java™ application, or from an ASCII terminal or device running ASCII terminal emulation software. FIGURE 1-1 shows remote access paths to RSC.

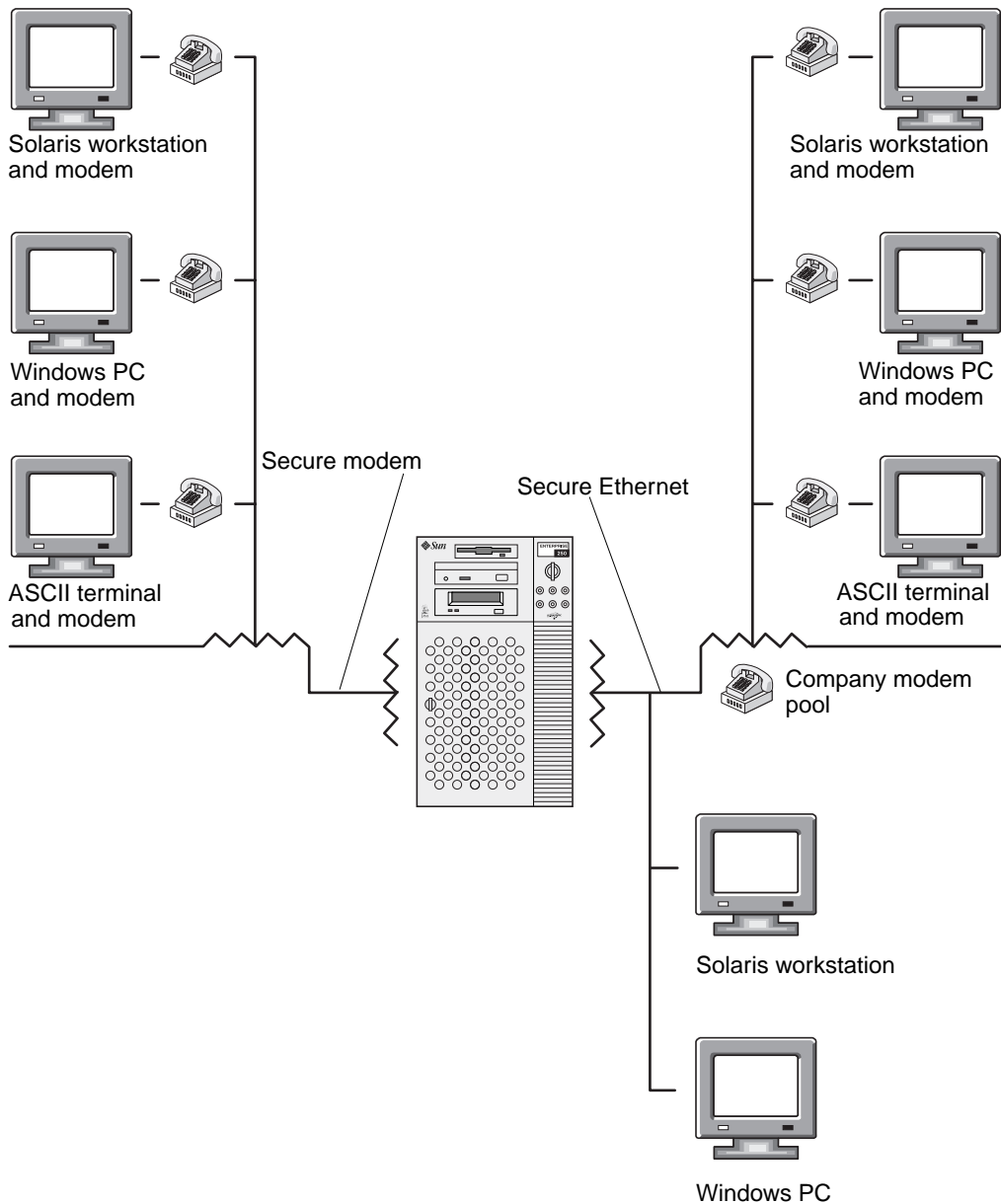


FIGURE 1-1 RSC Remote Access Paths

After RSC software is installed and configured to manage your server, you can use it to run diagnostic tests, view diagnostic and error messages, reboot your server, and display environmental status information from a remote console.

The RSC firmware runs independently of the host server, and uses standby power drawn from it. The RSC card also includes a battery that provides approximately 30 minutes of power to RSC in case of a power failure. Therefore, RSC hardware and software continue to be effective when the server operating system goes offline, and can send notification of hardware failures or other events that may be occurring on your server. Use of an uninterruptible power supply extends this capability.



Note – RSC hardware for Sun Enterprise 250 servers does not include a backup battery.

The server can boot and operate normally when RSC software is not enabled, and Sun console features continue to be available on standard RS232 ports.

RSC Features

RSC has the following features:

- View of the server's front panel including keyswitch position and LEDs
- Remote system monitoring and error reporting, including output from power-on self-test (POST) and OpenBoot™ Diagnostics
- Remote server reboot, reset, power-on, and power-off on demand
- Ability to monitor fan sensors and the temperatures of CPUs, disks, and other components without being near the managed server
- Ability to run diagnostic tests from a remote console
- Remote event notification of server problems
- A detailed log of RSC events
- Remote console functions available through both the Ethernet port and modem
- Personal Computer Memory Card International Association (PCMCIA) modem on the RSC card
- RSC battery backup on the RSC card that allows RSC use after a complete power failure



Note – RSC hardware for Sun Enterprise 250 servers does not include a backup battery or PCMCIA modem; you can connect a modem to the RSC serial port.

RSC complements existing Sun monitoring and diagnostics tools such as Solstice™ Sun Management Center, SunVTS™, the kadb kernel debugger, OpenBoot PROM, and OpenBoot Diagnostics. Sun Management Center operation remains unchanged, and it continues to be the main tool for observing system operation and performance while the server operating system is running.

RSC Use

After installing and configuring Sun Remote System Control software on the server and client systems, you may use an OpenBoot PROM command and set OpenBoot PROM variables to redirect the console output to RSC.

Part of RSC configuration defines and enables *alert* mechanisms. Alerts provide remote notification of system problems and can be sent to pagers or an email address. RSC also sends alerts to any clients that are currently logged in to RSC.

Note – For sending pager alerts, RSC is designed to operate with any modem paging service that complies with the Telocator Alphanumeric Protocol (TAP).

RSC sends an alert message whenever any of the following occurs:

- The server system resets.
- Server temperature crosses the lower-fault (high temperature warning) limit.
- Server temperature crosses the upper-fault (high temperature shutdown) limit.
- A server redundant power supply fails.
- The RSC card's power status changes to battery power.
- The RSC card's battery power is low.
- RSC receives a server-generated alert.
- The server undergoes a hardware watchdog reset.
- RSC detects five unsuccessful RSC login attempts within five minutes.



Note – RSC hardware for Sun Enterprise 250 servers does not include a backup battery.

Each alert message includes the server name and other important details, including time, date, and a description of the event. RSC configuration controls whether an alert is sent to an email address, to pagers, or to both. In addition, an alert is always sent to any clients currently logged in to RSC accounts for that server, and to the RSC event log. FIGURE 1-2 shows RSC remote alert paths.

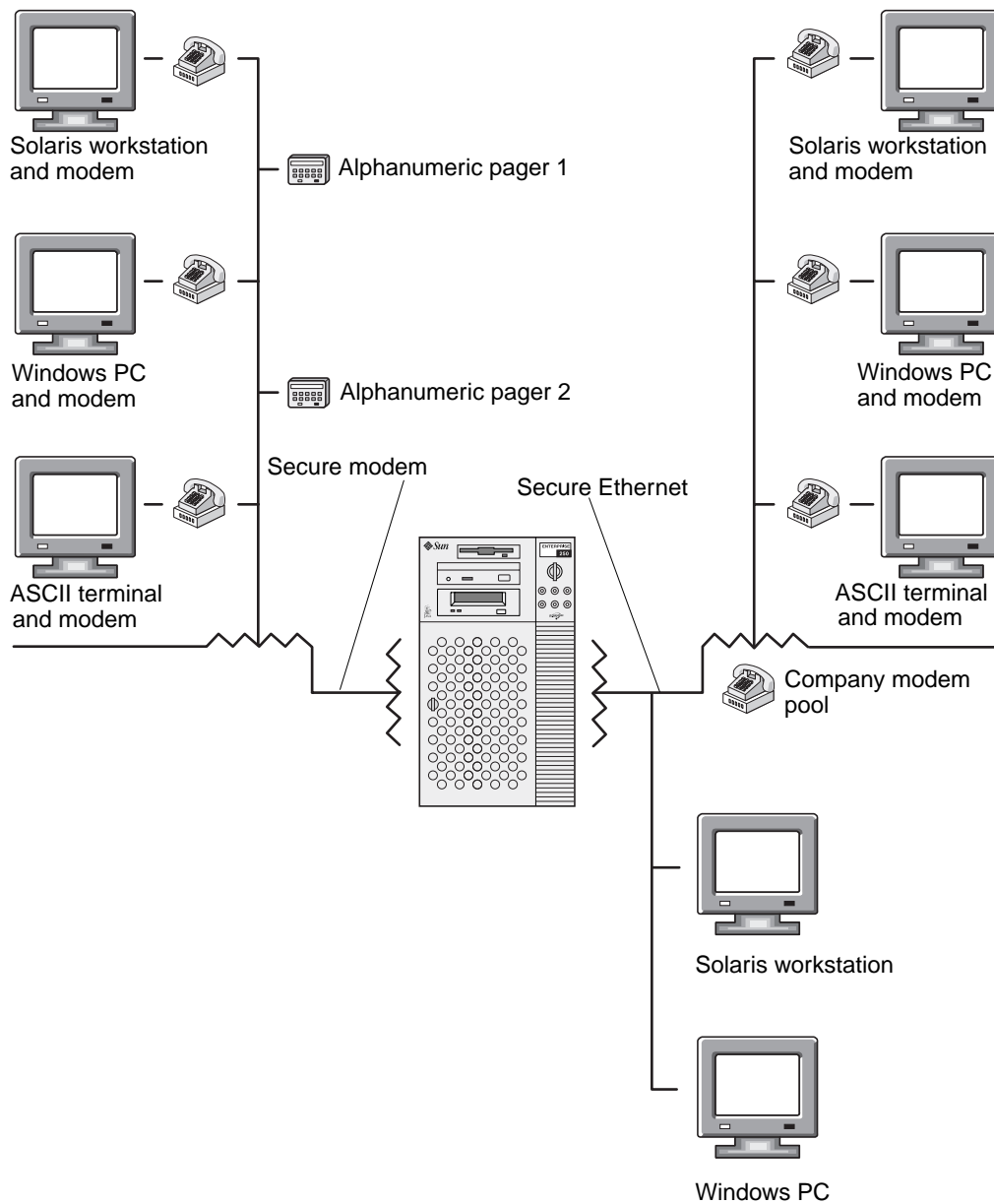


FIGURE 1-2 RSC Remote Alert Paths

After receiving an alert message, you can connect to your RSC account for the server that caused the alert. Then you can check console messages to determine whether the server has recovered and is running, or whether the server operating system is down.

If the server is running, you can log in to it and debug the system using UNIX system administration tools such as SunVTS and Sun Management Center. If the server is not running, or if UNIX system administration tools are not available, you can use the RSC remote console feature to debug the server. After diagnosing a problem, you can schedule server downtime and service, if necessary.

RSC Capabilities

RSC provides the following capabilities for remotely monitoring and controlling supported Sun workgroup servers.

Server Status and Control

- Show server environmental status.
- Toggle the locator LED (Sun Fire V480 servers only)
- Access a console that makes all UNIX console functions available to the user.
- Send a break to put the server into debug mode.
- Control the diagnostics level for a server reboot.
- Reset the server on demand. When the system is not responding, you can issue a reset to bring the server back online.
- Turn server power off and on.

View Logs

- Display a detailed log of RSC events and detected errors.
- Display and reset server console logs.

RSC Configuration

You can control RSC configuration settings for:

- Alerts
- Ethernet port
- RSC modem (for Sun Enterprise 250 servers, RSC serial port)
- RSC date and time
- Your RSC password
- RSC user accounts



After installation, you run a script file that guides you through basic configuration. See Chapter 2.

You can extend the amount of time you can use RSC beyond the RSC battery life by using a UPS (recommended). See Appendix A.



Note – RSC hardware for Sun Enterprise 250 servers does not include a backup battery.

User Interfaces

RSC user interfaces include:

- A graphical user interface (GUI) that runs using Sun's RSC Java application
- A command-line interface (CLI) you can access using a serial port and telnet, or by using PPP (point-to-point protocol) and a standard modem connection

RSC supports a total of four concurrent telnet sessions per server, including command-line interface sessions and a graphical user interface (GUI) connection to the server console (Open Console). In addition, RSC supports up to four active concurrent RSC GUI sessions.



Note – Sun Enterprise 250 servers support two concurrent telnet sessions and three active concurrent RSC GUI sessions.

RSC Security

The hardware and process required for you to log in to an RSC account on a managed server depend on company security practices, and whether the serial port, Ethernet, or modem dial-in are used. Further security is provided by RSC accounts, individual account access rights, and passwords. In addition, RSC records all logins and sends an alert if it detects more than five login failures within five minutes.

Characteristics of the modem settings and phone line connection to RSC determine access security for modem connections. For instance, use of a dial-back option or a phone line that supports dial-out only can increase security.



Caution – For purposes of security, do not leave your session unattended. Always use the RSC `logout` command before disconnecting your session. In addition, before logging out of RSC, take care to log out of any server sessions you initiate while using the RSC console.

RSC Client Requirements

To use the RSC graphical user interface, a client must have Sun's RSC Java application installed; this is provided during installation. To use the RSC command shell, a client must be an ASCII character terminal or have ASCII character terminal emulation software installed.

Configuring RSC Software

This chapter provides information about how to configure Sun Remote System Control (RSC) software. For installation instructions, see the instructions that accompany your release media. Downloadable software is also available at the following web site: <http://www.sun.com/servers/rsc.html>.

The RSC configuration script allows you to set up RSC configuration. You can change RSC configuration after initial configuration using RSC shell commands, the RSC graphical user interface (GUI), or the `rscadm` utility. However, before running the configuration script, you must decide how you will use RSC software to manage your server. The basic decisions you need to make are:

- Which RSC communication ports to enable
- Whether to enable alert messages, and by what means

Choosing RSC Communication Ports

RSC has three dedicated communication ports on the rear of the RSC card: a serial port, an Ethernet port, and a connector to RSC's PCMCIA internal modem. RSC can use any or all of these to communicate with users. You can connect the serial port to an ASCII terminal or workstation, or to a terminal "concentrator"; see your hardware owner's guide for more information.



Note – Sun Enterprise 250 servers have an RSC Ethernet port and an RSC serial port, but no internal modem. You can connect an external modem to the RSC serial port. See Appendix B.

RSC Ethernet Port

The RSC Ethernet port, when connected to your local Ethernet, is most useful for accessing RSC from within your company network. You can connect to RSC remotely using any standard telnet and PPP (point-to-point protocol) clients with TCP/IP (Transmission Control Protocol/Internet Protocol). For example, you may use a pool of modems attached to a terminal server running PPP.

RSC Modem

You can use the RSC modem to send alerts to pagers. For sending pager alerts, RSC is designed to operate with any modem paging service that complies with the Telocator Alphanumeric Protocol (TAP).



Note – Sun Enterprise 250 servers have an RSC serial port to which you can connect an external modem.

To use the RSC GUI, users must have RSC client software installed on their machines. If an incoming connection uses PPP, then RSC can support several remote user sessions simultaneously. Otherwise, only one remote user can be active at a time.

RSC Serial Port

The RSC serial port allows access to the RSC command line interface (CLI). You can connect an ASCII terminal or a workstation to the serial port, or you can connect a serial line to a workstation or PC that is running a terminal emulator. You can also connect a terminal server or a concentrator port to the serial port.

Choosing Alert Message Types

When a server problem occurs, RSC sends an alert message. RSC always sends alert messages to all users who are logged in to RSC accounts on that server.

You can also configure RSC to send alerts to people who are not logged in to RSC accounts on that server. These additional alerts can be sent to an email address, to alphanumeric pagers, or to both. After receiving an alert, an RSC user can connect to their RSC account for that server and address the alert condition.

Email Alerts

If the RSC Ethernet port is enabled, you can set an email address to use for alerts. Although only a single email address is permitted, you can notify several people that a problem has occurred by using an email alias or mailing list.

Pager Alerts

If the RSC modem is enabled and connected, you can page one or two alphanumeric pagers when an alert occurs. Use this alert mechanism if your system administrators typically carry pagers. For sending pager alerts, RSC is designed to operate with any modem paging service that complies with the Telocator Alphanumeric Protocol (TAP).



Note – Sun Enterprise 250 servers have an RSC serial port to which you can connect an external modem.

Planning Configuration Settings

After deciding which communication ports to enable and how to configure alerts, write down your planned responses to the RSC configuration script system prompts shown below. After you have recorded this information, you can refer to it when you configure RSC software on the server. If some of this information is not available yet or changes, you can use RSC interfaces or the `rscadm` utility to change your configuration after installation.

- Server hostname (40 characters maximum, including alphanumeric characters and hyphen):



Note – For Sun Enterprise 250 servers, the server hostname and customer information strings are limited to eight characters.

- Customer information string to identify the server in alert messages (40 characters maximum, including alphanumeric characters and hyphen):

You may want to use the server's service contract number (recommended), location, system administrator's name, or responsible department as customer information.

- Do you want to enable Ethernet connection to RSC? (y | n):

- *If you will enable the Ethernet connection, how do you want to control network configuration? Configure manually or use Dynamic Host Configuration Protocol (DHCP) protocol for a DHCP server:*
 - Configure the network manually if you want to enter Internet addresses
 - Choose DHCP if you want to use DHCP protocol and a DHCP server to assign appropriate network configuration settings.

Note – Sun recommends setting the RSC device name associated with the Internet address in name server maps (either NIS or DNS) to be the name of the server with `-rsc` appended to it. For instance, if your server's hostname is `bert`, the recommended name to assign to the RSC device for that server is `bert-rsc`. Sun also recommends that if you use DHCP, you configure the DHCP server to assign a fixed IP address to RSC.

- *If RSC will use configured Ethernet protocol:*
 - Internet address for RSC:
 - Internet address for the subnet mask:
 - Internet address for the default gateway to use when the destination is not on the same subnet as RSC:
- Do you want RSC to send alerts when problems occur? (y|n):
- Do you want RSC to send alert messages by email? (y|n):
- *If you want RSC to send alert messages by email:*
 - Internet address for Simple Mail Transfer Protocol (SMTP) mail server:
 - Internet address for backup SMTP mail server (optional):
 - Email address to use:
- Do you want RSC to send alert messages to a pager? (y|n):
- Do you want to enable verbose alerts, which may not be allowed by some pagers or paging services? (y|n):



Note – For Sun Enterprise 250 servers, verbose alerts are enabled and you cannot limit the length of pager alert messages.

- *If you want RSC to send alert messages to a pager:*
 - Pager 1 telephone number:
 - Pager 1 modem initialization string:
 - Pager 1 account password:
 - Pager 1 baud rate:
 - Pager 1 data bits:

- Pager 1 parity:
- Pager 1 stop bits:
- Do you want RSC to send alert messages to an additional pager? (y | n):
- *If you want RSC to send alert messages to an additional pager:*
 - Pager 2 telephone number:
 - Pager 2 modem initialization string:
 - Pager 2 account password:
 - Pager 2 baud rate:
 - Pager 2 data bits:
 - Pager 2 parity:
 - Pager 2 stop bits:
- Do you want to enable the RSC modem? (y | n):



Note – Sun Enterprise 250 servers use the RSC serial port for modem connection. If you are configuring RSC on a Sun Enterprise 250 server, the configuration script asks if you want to enable the RSC serial port, and if you respond yes it prompts for a value for serial port baud rate, serial data bits, serial parity, serial stop bits, whether to use hardware handshaking, and whether to enable PPP over the RSC serial port.

- *If you will enable the RSC modem:*
 - Modem data bits:
 - Modem parity:
 - Modem stop bits:
 - Do you want to enable PPP over the RSC modem? (y | n):
- *If you will enable PPP:*
 - PPP local IP address (if not dynamically configured):
 - PPP remote IP address (if not dynamically configured):
- Do you want to set up an RSC user account during installation? (y | n):
- *If you will set up an RSC user account during installation:*
 - Account username:
 - Permission level for the user: (a, u, c, r, none):
 - Account password:

See Chapter 4 for information about account usernames, permissions, and passwords.

Running the Server Configuration Script

After you have installed RSC software on the server and decided how you want to configure RSC, log in to the server as root and run the configuration script using the following command:

```
# /usr/platform/platform-name/rsc/rsc-config
```

You can obtain the string to use for *platform-name* using the Solaris command `uname -i`. For example:

```
% uname -i  
SUNW,Sun-Fire-280R
```

The script prompts you for configuration information. Some prompts may not appear, depending on choices you make. To respond to the prompts, refer to the information you recorded following the instructions in “Planning Configuration Settings” beginning on page 13.

Prompts relating to enabling alerts, the RSC Ethernet port, or the RSC modem include a `skip` option. This option is useful only if you run the script again after initial configuration to change selected options of the RSC configuration. When you choose `skip` when running the script after initial configuration, configuration for that option will not change. If you choose `skip` and that option has not been previously set, RSC uses the default setting (shown in brackets).

After you have responded to all configuration setting prompts, the configuration script displays a summary for each section of the procedure and asks whether it is correct. For each section, respond **y** or **yes** to confirm your choices, or respond **n** or **no** to revisit that section of the configuration procedure.

When you have confirmed all sections, the configuration procedure updates the RSC flash PROM.



Caution – It takes a few minutes to update the RSC flash PROM. Do not interrupt this process by aborting the configuration procedure or removing system power. If the update is interrupted, you must restart the configuration script, and it must complete successfully, before RSC can function properly.

After setting up RSC as you specified, the configuration procedure prompts you for the password for the user account, if you chose to create a user account. Then it prompts you to repeat the password.

Finally, the procedure asks if you want to reset RSC. A reset is required before Ethernet configuration takes effect. This completes RSC server software configuration.

Redirecting the Console to RSC

After RSC software is installed and configured, the system console is still available as on any normal Sun machine. To enable RSC as the system console device instead, you must access the server console, shut down the system, and type the following commands at the ok prompt:

```
ok diag-console rsc

ok setenv input-device rsc-console

ok setenv output-device rsc-console
```



Note – For Sun Enterprise 250 servers, use the following commands at the ok prompt: `diag-output-to rsc`, `setenv input-device rsc`, `setenv output-device rsc`. Also, use `diag-output-to ttya` in the next example below.

These commands take effect after the next server reset. At any time, you can use the following command to remove RSC as the default console:

```
ok diag-console ttya
```

If your server has a keyboard and monitor, you also need to type the following commands after removing RSC as the default console:

```
ok setenv input-device keyboard

ok setenv output-device screen
```

If RSC is not designated as the system console, you cannot use RSC to access the console. You can temporarily redirect the console to RSC using the RSC `bootmode -u` command, or by choosing Set Boot Mode using the RSC GUI and checking the box labeled “Force the host to direct the console to RSC.” These methods affect the next boot only.

After initial configuration, you can control configuration and add or modify user accounts by using the GUI or RSC shell commands. You can also log in to the host as root and use the `rscadm` utility to control RSC configuration and user accounts; see Chapter 5.

If you are using an uninterruptible power supply (UPS) for the host, you must configure it properly. For an example of UPS configuration, see Appendix A.

Configuring Point-to-Point Protocol (PPP)

If PPP is enabled on the modem, RSC supports multiple sessions, either shell or GUI, through one modem connection. If PPP is not enabled, you can run only one session over the modem, and it must be a shell session. RSC supports multiple sessions over its Ethernet port.

To use PPP for dialing in to the RSC modem, the RSC configuration variable `ppp_enabled` must be set to `true`, or PPP must be enabled using the RSC GUI. In addition, you must configure PPP on each client machine that will use PPP to dial in to RSC accounts on the RSC modem.

Configuring PPP on the Client

To allow connection to RSC from a remote client using PPP, you must configure PPP on the client. For a Solaris client, see *Configuring and Using Solstice PPP 4.0 Clients*. For a Microsoft Windows client, see your Microsoft Windows documentation.

The Solstice PPP client configuration script `/usr/bin/pppinit` creates a CHAT script in `/etc/opt/SUNWconn/ppp/script` that defines the dialog that occurs between a client and server during the connection phase. The contents of this CHAT script are not needed to establish a PPP connection to RSC. In order to successfully establish connection to RSC from a Solstice PPP client, comment or delete the contents of the CHAT script, but do not delete the file.

Completing Alert Configuration

To complete alert configuration, choose Configure Alerts in the GUI, or set the following configuration variables using the RSC shell or `rscadm` utility:

- `customerinfo`
- `hostname`
- `page_enabled`
- `mail_enabled`
- `page_info1`
- `page_info2` (optional)
- `mailuser`
- `mailhost`
- `page_verbose`

The GUI provides help for configuring RSC alerts. For help configuring RSC alert variables in the shell, see “Alert Variables” on page 51. RSC generates alert messages with the following format:

```
$HOSTID $EVENT $TIME $CUSTOMERINFO $HOSTNAME message
```

You can also use the `rscadm` subcommand `send_event -c` to send a customized alert at any time. You can do this directly at the superuser prompt, and you can also create a command file that runs and sends the alert under special circumstances. See Appendix C.

Backing Up RSC Configuration

You should periodically use `rscadm` commands to create a backup file that records RSC configuration settings on a remote system. For example (after setting your path to the `rscadm` utility):

```
# rscadm show > remote-filename  
  
# rscadm usershow > remote-filename  
  
#
```

Use a meaningful file name that includes the name of the server that RSC controls.

Later, you can refer to this file to restore the settings if you need to reinstall RSC software on the server or replace RSC hardware.

Using the RSC Graphical User Interface (GUI)

This chapter explains how to access the RSC GUI (graphical user interface) and use the RSC windows and dialog boxes. If you need to use RSC commands and the GUI is not available, you can use RSC shell commands. After you log in to your RSC account from a terminal window, the RSC shell prompt appears (*rsc>*), and you can enter commands.

Starting the RSC GUI

If you are using a client running the Solaris operating environment, start the RSC GUI by entering this command:

```
% /opt/rsc/bin/rsc
```

If you are using a client running the Microsoft Windows 95, Windows 98, or Windows NT operating environment, follow these steps to start the RSC GUI:

1. **Click on the Start menu.**
2. **Select Programs in the Start menu.**
3. **Click on Remote System Control.**

When the login screen appears, it prompts you to enter an RSC device name or IP address, your RSC username, and your password.

Note – Enter the name or IP address of the RSC device, not the name or IP address of the server. If you enter the server name instead of the RSC device name, the interface searches for the name you entered, and if necessary it also searches for the name with `-rsc` appended; if neither search is successful, RSC returns an error message.

To simultaneously monitor or control more than one server, start a separate GUI session for each server.

Note – If you have created a shortcut to RSC, you can start the RSC GUI by double-clicking the Remote System Control icon.

Accessing RSC Functions

The main screen of the Sun Remote System Control GUI lets you access the following functions:

- Server Status and Control
 - Show Environmental Status
 - Toggle Locator LED (Sun Fire 480R servers only)
 - Open Console
 - Send Break
 - Send XIR
 - Set Boot Mode
 - Reset Server
 - Power Off/On (depends on current setting)
- View Logs
 - RSC Event Log
 - Original Console Boot Log
 - Original Console Run Log
 - Console Boot Log
 - Console Run Log
 - Reset Console Logs

- RSC Card Configuration
 - Alert Settings
 - Ethernet Settings
 - Communications Settings
 - Set RSC Date and Time
 - Change Password
 - User Administration
 - Reset RSC
- Help
 - Help Topics
 - About RSC

Online Help is available when you use the GUI. Additional detail about RSC functions is provided in the sections of Chapter 4 that describe the corresponding RSC shell commands.

RSC Permissions Required for Access to GUI Functions

All RSC users can look at RSC information. The table in the RSC User Administration dialog box shows additional permissions assigned to each user. These additional user permissions grant access to specific items in the GUI command tree.

Admin. Permission

Admin. permission allows the user to modify RSC configuration, including the following items in the command tree:

- Alert Settings
- Ethernet Settings
- Communications Settings
- Set RSC Date and Time
- Reset Console Logs
- Reset RSC

User Permission

User permission allows the user to choose User Administration in the command tree to add, modify, and remove RSC user accounts.

Console Permission

Console permission allows the user to choose Open Console in the command tree and connect to the server console, and to choose Send Break to put the server in debug mode.

Reset Permission

Reset permission allows the user to use the following items in the command tree:

- Send XIR
- Set Boot Mode
- Reset Server
- Power Off or Power On
- Toggle Locator LED (Sun Fire V480 servers only)

Read-Only Permission

If no user permissions are checked, the user's permission is read-only. A user with read-only permission can use the following options only:

- Show Environmental Status
- View Logs options (except Reset Console Logs)
- Ethernet Settings (read only)
- Change Password (current user's own password only)
- Help Topics
- About RSC

Using the RSC Command Shell

The RSC command shell is a simple command-line interface that supports commands that allow you to administer or diagnose the server. It also has commands for configuring RSC.

RSC supports a total of four concurrent telnet sessions per server, including command-line interface sessions and a graphical user interface (GUI) connection to the server console (Open Console). In addition, RSC supports up to four active concurrent RSC GUI sessions.



Note – Sun Enterprise 250 servers support two concurrent telnet sessions and three active concurrent RSC GUI sessions.

After you log in to your RSC account, the RSC shell prompt appears (`rsc>`), and you can enter RSC shell commands. This chapter tells you how to log in to your RSC account and describes RSC command use and syntax.

The following table summarizes RSC shell commands. Each command is explained in greater detail in the following sections.

TABLE 4-1 RSC Shell Commands

Name	Description
<code>environment</code>	Displays current environmental information
<code>showenvironment</code>	Same as <code>environment</code>
<code>shownetwork</code>	Displays the current network configuration
<code>console</code>	Connects you to the server console
<code>break</code>	Puts the server in debug mode
<code>xir</code>	Generates an externally initiated soft reset to the server
<code>bootmode</code>	Controls server firmware behavior, if followed by a server reset within 10 minutes (similar to L1-key combinations on non-USB Sun keyboards)

TABLE 4-1 RSC Shell Commands (*Continued*)

Name	Description
reset	Resets the server immediately
poweroff	Powers off the server
poweron	Powers on the server
loghistory	Displays the history of all events logged in the RSC event buffer
consolehistory	Displays the history of all console messages logged in the buffer
consolerestart	Makes the current boot and run console logs “original”
set	Sets a configuration variable
show	Displays one or more configuration variables
date	Displays or sets the current time and date
showdate	Same as date command without arguments
setdate	Same as date command with arguments
password	Changes your RSC password
useradd	Adds an RSC user account
userdel	Deletes an RSC user account
usershow	Shows characteristics of an RSC user account
userpassword	Sets or changes a user’s password
userperm	Sets the authorization for a user
resetrsc	Resets RSC immediately
help	Displays a list of RSC shell commands and a brief description of each
version	Displays version number for RSC firmware and components
showsc	Same as version without the -v option
logout	Ends your current RSC shell session
setlocator	Turn the system locator LED on or off (Sun Fire V480 servers only).
showlocator	Show the state of the system locator LED (Sun Fire V480 servers only).



Note – For Sun Enterprise 250 servers, the following shell command aliases are not available: showenvironment, showdate, setdate, and showsc.

More detailed descriptions of the commands are provided in the following sections.

Note – Some commands require a specific user permission level. See “userperm username [a][u][c][r]” on page 43 for information about user permission levels.

Logging In to Your RSC Account

After RSC software is installed and configured and an account has been set up for you, you can connect to RSC and log in to your account using a Solaris workstation, Microsoft Windows PC, standard ASCII character terminal, or a computer running ASCII terminal emulation software.

Follow these steps to log in to your RSC account:

1. Connect to RSC using one of these methods:

- a. Use point-to-point protocol (PPP) to connect to your company Ethernet, and then use the `telnet` command to connect to RSC.**

Ask your network administrator if you do not know the server’s RSC name (Sun recommends the name *servername-rsc*). Note that, unlike the graphical user interface, the command-line interface does not attempt to connect to RSC by appending `-rsc` to the name you enter if that name fails.

- b. If you are already connected to your company Ethernet, use the `telnet` command to connect to RSC.**

- c. Use PPP to connect to the RSC modem. To use this option, PPP must be enabled.**

- d. If PPP is not enabled, dial in to the RSC modem.**

When connection is established, the following screen appears:

```
RSC software version 2.0.0 (server-name)

Please login:

Please enter password:
```

- e. If your server has an RSC serial port, connect an ASCII terminal directly to the RSC serial port.**

Note – To use this method on Sun Enterprise 250 servers, you must disable PPP by using the RSC shell, RSC GUI, or the `rscadm` utility to set the `ppp_enabled` configuration variable to false.

2. When connection is established, type your RSC login name.

3. Type your RSC password.

Your password is not echoed on the screen. After you correctly enter your password, RSC displays this command prompt:

```
rsc>
```

You can enter RSC shell commands at the `rsc>` prompt.

Logins are recorded in the RSC event log. In addition, RSC sends an alert if it detects more than five login failures within five minutes. Except for Sun Enterprise 250 servers, RSC automatically disconnects a session after 10 minutes of user inactivity.

Note – For Sun Enterprise 250 servers, you can set RSC to disconnect a session connected to the serial port after 10 minutes of inactivity; see information for the configuration variable “`serial_hw_handshake`” on page 92.

Server Status and Control Commands

The following RSC commands show server status or control server operation:

- `environment` (or `showenvironment`)
- `shownetwork`
- `console`
- `break`
- `xir`
- `bootmode`
- `reset`
- `poweroff`
- `poweron`

- `setlocator`
- `showlocator`

environment

Use the `environment` command to display a snapshot of server environmental status, such as temperatures, power supply status, front panel LED status, keyswitch position, and so forth. You can also use the command abbreviation `env`. The display uses similar format to that used for the UNIX command `prtdiag(1m)`.

For example:

```
rsc> environment

===== Environmental Status =====

System Temperatures (Celsius):
-----
      CPU0      60
      CPU1      57
      RSC       30

=====

RSC Power Status:
-----

RSC is running on Normal System Power

RSC Battery Voltage: 4.18V

=====

Front Status Panel:
-----

Keyswitch position is in On mode.

=====

System LED Status: GENERAL ERROR      POWER
                   [OFF]              [ ON]

Disk LED Status:   OK = GREEN  ERROR = YELLOW
      DISK 1:      [OK]
      DISK 0:      [OK]

=====

Fan Bank:
-----

Bank      Speed      Status
      (0-255)
-----
  SYS      151        OK

=====
```

```

Power Supplies:
-----

Supply      Status
-----
    1          OK: 560w

=====

rsc>

```

The display differs according to the server model and configuration. Note that some environmental information may be unavailable when the server is in Standby mode.

showenvironment



The `showenvironment` command is the same as the `environment` command. (Not available for Sun Enterprise 250 servers.)

shownetwork

The `shownetwork` command displays the current network configuration. For example:

```

rsc> shownetwork
RSC network configuration is:
DHCP server: 129.149.2.3
IP Address: 129.149.2.6
Gateway Address: 129.149.2.7, 129.149.2.8
Netmask: 255.255.255.0
Ethernet Address: ae:30:30:00:00:01
rsc>

```

console

Use the `console` command to enter RSC console mode and connect to the server console from the RSC shell. When you use this command, the system displays a standard Solaris login prompt. If RSC is not designated as the server console, nothing is displayed.

You must have **C** level user permission to use this command. An escape character sequence is used to return to the RSC prompt. The default escape sequence is `~.` (tilde period). See “`escape_char`” on page 57.

break

Use the `break` command to put the server into Debug mode. You must have **C** level user permission to use this command. The server front panel keyswitch must not be in the Lock position, and RSC must be designated as the console (see Chapter 6). Debug mode can use either `kadb` or OpenBoot PROM, depending on server configuration.

xir

This command generates the equivalent of an externally initiated reset (XIR) of the server. You must have **R** level user permission to use this command. The server enters OpenBoot PROM mode and displays the `ok` prompt. This command is useful for driver or kernel debugging, as most of the contents of the server’s memory and registers is preserved. To resume operation of the system after using the `xir` command, you must reboot the server.

```
bootmode [-u]
[normal|forth|reset_nvram|diag|
skip_diag]
```

This command provides control over the server firmware behavior after a server reset. Functionality of this command is identical to that available on non-USB Sun keyboards using L1 key combinations. You must have **R** level user permission to use this command. If you use the `bootmode` command without arguments, RSC displays the current boot mode.

The `bootmode` setting overrides the server’s OpenBoot Diagnostics `diag-switch?` setting immediately after the next reset only. If RSC does not detect a server reset within 10 minutes, the `bootmode` command is ignored. For example:

```
rsc> bootmode forth

rsc> reset
```


To set the `diag` or `skip_diag` option, you must follow the `bootmode` command with the `poweroff` and `poweron` commands within 10 minutes. For example:

```
rsc> bootmode skip_diag

rsc> poweroff

rsc> poweron
```

To force console input and output to RSC, use the `-u` option before specifying the boot mode. This is the equivalent of using the OpenBoot PROM commands shown in “Redirecting the Console to RSC” on page 17, but affects the next boot only.

The following table describes modes you can specify using the `bootmode` command.

TABLE 4-2 Modes Used With the `bootmode` Command

Mode	Description
<code>-u</code>	Force the server to direct the console to RSC; the <code>-u</code> option must precede any boot mode you specify; requires server reset
<code>normal</code>	Normal boot; server runs low-level diagnostics; requires server reset
<code>forth</code>	Enter Forth interpreter as soon as possible (equivalent to L1-F on non-USB keyboards); requires server reset
<code>reset_nvram</code>	Reset all NVRAM variables to default values (equivalent to L1-N on non-USB keyboards); requires server reset
<code>diag</code>	Force the server to run full diagnostics (equivalent to L1-D on non-USB keyboards); requires server power-off and power-on
<code>skip_diag</code>	Force the server to skip diagnostics (equivalent to L1-S on non-USB keyboards); requires server power-off and power-on

Note – The `diag` and `skip_diag` modes take effect only if you follow the `bootmode` command with the `poweroff` and `poweron` commands within 10 minutes.

reset

This command forcibly resets the server immediately. You must have R level user permission to use this command. The server reboots according to the server's designated boot mode. The `reset` command does not perform a clean shutdown of the system, and data may be lost. When possible, use the corresponding Solaris administration command instead.

Note – The default configuration of Sun workgroup server firmware does not invoke POST when the server resets. However, you can change this behavior through NVRAM variable settings; for additional details, see the Platform Notes for your server.

poweroff

Use the `poweroff` command to power off the server. You must have R level user permission to use this command. This command has no effect if the server is already powered off. RSC remains available since it uses the server's standby power. Note, however, that some environmental information may be unavailable when the server is in Standby mode.

The `poweroff` command attempts to perform a clean shutdown of the system. However, when possible, use the corresponding Solaris administration command instead.

It can take up to 35 seconds for the `poweroff` command to completely shut down the system (except on Sun Enterprise 250 servers). This is because RSC waits for a clean shutdown to complete before `poweroff` can occur.



Note – For Sun Enterprise 250 servers, the `poweroff` command does not perform a clean shutdown of the system.

poweron

Use the `poweron` command to power on the server. You must have R level user permission to use this command. This command has no effect if the server's keyswitch is in the Standby position, or the server is already powered on.

setlocator

Use the `setlocator` command to turn the system locator LED on or off. This command applies to Sun Fire V480 servers only. For more information on this command, refer to “Controlling the Locator LED” on page 93.

For more information on the locator LED, refer to the *Sun Fire V480 Administrator's Guide*.

showlocator

Use the `showlocator` command to view the state of the system locator LED (on or off). This command applies to Sun Fire V480 servers only. For more information on this command, refer to “Controlling the Locator LED” on page 93.

For more information on the locator LED, refer to the *Sun Fire V480 Administrator's Guide*.

RSC View Log Commands

Use the following RSC commands to work with RSC and console log files:

- `loghistory` (or `lhist`)
- `consolehistory` (or `chist`)
- `consolerestart`

`loghistory [index [+|-]n] [pause n]`

Use the `loghistory` command without subcommands to display the history of all events logged in the RSC event buffer. These events include server reset events and all RSC commands that change the state of the system. You can also use the command abbreviation `lhist`.

Use the following subcommands to control `loghistory` display.

`index [+|-]n`

Use the `index` subcommand to designate a buffer position at which to begin the display, as follows:

- `index +n` to designate a line number relative to the beginning of the buffer
- `index -n` to designate a line number relative to the end of the buffer
- `index n` to designate a line number relative to the beginning of the buffer (same as `index +n`)

The origin of counting is 1; that is, `index +1` indicates the first line in the buffer, `index -1` indicates the last. For example:

```
rsc> loghistory index -30
```

This command prints the last 30 lines and any additional lines that were appended to the buffer between the time that the command began execution and the time that it terminated.

`pause n`

Use the `pause` subcommand to display *n* lines of the log at a time (similar to the `more` command). The value of *n* must be a decimal integer. The default is to display the entire RSC log without pausing.

Each event recorded in the log has the following format:

```
$TIME $HOSTNAME $EVENTID message
```

`EVENTID` is a unique identifier for the event, `TIME` is the time the event occurred (as measured by RSC time), and *message* is a user-friendly description of the event.

The following is an example event log entry:

```
FRI JAN 01 07:33:03 2001 sst4828: 00060003: "RSC System reset"
```

```
consolehistory [boot|run|oboot|orun]
[index [+|-]n] [pause n]
```

Use the `consolehistory` command to display console messages logged in RSC buffers. With no arguments, this command prints the entire contents of all non-empty console buffers. You can use the command abbreviation `chist`.

There are four console logs:

- The `boot` buffer contains POST, OpenBoot PROM, and UNIX boot messages received from the server for the most recent boot.
- The `run` buffer contains the most recent data received from the server operating system.
- The `oboot` buffer contains POST, OpenBoot PROM, and UNIX boot messages for the first power-on boot, the *original boot*.
- If the system panics and resets, the `orun` buffer contains the most recent messages printed to the console before a reboot, which are the panic messages.



Each buffer can contain up to 16 Kbytes of information. (On Sun Enterprise 250 servers, the `boot` and `oboot` buffers can contain up to 8 Kbytes of information.)

When the first power-on boot begins, RSC fills the original boot (`oboot`) buffer with data from the server's console. After that buffer fills up, it writes data to the original run (`orun`) log. When the `orun` log fills up, it overwrites old data in the `orun` log.

When RSC senses a server reset while writing the `orun` log, it switches to the `boot` log. After that fills up, it switches to the `run` log. When the `run` log fills up, it overwrites old data in the `run` log.

When RSC senses a server reset while writing the current `run` log, it switches to the current `boot` log again.

`pause n`

Use the `pause` subcommand to display *n* lines of the log at a time (similar to the `more` command). The value of *n* must be a decimal integer. The default is to display 10 lines of the log at a time.

See “`loghistory [index [+|-]n] [pause n]`” on page 35 for a description of the `index` subcommand.

Note – Time stamps recorded in console logs reflect server time. These time stamps may be offset from RSC time stamps recorded in the RSC event log. To synchronize RSC time with server time, use the `rscadm` command `rscadm date -s`, reset the server, or run the script `/usr/platform/platform-name/rsc/rsc-initscript`. You can obtain the string to use for *platform-name* using the Solaris command `uname -i`.

consolerestart

Use the `consolerestart` command to make the current boot and run logs the *original logs* (designated `oboot` and `orun`). This command copies the current boot and run buffers to the `oboot` and `orun` buffers, overwriting the previous contents. Then it clears the current boot and run buffers. You must have A level user permission to use this command.

For example, after adding a hardware component to the server, reboot the server and use the `consolerestart` command so that the new component will appear in the original console logs.

RSC Configuration Commands

Use the following RSC commands to set or show characteristics of the RSC or server configuration:

- `set`
- `show`
- `date` (also `showdate` and `setdate`)
- `password`
- `useradd`
- `userdel`
- `usershow`
- `userpassword`
- `userperm`
- `resetrsc`

`set` *variable value*

Use the `set` command to set an RSC configuration variable. You must have A level user permission to use this command. See “RSC Configuration Variables” on page 46 for descriptions of these variables.

Changes to some variables do not take effect until the you reset RSC using the command-line interface (CLI) `resetrsc` command, or the `rscadm` subcommand `rscadm resetrsc`, or by using the graphical user interface.

You can use the null string ("") to set a variable to null. To set a variable to a string that includes spaces, enclose the string in double quotes. For example:

```
rsc> set page_info2 ""  
  
rsc> set page_init1 "&F &E0"
```

show [*variable*]

Use the `show` command to display the value of RSC configuration variables. You can specify one variable only; if you do not specify a variable, RSC displays all configuration variables. See “RSC Configuration Variables” on page 46 for descriptions of these variables.

date [[*mmdd*] *HHMM* | *mmddHHMM* [*cc*] *yy*] [.*SS*]

Use the `date` command without arguments to show RSC’s current date and time. If you have A level user permission, you can use the `date` command to set the current date and time. The following table describes components of the date format.

TABLE 4-3 Components of the `date` Command

Option	Description
mm	Month number
dd	Day-of-the-month number
HH	Hour number (24-hour system)
MM	Minute number
.SS	Second number
cc	First two digits of year
yy	Last two digits of year

You may omit the month, day, and year; the current values are applied as defaults.

Examples:

```
rsc> date 091521452000
Fri Sep 15 21:45:00 EDT 2000

rsc> date 09152145
Fri Sep 15 21:45:00 EDT 2000

rsc> date 2145
Fri Sep 15 21:45:00 EDT 2000
```

The first example sets the time to September 15, 9:45 p.m., 2000. The second example sets the time to September 15, 9:45 p.m. of the current year. The third example sets the time to 9:45 p.m. of the current month, day, and year.

Note – Whenever the server boots, it sets the RSC current date and time. In addition, the RSC hardware includes a battery backed-up time-of-day chip for maintaining RSC time in between server reboots. However, to keep RSC time in sync with server time, you should periodically run the script `/usr/platform/platform-name/rsc/rsc-initscript`. You can obtain the string to use for *platform-name* using the Solaris command `uname -i`. If you like, you can run this script at a specified interval using the `cron` utility. You can also use the `rscadm` command `rscadm date -s`.

showdate



Same as the `date` command without arguments. (Not available for Sun Enterprise 250 servers.)

setdate



Same as the `date` command with arguments. You need to have A level user permission to use the `setdate` command to set the RSC current date and time. (Not available for Sun Enterprise 250 servers.)

password

Use the `password` command to change the RSC password for the account to which you are logged in. This command behaves similarly to the UNIX `passwd(1)` command.

When used to change a password, RSC prompts for your current password, and if you enter it correctly, it prompts for the new password. RSC prompts again for the new password and updates it if entered identically both times. For example:

```
rsc> password
password: Changing password for username
Enter login password: *****
Enter new password: *****
Re-enter new password: *****
rsc>
```

Passwords have the following restrictions:

- They must contain at least six characters (only the first eight characters are significant).
- They must contain at least two alphabetic characters and at least one numeric or special character; alphabetic characters can be both uppercase and lowercase.
- They must differ from the user's login name and any reverse or circular shift of that login name; for comparison purposes, uppercase and lowercase letters are equivalent.
- The new password must differ from the old by at least three characters; for comparison purposes, uppercase and lowercase letters are equivalent.

`useradd` *username*



Use the `useradd` *username* command to add an RSC user account. You must have U level user permission to use this command. The maximum number of RSC user accounts is 16, except on Sun Enterprise 250 servers, where the maximum number is 4. Valid characters for *username* include:

- Alphabetic characters
- Numeric characters
- Period (.)
- Underscore (_)
- Hyphen (-)



The *username* field has a maximum length of 16 characters (eight characters for Sun Enterprise 250 servers), must contain at least one lowercase alphabetic character, and the first character must be alphabetic. If these restrictions are not met, the system issues a warning and the command fails.

`userdel` *username*

This command deletes an RSC user account. You must have U level user permission to use this command.



usershow [*username*]

This command shows RSC user accounts; a maximum of 16 user accounts are available (4 on the Sun Enterprise 250 servers). You must have U level user permission to use this command. If no argument is supplied, all accounts are shown. Information displayed includes username, permissions, and whether a password is assigned. For example:

```
rsc> usershow

Username Permissions Password?
-----
setup      cuar      Assigned
msmith     c--r      None

rsc>
```

userpassword *username*

This command sets or changes the password for the specified user account. You must have U level user permission to use this command. RSC does not prompt for an existing password. See the `password` command for details on password format and restrictions. For example:

```
rsc> userpassword msmith
New password:
Re-enter new password:
rsc>
```

userperm *username* [a][u][c][r]

This command sets or changes permission levels for a specified user account.

All RSC users can look at RSC information. The following arguments increase a user's authorization level:

- a – Administration permission; authorized to change the state of RSC configuration variables
- u – User administration permission; authorized to use commands that add and delete users, change user permissions, and change the authorization level of other users

- **c** – Console permission; authorized to connect to the server console
- **r** – Reset/power permission; authorized to reset, power on, and power off the server, and reboot RSC

You must have **U** level user permission to use this command. You can specify zero through four authorizations. The default authorization level for a new RSC account is none of the above (that is, read-only).

If you do not specify authorization levels, RSC sets the permissions for *username* to read-only. However, the default user permission for the account you create during the installation procedure is *cuar* (full authorization).

A user with read-only permission can only use the following commands:

- **help**
- **password**
- **date** (without arguments) and **showdate** (The **showdate** command is not available on Sun Enterprise 250 servers.)
- **shownetwork**
- **environment** and **showenvironment** (The **showenvironment** command is not available on Sun Enterprise 250 servers.)
- **loghistory**
- **consolehistory**
- **show**
- **version** and **showsc** (The **showsc** command is not available on Sun Enterprise 250 servers.)
- **logout**
- **showlocator** (Sun Fire V480 servers only)



resetrsc

The **resetrsc** command performs a hard reset of RSC. This terminates all current RSC sessions. You must have **A** level user permission to use this command. You can also reset RSC by using the **rscadm resetrsc** command.



Note – When you reset RSC on a Sun Enterprise 250 server without also resetting the server, RSC time defaults to 1/1/70. To synchronize RSC time with server time, reset the server, use the **rscadm** command **rscadm date -s** or run the script **/usr/platform/platform-name/rsc/rsc-initscript**. You can obtain the string to use for *platform-name* using the Solaris command **uname -i**.

Other RSC Commands

help

The help command displays a list of all RSC shell commands and a brief description of each.

version [-v]

The version command displays the firmware version running on RSC. Use the -v option to display more verbose information. For example:

```
rsc> version
RSC Version: 2.2
RSC Bootmon version: 2.2.0
RSC Firmware version: 2.2.0
rsc> version -v
RSC Version: 2.2
RSC Bootmon version: 2.2.0
RSC bootmon checksum: 4D018EBD

RSC Firmware version: 2.2.0
RSC Build Release: 20
RSC firmware checksum: 595254B1

RSC firmware built Aug 13 2001, 14:45:17

RSC System Memory Size: 8 MB

RSC NVRAM Version = 4
RSC hardware type: 3

rsc>
```

showsc



Same as the version command without the -v option. (Not available for Sun Enterprise 250 servers.)

logout

The `logout` command ends your RSC session and closes your RSC connection.

RSC Configuration Variables

RSC has non-volatile configuration variables you can use to change RSC behavior. The installer sets most configuration variables following installation. Thereafter, you can use the GUI, RSC shell, or the `rscadm set` command to set or change configuration variables.

You must have A level user permission to set configuration variables from the GUI or RSC shell; you must log in to the server as root to use the `rscadm` utility.

Use the `show` command to show configuration variables, and use the `set` command to set a variable. Changes to variables take effect immediately except as noted.

You can use the null string ("") to set a variable to null. To set a variable to a string that includes spaces, enclose the string in double quotes. Note that it is not necessary to enter the null string or use quotes in GUI entry fields.

Point-to-Point Protocol (PPP) Variables

`ppp_local_ip_addr`

Use this variable to specify the Internet Protocol (IP) address for RSC to use during a PPP session; use standard dot notation. If this variable is empty, RSC expects the remote node to set the Internet address dynamically. The default setting is 0.0.0.0 (empty). Changes to this variable take effect on the next PPP connection over the RSC modem.

`ppp_remote_ip_addr`

Use this variable to specify the IP address for the remote node during a PPP session; use standard dot notation. If this variable is empty, RSC expects that the remote node already has an Internet address assigned for the PPP session. The default setting is 0.0.0.0 (empty). Changes to this variable take effect on the next PPP connection over the RSC modem.

ppp_enabled

Use this variable to specify whether PPP is the default protocol on the RSC modem. Valid values are `true` or `false`; the default is `false`. Changes to this variable take effect on the next login connection over the RSC modem.

Modem Variables



Note – Modem variables are not available for Sun Enterprise 250 servers. Instead, you connect an external modem to the RSC serial port and use serial port variables to configure the connection. Refer to “Serial Connections” on page 90 for more information.

modem_parity

This variable sets the RSC modem parity for incoming connections. Valid values are `none`, `odd`, or `even`. The default setting is `none`. Changes to this variable take effect on the next login connection over the RSC modem.

modem_stop

This variable sets the number of RSC stop bits for incoming connections. Valid values are 1 or 2. The default setting is 1. Changes to this variable take effect on the next login connection over the RSC modem.

modem_data

This variable sets the number of RSC modem data bits for incoming connections. Valid values are 7 and 8. The default setting is 8. Changes to this variable take effect on the next login connection over the RSC modem.

country_code

This variable sets the modem country code. The default setting is 001 (USA). Changes to this variable take effect on the next login connection over the RSC modem.

Valid values are listed alphabetically by country in the following table:

719 Abu Dhabi	093 Afghanistan	737 Ajman
355 Albania	213 Algeria	376 Andorra
244 Angola	815 Anguilla	722 Antarctica
801 Antigua/Barbuda	054 Argentina	374 Armenia
297 Aruba	247 Ascension	061 Australia
043 Austria	994 Azerbaijan	707 Azores
802 Bahamas	973 Bahrain	708 Balearic Isle
723 Bali	880 Bangladesh	803 Barbados
375 Belarus	032 Belgium	501 Belize
229 Benin	441 Bermuda	975 Bhutan
591 Bolivia	724 Borneo	387 Bosnia
267 Botswana	55 Brazil	673 Brunei
359 Bulgaria	226 Burkina Faso	725 Burma
257 Burundi	855 Cambodia	237 Cameroon
002 Canada	720 Canary Isles	238 Cape Verde
805 Cayman Isles	236 Central African Republic	235 Chad
709 Channel Isles	726 Chatham	056 Chile
086 China	672 Christmas Island	
669 Cocos Island	057 Colombia	718 Comoros Isles
242 Congo	682 Cook Isle	506 Costa Rica
385 Croatia	053 Cuba	700 Curacao
357 Cyprus	042 Czech Republic	045 Denmark
727 Diego Garcia	253 Djibouti	806 Dominica
816 Dominican Republic	704 Easter Isles	593 Ecuador
020 Egypt	503 El Salvador	
240 Equatorial Guinea	291 Eritrea	372 Estonia
251 Ethiopia	555 Europe	554 Europe A
500 Falkland Islands	298 Faroe Islands	679 Fiji
358 Finland	033 France	594 French Guiana
693 French Polynesia	241 Gabon	220 Gambia

007 Georgia	049 Germany	233 Ghana
350 Gibraltar	030 Greece	299 Greenland
807 Grenada	705 Grenadines	590 Guadeloupe
671 Guam	502 Guatemala	224 Guinea
245 Guinea-Bissau	592 Guyana	509 Haiti
388 Herzegovina	504 Honduras	728 Hong Kong
036 Hungary	354 Iceland	091 India
062 Indonesia	098 Iran	964 Iraq
353 Ireland	711 Isle of Man	972 Israel
039 Italy	225 Ivory Coast	808 Jamaica
081 Japan	962 Jordan	729 Kampuchea
008 Kazakhstan	254 Kenya	686 Kiribati
956 Kuwait	996 Kyrgyzstan	856 Laos
371 Latvia	961 Lebanon	738 Leeward Isles
266 Lesotho	231 Liberia	218 Libya
013 Liechtenstein	370 Lithuania	352 Luxembourg
853 Macau	389 Macedonia	261 Madagascar
721 Madeira	265 Malawi	060 Malaysia
960 Maldives	223 Mali	356 Malta
230 Mauritius	692 Marshall Isle	596 Martinique
222 Mauritania	269 Mayotte	052 Mexico
691 Micronesia	701 Midway Isles	959 Moldova
976 Mongolia	377 Monaco	716 Montenegro
817 Montserrat	820 Morocco	258 Mozambique
095 Myanmar/Burma	264 Namibia	730 Nauru
977 Nepal	689 Netherland Antilles	031 Netherlands
702 Nevis	687 New Caledonia	731 New Hebrides
064 New Zealand	505 Nicaragua	227 Niger
234 Nigeria	683 Niue	670 Norfolk Isles
850 North Korea	349 Northern Ireland	047 Norway
732 Okinawa	968 Oman	092 Pakistan
680 Palau	507 Panama	675 Papua Guinea

595 Paraguay	051 Peru	063 Philippines
004 Pitcairn	048 Poland	351 Portugal
819 Puerto Rico	974 Qatar	262 Reunion
040 Romania	009 Russia	250 Rwanda
290 Saint Helena	809 Saint Kitts/Nevis	810 Saint Lucia
706 Saint Martin	508 Saint Pierre/Miquelon	811 Saint Vincent
733 Saipan	684 Samoa	378 San Marino
239 Sao Tome	966 Saudi Arabia	221 Senegal
717 Serbia	248 Seychelles	232 Sierra Leone
065 Singapore	014 Slovak Republic	015 Slovakia
386 Slovenia	677 Solomon Isles	252 Somalia
027 South Africa	082 South Korea	034 Spain
094 Sri Lanka	249 Sudan	597 Suriname
268 Swaziland	046 Sweden	041 Switzerland
963 Syria	734 Tahiti	886 Taiwan
010 Tajikistan	255 Tanzania	066 Thailand
735 Tibet	228 Togo	676 Tonga
812 Trinidad/Tobago	216 Tunisia	090 Turkey
011 Turkmenistan	813 Turks/Caicos	688 Tuvalu
256 Uganda	380 Ukraine	971 United Arab Emirates
044 United Kingdom	001 United States of America	598 Uruguay
012 Uzbekistan	678 Vanuatu	713 Vatican City
058 Venezuela	814 Virgin Isle	084 Vietnam
736 Wake Islands	681 Wallis/Futuna	967 Yemen
381 Yugoslavia	243 Zaire	260 Zambia
263 Zimbabwe		

Alert Variables

page_enabled

Use this variable to specify whether paging is enabled for RSC alerts. Valid values are `true` or `false`. The default is `false`.

mail_enabled

Use this variable to specify whether an email message is enabled for RSC alerts. Valid values are `true` or `false`. The default is `false`.

page_info1

This variable contains the phone number and associated pager ID number for sending a Telocator Alphanumeric Protocol (TAP) alert to a pager. Use the character `@` to separate the telephone number and PIN ID number (if used or needed). Valid characters are:

- digits (0-9)
- * (asterisk)
- # (pound sign)
- , (comma, for pause dialing)
- @ (for appending PIN)

If both the `page_info1` and `page_info2` variables are empty, or if the `page_enabled` variable is set to `false`, no paging will occur. The default setting for `page_info1` is empty. For example:

```
rsc> set page_info1 9,,18004420500@1234332
```

page_init1

This variable specifies a string consisting of attention (AT) commands used for configuring the RSC modem prior to sending an alert to pager 1.

page_password1

This variable contains the pager service password used to send an alert to pager 1. The password must be an alphanumeric string of six characters or fewer.

page_baud1

This variable specifies the modem baud rate to use when sending an alert to pager 1. Valid values are 300, 1200, 2400, 4800, and 9600. After RSC sends the page alert, the baud setting reverts to 9600 baud.



Note – For Sun Enterprise 250 servers, the baud setting reverts to the setting specified for the `serial_baud` variable.

page_data1

This variable specifies the number of RSC modem data bits for sending an alert to pager 1. Valid values are 7 and 8. After RSC sends the page alert, the data bits revert to the setting specified in the `modem_data` variable.



Note – For Sun Enterprise 250 servers, the data bits revert to the setting specified for the `serial_data` variable.

page_parity1

This variable specifies the RSC modem parity for sending an alert to pager 1. Valid values are none, odd, and even. After RSC sends the page alert, the parity reverts to the setting specified in the `modem_parity` variable.



Note – For Sun Enterprise 250 servers, the parity reverts to the setting specified for the `serial_parity` variable.

page_stop1

This variable specifies the number of RSC modem stop bits for sending an alert to pager 1. Valid values are 1 and 2. After RSC sends the page alert, the stop bits revert to the setting specified in the `modem_stop` variable.

Note – For Sun Enterprise 250 servers, the stop bits revert to the setting specified for the `serial_stop` variable.

page_info2

This variable contains the phone number and associated pager ID number for sending a Telocator Alphanumeric Protocol (TAP) alert to another pager. Use the character @ to separate the telephone number and ID. Valid characters are:

- digits (0-9)
- * (asterisk)
- # (pound sign)
- , (comma, for pause dialing)
- @ (for appending PIN)

If both the `page_info1` and `page_info2` variables are empty, or if the `page_enabled` variable is set to `false`, no paging will occur. The default setting for `page_info2` is empty. For example:

```
rsc> set page_info2 18004420596@4433444
```

page_init2

This variable specifies a string consisting of attention (AT) commands used for configuring the RSC modem prior to sending an alert to pager 2.

page_password2

This variable contains the pager service password used to send an alert to pager 2. The password must be an alphanumeric string of six characters or fewer.

page_baud2

This variable specifies the modem baud rate to use when sending an alert to pager 2. Valid values are 300, 1200, 2400, 4800, and 9600. After RSC sends the page alert, the baud setting reverts to 9600 baud.



Note – For Sun Enterprise 250 servers, the baud setting reverts to the setting specified for the `serial_baud` variable.

page_data2

This variable specifies the number of RSC modem data bits for sending an alert to pager 2. Valid values are 7 and 8. After RSC sends the page alert, the data bits revert to the setting specified in the `modem_data` variable.



Note – For Sun Enterprise 250 servers, the data bits revert to the setting specified for the `serial_data` variable.

page_parity2

This variable specifies the RSC modem parity for sending an alert to pager 2. Valid values are none, odd, and even. After RSC sends the page alert, the parity reverts to the setting specified in the `modem_parity` variable.



Note – For Sun Enterprise 250 servers, the parity reverts to the setting specified for the `serial_parity` variable.

page_stop2

This variable specifies the number of RSC modem stop bits for sending an alert to pager 2. Valid values are 1 and 2. After RSC sends the page alert, the stop bits revert to the setting specified in the `modem_stop` variable.



Note – For Sun Enterprise 250 servers, the stop bits revert to the setting specified for the `serial_stop` variable.

customerinfo

This variable contains customer information used in the message generated for a pager or email alert, for instance, one of the following:

- Server service contract number (recommended)

- Server location
- Name or telephone extension of the server's system administrator
- Name of the department that owns the server



This string can be up to 40 characters (eight characters on Sun Enterprise 250 servers), including alphanumeric characters and hyphen (-). The default setting is empty.

hostname



This variable contains the name of the server connected directly to RSC. RSC includes this host name in alert messages. This string can be up to 40 characters (eight characters on Sun Enterprise 250 servers), including alphanumeric characters and hyphen (-). The default setting is empty.

mailuser

This variable contains the address used for email alerts. The string has a 40-character limit; the default setting is empty. Although only a single mail address is permitted, you can notify several people that a problem has occurred by using an email alias.

mailhost

This variable contains a colon-separated list of Internet addresses to which RSC sends Simple Mail Transfer Protocol (SMTP) mail alerts. Each address is tried until the SMTP alert is successfully transmitted. Specify addresses using standard dot notation. For example:

```
rsc> set mailhost 139.143.4.2:139.142.4.15
```

You can specify a maximum of two addresses, separated by a colon. If this variable is empty, or if the `mail_enabled` variable is set to `false`, no email is sent. The default setting is empty.

page_verbose

This variable sets the maximum length for alert messages sent to pagers. The default setting, `false`, limits pager alert messages to 78 characters. The setting `true` allows the use of long alert messages, which may contain 300 characters or more. Note that some pagers or paging services may not allow long messages, and that in such cases some alert message may not be sent to pagers.



Note – The `page_verbose` variable is not available for Sun Enterprise 250 servers. Alert messages sent to pagers have unrestricted length.

Ethernet Port Variables

ip_mode

Use this variable to control how RSC configures the IP address for its local Ethernet port. Choose the `ip_mode` value according to the services available on the network to which RSC is connected. The following list describes the available values.

- `none` – Ethernet port is disabled and is not accessible.
- `dhcp` – Use the Dynamic Host Configuration Protocol (DHCP) to obtain the IP address.
- `config` – Use the `ip_addr` configuration variable to obtain the IP address.

The default setting is `dhcp`. Changes to this variable take effect after the next RSC reset.

ip_addr

This variable is only used if the `ip_mode` variable is set to `config`. Specify the IP address in standard Internet dot notation. The default setting is `0.0.0.0` (empty). Changes to this variable take effect after the next RSC reset.

ip_netmask

This variable is only used if the `ip_mode` variable is set to `config`. Specify the subnet mask in standard Internet dot notation. The default setting is `0.0.0.0` (empty). Changes to this variable take effect after the next RSC reset.

`ip_gateway`

This variable is only used if the `ip_mode` variable is set to `config`. This is the default gateway to which RSC will send IP packets when the destination is not on the same subnet as RSC. Specify the IP address in standard Internet dot notation. The default setting is `0.0.0.0` (empty). Changes to this variable take effect after the next RSC reset.

`tpe_link_test`

This variable enables 10BASE-T Ethernet link integrity tests when set to `true`, the default. If you are using RSC in a hub that does not support Ethernet link integrity tests or that has them disabled, set this variable to `false`. Changes to this variable take effect after the next RSC reset. The `tpe_link_test` variable behaves similarly to the OpenBoot PROM environment variable named `"tpe-link-test?"`, which is available on some SPARC platforms.

RSC and the local hub should have Ethernet link integrity tests enabled or disabled consistently. If this setting is not consistent, communication may not be possible.

Console Session Variable

`escape_char`

This variable sets the escape sequence character for ending a console session or modem setup and returning to the RSC shell. The escape sequence applies to all RSC users for the server. The escape sequence consists of the escape character followed by a period. The default escape character is `~` (tilde).

The escape sequence character can be a single alphanumeric character. It can also be a control character. To enter a control character as the escape character, type `“^”` (Shift-6) to represent the Control key, followed by another character. If the second character is a question mark (`?`), the Delete key is selected; otherwise the second character is converted to a control character and used as the escape character. For example, if you enter `^y` to set the escape character, users will use Control-y period to end a console session.

RSC Shell Error Messages

This section provides additional information about error messages received at the `rsc>` prompt.

Usage Errors

This section lists usage error messages that are displayed due to improper command syntax. Refer to the description of the command in this chapter for the correct syntax.

Invalid command. Type 'help' for list of commands.

Usage: `bootmode [-u] [normal|forth|reset_nvram|diag|skip_diag]`

Usage: `break`

Usage: `consolehistory [boot|run|oboot|orun] [index [+|-]<n>]
[pause <n>]`

Usage: `consolerestart`

Usage: `setlocator [on | off]`

Usage: `date [[mdd]HHMM | mddHHMM[cc]yy][.SS]`

Usage: `environment`

Usage: `loghistory [index [+|-]<n>] [pause <n>]`

Usage: `password`

Usage: `poweroff`

Usage: `poweron`

Usage: `reset`

Usage: `resetrsc`

Usage: `set <variable> <value>`

```
Usage: setdate [[mmdd]HHMM | mmddHHMM[cc]yy][.SS]

Usage: show [variable]

Usage: showdate

Usage: showenvironment

Usage: shownetwork

Usage: showsc

Usage: useradd <username>

Usage: userdel <username>

Usage: userpassword <username>

Usage: userperm <username> [c][u][a][r]

Usage: version [-v]

Usage: xir
```

General Errors

RSC reports the following general errors.

Could not get username for user <username>

During execution of the userpassword command, a SEEPROM error occurred.

Error adding user <username>

An error occurred during execution of the useradd command. This message is followed by a more detailed message.

Error changing password for <username>

An error occurred during execution of the userpassword command. This message is followed by a more detailed message.

Error changing password for <username>

During execution of the userpassword command, a SEEPROM error occurred.

Error changing password for <username> - password must be at least three characters different from old password - password must not be based on username

You entered an invalid password.

Error deleting user <username>

An error occurred during execution of the userdel command. This message is followed by a more detailed message.

Error displaying user <username>

An error occurred during execution of the usershow command. This message is followed by a more detailed message.

Error setting permission for <username>

An error occurred during execution of the userperm command. This message is followed by a more detailed message.

ERROR: username did not start with letter or did not contain lowercase letter

You entered an invalid username.

Failed to allocate buffer for console mode

During execution of the console command, RSC could not allocate enough memory to connect to the console.

Failed to allocate memory!

During execution of the show command, RSC could not allocate enough memory to show the variable's value.

Failed to get password for <username>

During execution of the userpassword command, a SEEPROM error occurred.

Failed to set <variable> to <value>

During execution of the set command, RSC encountered a SEEPROM error.

Invalid login

Login attempt failed. This message appears at the login prompt.

Invalid password

You entered an illegal password with the userpassword command.

Invalid permission: <permission>

You entered an invalid user permission. Valid permissions are [c] [u] [a] [r]. See “userperm username [a][u][c][r]” on page 43.

Malformed username

You specified a nonexistent user when entering the userpassword, userperm, or userdel command.

No free user slots

This error occurs if you try to add a user account when RSC already has four accounts configured. RSC supports only four user accounts. You must delete an account before you can add another.

Passwords don't match

The two entries for a new password did not match.

Permission denied

You attempted to execute a shell command for which you do not have the proper user permission level.

Sorry, wrong password

You entered an incorrect current password.

Unable to get value of variable <variable>

During execution of the show command, you used an invalid variable name.

User already registered

The user you are trying to add already has an RSC account on this server.

User does not exist

The username you specified is not associated with an RSC account on this server.

Using the rscadm Utility

The `rscadm` utility and its subcommands allow administration of Sun Remote System Control (RSC) from the host. You must log in to the server as root to use `rscadm`.

Installation places the `rscadm` utility in the following directory:

```
/usr/platform/platform-name/rsc/
```

You can obtain the string to use for *platform-name* using the Solaris command `uname -i`. For example:

```
% uname -i
SUNW,Sun-Fire-280R
```

Set your path to the `rscadm` utility so that you can use the command `rscadm`.

Most `rscadm` subcommands are also available using the RSC command shell, but `rscadm` is convenient for:

- Reconfiguring RSC when account passwords are unknown
- Resetting RSC when it fails to respond
- Backing up configuration data
- Downloading RSC firmware
- Synchronizing RSC date and time to the server's date and time

Note – You cannot use the `rscadm` utility, and you should not use RSC software, while SunVTS diagnostics are running.

The `rscadm` utility uses the following subcommands.

TABLE 5-1 `rscadm` Subcommands

Subcommand	Description
<code>help</code>	Displays a list of <code>rscadm</code> commands and brief descriptions for each
<code>date</code>	Displays or sets the current time and date
<code>set</code>	Sets a configuration variable
<code>show</code>	Displays one or more configuration variables
<code>shownetwork</code>	Shows current RSC card network configuration
<code>loghistory</code>	Returns the most recent log entries
<code>resetrsc</code>	Resets RSC immediately
<code>download</code>	Downloads firmware to the RSC flash PROM
<code>send_event</code>	Logs an event; can also send an alert message
<code>modem_setup</code>	Changes configuration of the RSC modem
<code>useradd</code>	Adds an RSC user account
<code>userdel</code>	Deletes an RSC user account
<code>usershow</code>	Shows characteristics of an RSC user account
<code>userpassword</code>	Sets or changes a user's password
<code>userperm</code>	Sets the authorization for a user
<code>version</code>	Reports the RSC version on the host
<code>status</code>	Same as the <code>version -v</code> command.



Note – On Sun Enterprise 250 servers, the `rscadm` subcommands `shownetwork`, `loghistory`, and `version` are not available.

rscadm Subcommands

help

This subcommand prints out a basic Help message including a list of `rscadm` subcommands and a short description of each.

date [-s]

`date [[mmdd]HHMM|mmddHHMM[cc]yy][.SS]`

Use the `date` subcommand to show the current date and time. Use the `-s` option to synchronize RSC time to the server time. Supply a date with the subcommand to set RSC time to a time other than the server time.

See “`date [[mmdd]HHMM|mmddHHMM[cc]yy][.SS]`” on page 40 for a description of date formats.

set *variable-value*

Use the `set` subcommand to set an RSC configuration variable. See “RSC Configuration Variables” on page 46 for descriptions of these variables.

You can use the null string (“”) to set a variable to null. To set a variable to a string that includes spaces or UNIX shell special characters, enclose the string in double quotes. For example:

```
# rscadm set page_info2 ""  
  
# rscadm set page_init1 "&F &E0"
```

show [*variable*]

Use the `show` subcommand to display the value of one or more RSC configuration variables. If you do not specify a variable, RSC displays all configuration variables. See “RSC Configuration Variables” on page 46 for descriptions of these variables.

shownetwork

The `shownetwork` subcommand displays the current network configuration. For example:

```
# shownetwork
RSC network configuration is:
IP Address: 129.149.2.6
Gateway Address: 129.149.2.7, 129.149.2.8
Netmask: 255.255.255.0
#
```



Note – The `rscadm` subcommand `shownetwork` is not available on Sun Enterprise 250 servers.

loghistory

Use the `loghistory` subcommand to display the history of all events logged in the RSC event buffer. These events include server reset events and all RSC commands that change the state of the system. This will return the log entries in reverse order, with the newest messages first.



Note – The `rscadm` subcommand `loghistory` is not available on Sun Enterprise 250 servers.

resetrsc [-s]

This subcommand resets RSC immediately. To terminate all connections cleanly before the reset, use the `-s` option. If no argument is supplied, this subcommand performs a hard reset and drops all connections.



Note – When you reset RSC on a Sun Enterprise 250 server without also resetting the server, RSC time defaults to 1/1/70. To synchronize RSC time with server time, reset the server, use the `rscadm` command `rscadm date -s`, or run the script `/usr/platform/platform-name/rsc/rsc-initscript`. You can obtain the string to use for *platform-name* using the Solaris command `uname -i`.

download [boot] *file*

This subcommand supports downloading new firmware residing in *file* into RSC. If you specify *boot*, the contents of *file* will be installed in the boot section of RSC non-volatile memory. If you do not specify *boot*, the contents of *file* will be installed in the main firmware section of RSC non-volatile memory.

When the transfer completes, RSC resets itself. If the host keyswitch is in the Lock position, you cannot update RSC firmware, and an error message displays.

send_event [-c] *message*

Use this subcommand to enter an event into the RSC event log. Use the *-c* option to also send an alert message that RSC forwards according to the alert configuration. The *message* is an ASCII string of no more than 80 characters. To use a string that includes spaces or UNIX shell special characters, enclose the string in double quotes.

See Appendix C for an example of a Perl script that uses this subcommand to send an alert.

modem_setup



Use this subcommand to change configuration of the RSC modem (or for Sun Enterprise 250 servers, the configuration of the modem connected to the RSC serial port). You can enter standard attention (AT) commands and see responses from the modem. At the beginning of a line, enter the escape character followed by a period to exit from this subcommand. By default, the escape character is tilde (~). For example:

```
# rscadm modem_setup

AT <enter>

OK

~.

#
```

The escape character for `modem_setup` is the same as the escape character used for the RSC shell `console` command, which is set using the `escape_char` configuration variable. See “`escape_char`” on page 57.



Note – For Sun Enterprise 250 servers, the escape sequence for `rscadm modem_setup` is always `~.` (a tilde followed by a period). The RSC console has a configurable exit character, but the escape character for `rscadm modem_setup` is fixed.

version



Reports the RSC version on the host (not available on Sun Enterprise 250 servers). An example of output returned by this command is:

```
# rscadm version
RSC version v2.0.0
RSC Bootmon v2.0.0
RSC Main v2.0.0
RSC POST status = 0XFFFF
```

This command also has a `-v` switch. Using `-v` provides more information about RSC, as shown in the following example:

```
# rscadm -v version
RSC Version v2.2
RSC Bootmon Version: v2.0.0
RSC Bootmon checksum: 3688AD82

RSC Firmware Version: v2.2.0
RSC Build Release: 20

RSC firmware checksum: 00A000A0

RSC firmware built: Sep 14 2001, 14:40:38

RSC System Memory Size 8 MB

RSC NVRAM Version = 4

RSC hardware type: 3
```

status

Same as the `version -v` command; available on all supported servers.

User Account Administration Subcommands

To administer user accounts from the host using `rscadm`, log in to the host as root and use the `rscadm` utility with the following subcommands:

- `useradd` (see “`useradd username`” on page 42)
- `userdel` (see “`userdel username`” on page 42)
- `usershow` (see “`usershow [username]`” on page 43)
- `userpassword` (see “`userpassword username`” on page 43)
- `userperm` (see “`userperm username [a][u][c][r]`” on page 43)

rscadm Error Messages

This section offers further explanation of error messages received from the `rscadm` utility. The last 12 messages are usage error messages.

Passwords didn't match, try again

During execution of the `userpassword` subcommand, you enter the password twice. If passwords do not match, you are prompted to enter them again.

`rscadm: all user slots are full`



This error occurs if you try to add a user account when RSC already has the maximum number of accounts configured. RSC supports only 16 user accounts (4 on the Sun Enterprise 250 servers). You must delete an account before you can add another.

`rscadm: command line too long`

Check for an extremely long command line.

`rscadm: command unknown`

You used an invalid `rscadm` subcommand.

rscadm: could not connect to modem

During execution of the `modem_setup` subcommand, RSC could not connect to the RSC modem. Perhaps the modem is not connected or is currently being used by the paging subsystem.

rscadm: could not disconnect from modem

During execution of the `modem_setup` subcommand, RSC refused to disconnect from the modem.

rscadm: could not read date from RSC

An undefined error in RSC firmware occurred when trying to get the RSC date.

rscadm: could not send alert

During execution of the `send_event` subcommand, RSC firmware could not send an event.

rscadm: could not set date on RSC

RSC detected an internal error while trying to set the date.

rscadm: couldn't add user

RSC encountered an internal error when trying to add a user account. The RSC SEEPROM may be faulty.

rscadm: couldn't change password

RSC encountered an internal error when trying to change a user password. The RSC SEEPROM may be faulty.

rscadm: couldn't change permissions

RSC encountered an internal error when trying to change user permissions. The RSC SEEPROM may be faulty.

rscadm: couldn't create thread

During execution of the `modem_setup` subcommand, a thread create call failed.

rscadm: couldn't delete user

RSC encountered an internal error when trying to delete a user account. The RSC SEEPROM may be faulty.

rscadm: couldn't get information on user

RSC encountered an internal error when trying to access user information during a `usershow` subcommand. The RSC SEEPROM may be faulty.

rscadm: download failed, RSC reported erase error

During execution of the download subcommand, RSC reported a hardware problem when trying to program the RSC EEPROM.

rscadm: download failed, RSC reported int_wp error

During execution of the download subcommand, RSC reported a hardware problem when trying to program the RSC EEPROM.

rscadm: download failed, RSC reported range error

During execution of the download subcommand, RSC reported a hardware problem when trying to program the RSC EEPROM.

rscadm: download failed, RSC reported verify error

During execution of the download subcommand, RSC reported a hardware problem when trying to program the RSC EEPROM.

rscadm: download failed, RSC reported vpp error

During execution of the download subcommand, RSC reported a hardware problem when trying to program the RSC EEPROM.

rscadm: download failed, RSC reported wp error

During execution of the download subcommand, RSC reported a hardware problem when trying to program the RSC EEPROM.

rscadm: download rejected, keyswitch in secure mode?

You cannot execute the download subcommand when the server keyswitch is in the Lock position.

rscadm: either the RSC hardware was not detected or a lock file was found. Only one instance of rscadm can run at a given time.

As stated.

rscadm: Error downloading file

An internal error occurred during execution of the download subcommand.

rscadm: ERROR, callback init failed

An internal error occurred during execution of the download subcommand.

rscadm: ERROR, passwords didn't match

During execution of the userpassword subcommand, you enter the password twice. If passwords do not match, you are prompted to enter them again. If they do not match again, the subcommand fails.

rscadm: ERROR, unable to set up message queue

An internal error occurred during execution of the download subcommand.

rscadm: event message can't exceed 80 characters

The message for the send_event subcommand cannot exceed 80 characters.

rscadm: file could not be opened

During execution of the download subcommand, the rscadm utility could not open the file specified on the command line.

rscadm: file not a valid s-record

During execution of the download subcommand, the file to download is not a valid s-record file.

rscadm: INTERNAL ERROR in set date

This is an internal rscadm software error.

rscadm: INTERNAL ERROR, overflow in callback

An internal error occurred during execution of the download subcommand.

rscadm: invalid variable

During execution of the set subcommand, you entered an invalid variable. See "RSC Configuration Variables" on page 46 for correct values.

rscadm: invalid variable or value

During execution of the set subcommand, you entered an invalid variable or value. See "RSC Configuration Variables" on page 46 for correct values.

rscadm: malformed password

You entered an invalid password. A valid password has between six and eight characters, at least two of which are alphabetic characters, and at least one of which is a numeric or special character.

rscadm: malformed username

You entered invalid characters in a username.

rscadm: maximum username length is - 16

The username you entered exceeded 16 characters; the maximum length for a username is 16 characters (for Sun Enterprise 250 servers, maximum length is eight characters).



rscadm: RSC did not respond during boot initialization

An internal error occurred during execution of the download subcommand.

rscadm: RSC failed to respond during download

During execution of the download subcommand, RSC did not enter boot mode correctly.

rscadm: RSC firmware not responding

RSC main firmware is not responding. Perhaps RSC is booting, main firmware is corrupt, or RSC has a hardware problem.

rscadm: RSC not responding to requests

The response expected from RSC was not sent. Check that RSC is working.

rscadm: RSC returned fatal error

During execution of the download subcommand, RSC returned an undocumented error.

rscadm: RSC returned garbage

This error can occur in various situations; as stated.

rscadm: RSC returned unknown error

During execution of the download subcommand, RSC returned undocumented status (neither success nor failure).

rscadm: RSC returned wrong response

RSC returned an invalid response during a user* subcommand. This is considered an internal error in RSC or rscadm.

rscadm: RSC unable to free up memory

This message can occur in various situations. The rscadm utility was unable to free the received message from the RSC firmware.

rscadm: Unable to reset RSC hardware

During execution of the resetrsc subcommand, an attempt to hard reset RSC failed.

rscadm: unable to send data to RSC

RSC did not acknowledge data sent to it. Check that RSC is working.

rscadm: Unable to send modem data to RSC

RSC did not acknowledge data sent to it. Check that RSC is working.

rscadm: user already exists

The user you are trying to add already has an RSC account on this server.

rscadm: username did not start with letter or did not contain lowercase letter

You used an invalid username format when trying to add an RSC user account.

rscadm: username does not exist

The username you specified is not associated with an RSC account on this server.

This program MUST be run as root

As stated.

USAGE: rscadm <command> [options]

For a list of subcommands, type rscadm help.

USAGE: rscadm date [-s] | [[mmdd]HHMM | mmdHHMM[yyyy]][.SS]

Date parameters have the following ranges:

- 01 <= mm <= 12
- 01 <= dd <= 31
- 01 <= HH <= 23
- 00 <= MM <= 59
- 19 70 <= ccyy <= 2038

USAGE: rscadm download [boot] <file>

USAGE: rscadm loghistory

USAGE: rscadm resetrsc [-s]

USAGE: rscadm send_event [-c] "message"

USAGE: rscadm set <variable> <value>

USAGE: rscadm show [variable]

USAGE: rscadm shownetwork

USAGE: rscadm useradd <username>

USAGE: rscadm userdel <username>

USAGE: rscadm userpassword <username>

USAGE: `rscadm userperm <username> [cuar]`

USAGE: `rscadm usershow [username]`

Using OpenBoot PROM Features That Support RSC

This chapter contains information about OpenBoot PROM features that support Sun Remote System Control (RSC) software.

OpenBoot PROM Commands

Several OpenBoot PROM commands have been added to support RSC. You enter these commands at the ok prompt.

```
diag-console rsc|ttya
```

This command directs power-on self-test (POST) output to either RSC (1) or ttya (0). This command takes effect after the next server reset.



Note – The command `diag-console` is not available for Sun Enterprise 250 servers; use the `diag-output-to` command instead (see “`diag-output-to rsc|ttya`” on page 78).

```
.rsc
```



Displays RSC information, including the `diag-console` setting (`diag-output-to` for Sun Enterprise 250 servers) and the RSC POST status word.

rsc-hard-reset

Performs a hard reset of RSC. This is the same as using the command `rscadm resetrsc`.



Note – Available for Sun Enterprise 250 servers only.

rsc-soft-reset

Performs a soft reset of RSC. This is the same as using the command `rscadm resetrsc -s`.



Note – Available for Sun Enterprise 250 servers only.

diag-output-to rsc|ttya

Directs POST output to either RSC (1) or ttya (0). This command takes effect after the next server reset.



Note – Available for Sun Enterprise 250 servers only. For other supported workgroup servers, use the `diag-console` command. See “diag-console rsc|ttya” on page 77.

rsc-mac-update

Updates the RSC Ethernet address from the contents of the server ID PROM. Use this command after replacing the server NVRAM module.



Note – Available for Sun Enterprise 250 servers only.

OpenBoot PROM Environment Variable Properties

Two environment variable properties are available to the user for specifying the RSC console to OpenBoot PROM. Define these variables at the ok prompt. For example:

```
ok setenv input-device rsc-console
ok setenv output-device rsc-console
```

These properties take effect after the next server reset.



Note – For Sun Enterprise 250 servers, you must set `input-device` and `output-device` to `rsc` rather than to `rsc-console`.

`rsc-console`

This property is a new device alias that is valid for `ttyio`, `input-device`, and `output-device` OpenBoot PROM console variables. Screen output and keyboard input are typically still set to be the default, and `ttya` and `ttyb` continue to be other valid options.



Note – Not available for Sun Enterprise 250 servers. For Sun Enterprise 250 servers, you must set `input-device` and `output-device` to `rsc` rather than to `rsc-console`.

`rsc`

This property is a device alias that is valid for `ttyio`, `input-device`, and `output-device` OpenBoot PROM console variables. Screen output and keyboard input are typically still set to be the default, and `ttya` and `ttyb` continue to be other valid options.

Note – Available for Sun Enterprise 250 servers only. For other supported workgroup servers, you must set `input-device` and `output-device` to `rsc-console` rather than to `rsc`.

`rsc!`

This property is a new device alias that is valid for `ttyio`, `input-device`, and `output-device` OpenBoot PROM console variables. Screen output and keyboard input are typically still set to be the default, and `ttya` and `ttyb` continue to be other valid options. This variable does not allow OpenBoot PROM to automatically search for a working console if RSC is broken.

Troubleshooting

This chapter includes information about troubleshooting Sun Remote System Control (RSC) problems, and troubleshooting the server using RSC.

Troubleshooting RSC Problems

Can't log in to RSC

- Check the RSC device name you are connecting to (Sun recommends the name *servername-rsc*).
- Check that you are using your correct RSC username; it may not be the same as your system username.
- Check that you are using your correct RSC password.

Can't connect to RSC using telnet

RSC supports a total of four concurrent telnet sessions per server, including command-line interface sessions and a graphical user interface (GUI) connection to the server console (Open Console). In addition, RSC supports up to four active concurrent RSC GUI sessions.

When the maximum number of telnet sessions are active, further attempts to connect using the `telnet` command will receive a connection closed error. The following example shows system messages for the UNIX operating environment:

```
% telnet bert-rsc
Trying 129.148.49.120...
Connected to bert-rsc.
Escape character is '^]'.
Connection closed by foreign host.
```



Note – Sun Enterprise 250 servers support two concurrent telnet sessions and three active concurrent RSC GUI sessions.

Can't connect to RSC through the Ethernet connection

First, log in to the server as root and see if the command `rscadm status` succeeds. If it does, RSC is working and there is an Ethernet configuration problem. Use the `rscadm show` command to check that Ethernet configuration variables are set correctly.

You can also:

- Log in to RSC through the RSC serial port or modem and use the GUI or the `shownetwork` command to see the current settings.
- Log in to another machine on the network and use the `ping` command to see if RSC is operating. Use RSC's name (for instance, *servername-rsc*), not the server name, as the argument to the `ping` command.
- Run SunVTS diagnostics to check the Ethernet connection. The external Ethernet test requires that the device be connected to a functional 10-Mbit hub.
- Run SunVTS diagnostics to check the RSC card.
- Use the `rscadm` subcommand `rscadm status` to check RSC status.

Can't connect to RSC through the modem

First, log in to the server as root and see if the command `rscadm status` succeeds. If it does, then RSC is working. Use the `rscadm show` command to check that modem configuration variables are set correctly (for Sun Enterprise 250 servers, check that serial port variables are set correctly).



As an alternative, you can also log in to RSC through the serial port and use the `show` command to check that the modem configuration variables are set correctly.

If the problem is with the modem:

- Log in to the server as root and use the command `rscadm modem_setup` to issue attention (AT) commands to see if you can place a call to an internal or external phone. This exercise will help to verify that the modem is working and that there are no problems with phone lines.
- Run SunVTS diagnostics to check the modem.
- Run SunVTS diagnostics to check the RSC card.



Note – For Sun Enterprise 250 servers, it is very important that the external modem is configured to use a fixed baud rate for incoming calls.

No alerts received from RSC

- RSC does not send alerts for all RSC events. Check that the alert you are expecting is an event for which RSC sends alerts.
- Log in to the server as root and use the command `rscadm send_event -c message` to send an alert.

If email alerts are not received:

- Check email configuration variables.
- Check that the mail server and backup mail server are up and configured properly.
- Try sending an email message to the recipients without using RSC.
- Check Ethernet configuration.

If pager alerts are not received:

- Check pager configuration variables.
- Try sending a pager message by some method other than RSC.
- Check with your pager service for proper pager configuration, or problems with the paging service.
- Check that the RSC modem is operational. See “Can’t connect to RSC through the modem” on page 82.
- Alert messages may be too long for the pager or paging service used. Turn off verbose messages. See “page_verbose” on page 56.

RSC passwords are unknown

If users have forgotten RSC passwords or passwords are not working, log in to the server as root and use the command `rscadm userpassword` to assign new passwords. Inform RSC users of the new passwords.

Times in RSC event log do not match times in server console logs

RSC time is synchronized to the server's time each time the server reboots. To synchronize RSC time with server time at any time, reset the server, run the script `/usr/platform/sun4u/sbin/rsc-initscript`, or use the `rscadm` command `rscadm date -s`.

You can perform some RSC functions, but not others

Specific user permissions are required to perform functions. Check your permission level. In addition, the following problems may exist:

- Cannot see console logs or access the server console using RSC.

Do one of the following:

- Use the OpenBoot PROM `diag-console` command to direct the console to RSC. (For Sun Enterprise 250 servers, use the `diag-output-to` command.)
- Use the RSC command `bootmode -u`.
- Choose Set Boot Mode using the graphical user interface and check the box labeled "Force the host to direct the console to RSC."
- Cannot put the server in debug mode or use the RSC `break` command.
The server keyswitch is in the Lock position.
- The `poweroff` command has no effect.
The server is already powered off.
- The `poweron` command has no effect.
The server is already powered on, or the keyswitch is in the Standby position.



Troubleshooting Server Problems Using RSC

RSC is useful for troubleshooting a server that is not responding. If the server is responsive, connect to it as usual and use standard tools such as Sun Management Center, SunVTS, and OpenBoot Diagnostics.

If the server is not responding, log in to your RSC account and:

- Check the RSC event log and server environmental status for problems.
- Check console logs for recent error messages.
- Try connecting to the server console to reboot the system.

Scenario: SIMM in memory bank 2 is causing continuous reboots

1. Log in to RSC and check the RSC event log.

You will see repeated server resets in the log.

2. Examine console logs.

You will see many SIMM bank 2 errors in the original run log, and eventually a panic message.

3. Connect to the server console.

You may see that the system is up now, but receiving periodic SIMM errors.

4. Log in to the server as root, and halt the system.

5. Enter the following OpenBoot PROM command to disable SIMM bank 2:

```
ok> asr-disable bank2
```

6. Reboot the server.

7. Order new memory for the server.

Platform Specific Information

This chapter discusses specific information on how RSC works on the following server platforms:

- Sun Enterprise 250 Servers
- Sun Fire V480 Servers

Sun Enterprise 250 Servers



The RSC firmware and communication ports on Sun Enterprise 250 servers differ from those on other platforms, so RSC functions slightly differently on the Sun Enterprise 250 servers. This section summarizes the differences in hardware functionality and describes the software commands and functions that are specific to the Sun Enterprise 250 servers.

Hardware and Configuration Issues

The RSC hardware for Sun Enterprise 250 servers differs from the hardware on other platforms, and the configuration script differs somewhat. TABLE 8-1 describes those differences.

TABLE 8-1 Sun Enterprise 250 Hardware Differences

Issue	Description
Backup battery / Modem	RSC hardware for Sun Enterprise 250 servers does not include a backup battery or internal PCMCIA modem. You can connect an external modem to the RSC serial port. For more information on configuring the external modem, refer to Appendix B.
RSC ports	Sun Enterprise 250 servers have an RSC Ethernet port and an RSC serial port. If you are configuring RSC on a Sun Enterprise 250 server, the configuration script asks if you want to enable the RSC serial port. If you respond <i>yes</i> , it prompts for a value for serial port baud rate, serial data bits, serial parity, serial stop bits, whether to use hardware handshaking, and whether to enable PPP over the RSC serial port.

TABLE 8-2 describes the differences in functionality.

TABLE 8-2 Sun Enterprise 250 Functionality Differences

Issue	Description
Telnet and GUI sessions	Sun Enterprise 250 servers support two concurrent telnet sessions and three active concurrent RSC GUI sessions.
Hostname and customer information strings	Limited to eight characters.
Alerts	Verbose alerts are enabled. You cannot limit the length of pager alert messages.
Number of user accounts	Sun Enterprise 250 servers support four user accounts.

Software Issues

RSC software on Sun Enterprise 250 servers uses some commands that differ from the commands used on other servers. This section describes some procedures where RSC requires different commands. It also describes some shell commands unique to RSC on Sun Enterprise 250 servers.

This section includes the following topics:

- Redirecting the console to RSC
- Software commands and shell command aliases
- Serial connections
- OpenBoot PROM environment variable properties

Redirecting the Console to RSC

After RSC software is installed and configured, the system console is still available as on any normal Sun machine. To enable RSC as the system console device instead, you must access the server console, shut down the system, and type the following commands at the ok prompt:

```
ok diag-output-to-rsc

ok setenv input-device rsc

ok setenv output-device rsc
```

After the next server reset, use the following commands to remove RSC as the default console:

```
ok diag-output-to ttya

ok setenv input-device keyboard

ok setenv output-device screen
```

Software Commands and Shell Command Aliases

The following list describes how RSC software functions on Sun Enterprise 250 servers:

- For Sun Enterprise 250 servers, the following shell command aliases are not available: `showenvironment`, `showdate`, `setdate`, and `showsc`.
- The `poweroff` command does not perform a graceful shutdown of the system.
- When using the `useradd username` command to add an RSC user account, the `username` field has a maximum length of eight characters. The Sun Enterprise 250 supports up to 4 users.

- The following `rscadm` subcommands are not available on Sun Enterprise 250 servers: `shownetwork`, `loghistory`, and `version`. For more information about the `rscadm` subcommands, refer to “`rscadm` Subcommands” on page 65.

For more information about the equivalent commands on other Sun servers, refer to Chapter 4.

Resetting RSC Using `rscadm`

The `rscadm` subcommand `resetrsc` resets the RSC software immediately. On the Sun Enterprise 250, you must reset the server whenever you use the `resetrsc` subcommand.

When you reset RSC on a Sun Enterprise 250 server without also resetting the server, RSC time defaults to 1/1/70. To synchronize RSC time with server time, reset the server, use the `rscadm` command `rscadm date -s` or run the script `/usr/platform/platform-name/rsc/rsc-initscript`. You can obtain the string to use for *platform-name* by using the Solaris command `uname -i`.

Serial Connections

The modem variables used with other Sun servers are not available for Sun Enterprise 250 servers. Instead, you connect an external modem to the RSC serial port and use the serial port variables described in this section. For more information about configuring the external modem, refer to Appendix B.

To log in to your RSC account using a modem on a Sun Enterprise 250 server, you must disable PPP by using the RSC shell, RSC GUI, or the `rscadm` utility to set the `ppp_enabled` configuration variable to false.

For Sun Enterprise 250 servers, you can set RSC to disconnect a session connected to the serial port after 10 minutes of inactivity. See information for the configuration variable “`serial_hw_handshake`” on page 92.

Each buffer can contain up to 16 Kbytes of information. On Sun Enterprise 250 servers, the `boot` and `oboot` buffers can contain up to 8 Kbytes of information.

Serial Port Variables

Serial port variables are available only for Sun Enterprise 250 servers. RSC uses modem variables with other Sun servers. Refer to Chapter 4 for more information.

RSC on the Sun Enterprise 250 servers uses the following serial port variables:

- `serial_baud`

- `serial_parity`
- `serial_stop`
- `serial_data`
- `serial_hw_handshake`

The following sections describe these variables.

`serial_baud`

This variable sets the RSC serial port baud rate. Valid values are as follows:

- 9600
- 19200
- 38400
- 57600
- 115200

The default setting is 9600. Changes to this variable take effect on the next login connection over the RSC serial port.

Note – If you set up pager alerts using the `page_baud1` or `page_baud2` variables, the baud settings for these variables revert to the setting specified for the `serial_baud` variable. Refer to “Pager Variable Settings” on page 100 for more information.

If you change the serial baud rate after configuring the serial port modem, you must reconfigure the modem. Refer to Appendix B.

`serial_parity`

This variable sets the RSC serial port parity. Valid values are none, odd, or even. The default setting is none. Changes to this variable take effect on the next login connection over the RSC serial port.

Note – If you set up pager alerts using the `page_parity1` or `page_parity2` variables, the baud settings for these variables revert to the settings specified for the `serial_parity` variable. Refer to “Pager Variable Settings” on page 100 for more information.

If you change the serial parity setting after configuring the serial port modem, you must reconfigure the modem. Refer to “Modem Reconfiguration Required After Changing RSC Serial Port Settings” on page 109.

`serial_stop`

This variable sets the number of RSC stop bits. Valid values are 1 or 2. The default setting is 1. Changes to this variable take effect on the next login connection over the RSC serial port.

Note – If you set up pager alerts using the `page_stop1` or `page_stop2` variables, the baud settings for these variables revert to the settings specified for the `serial_stop` variable. Refer to “Pager Variable Settings” on page 100 for more information.

If you change the serial stop bits setting after configuring the serial port modem, you must reconfigure the modem. Refer to “Modem Reconfiguration Required After Changing RSC Serial Port Settings” on page 109.

`serial_data`

This variable sets the number of RSC data bits; valid values are 7 and 8. The default setting is 8. Changes to this variable take effect on the next login connection over the RSC serial port.

If you change the serial data bits setting after configuring the serial port modem, you must reconfigure the modem. See “Modem Reconfiguration Required After Changing RSC Serial Port Settings” on page 109.

`serial_hw_handshake`

This variable controls whether RSC uses hardware handshaking on the RSC serial port. Valid values are `true` and `false`. The default setting is `true`. If set to `true`, hardware flow control and modem control are enabled. If set to `false`, RSC disconnects a session connected to the serial port after 10 minutes of inactivity.

OpenBoot PROM Environment Variable Properties

For Sun Enterprise 250 servers, the OpenBoot PROM environment variables are slightly different from those for other Sun servers.

Two environment variable properties are available for specifying the RSC console to OpenBoot PROM. Define these variables at the `ok` prompt. For example:

```
ok setenv input-device rsc
ok setenv output-device rsc
```

These properties take effect after the next server reset.

For more information about OpenBoot PROM commands and environment variables, refer to Chapter 6.

Sun Fire V480 Servers

This section contains the following topics:

- Controlling the Locator LED
- Fault and Failure Terminology

Controlling the Locator LED

The Sun Fire V480 server has a front panel Locator LED. You can use the RSC software (either the command-line interface or the GUI) to turn the Locator LED on and off, or to show the state of the Locator LED. This function is useful for locating a particular server in a large installation or rack tower configuration.

The instructions in this section explain how to control and monitor the Locator LED using the command line interface. For more information on the Locator LED, refer to the *Sun Fire V480 Administrator's Guide*.

To control the locator LED, perform the following procedure and press return after each command.

1. From the `rsc` prompt, type `showlocator`.

This command shows the state of the system Locator LED on the Sun Fire V480 server.

```
rsc> showlocator
Locator LED is OFF
```

2. Type `setlocator on`.

This command turns the Locator LED on. Note that the RSC CLI (command-line interface) does not show a response when you type the `setlocator` command.

```
rsc> setlocator on
```

3. **Type** `showlocator`.

This time, the RSC CLI shows that the locator LED is on.

```
rsc> showlocator  
Locator LED is ON
```

4. **Type** `setlocator off`.

```
rsc> setlocator off
```

5. **Type** `showlocator`.

This time, the RSC CLI shows that the locator LED is off.

```
rsc> showlocator  
Locator LED is OFF
```

Fault and Failure Terminology

All Sun server platforms show two operational states that you can view and monitor using RSC: `ok` and `failed`, or `failure`. The Sun Fire V480 server has an additional operational state: `fault`. This section explains the differences between the `fault` state and the `failed` state.

A *fault* indicates that a device is operating in a degraded state, but is still fully operational. Due to this degradation, the device may not be as reliable as a device that does not show a fault, but it will still be able to perform its primary function. For example, a power supply would show a fault state if an internal fan has failed; however, it can still provide regulated power as long as its temperature does not exceed the critical threshold. In this faulted state, the power supply may not be able to function indefinitely, depending on the temperature, load, and efficiency; therefore, it is not as reliable as a non-faulted power supply.

A *failure* indicates that a device is no longer operational as required by the system. A device will fail due to some critical fault condition or combination of fault conditions. When a device enters a failed state, it ceases to function and is no longer available as a system resource. Using the example of the power supply in the previous paragraph, the power supply is considered failed if it ceases to provide regulated power.

Installing and Configuring an Uninterruptible Power Supply (UPS)

Sun Remote System Control (RSC) Version 2.2 cards include a battery that supplies power to RSC for a short period of time after a complete power failure. To extend the time you can use RSC, connect the host power cord to an uninterruptible power supply (UPS). SunExpress™ sells several suitable UPS devices.



Note – RSC hardware on Sun Enterprise 250 servers does not include a battery.

This appendix provides an example of installing and configuring an American Power Conversion SmartUPS 1000 with PowerChute *plus* 4.2.2 software, for use with RSC. The UPS uses RSC software on the server to record events and generate alerts.

How to Install the UPS

1. **Install the UPS as documented in the *SmartUPS Quick Reference Guide*.**
2. **Install and configure PowerChute *plus* monitoring software as documented in the SmartUPS document *Software Installation: Instruction Sheet*.**
3. **Connect the UPS to one of the server serial ports.**

How to Configure the UPS to Record Events and Send Alerts

PowerChute *plus* software allows you to run a command file or shell script whenever a designated “event action” occurs. See “Configuring Actions” in the *PowerChute plus User Guide*. Use the command `rscadm send_event` to log events and send alerts to RSC from the server.

1. Log in to the server and start the PowerChute *plus* application.
2. Choose Event Actions from the Configuration menu.
3. In the Event Actions dialog box, click on an event that you want to notify RSC about (for example, UPS On Battery).
4. Select the Run Command File and then click on the associated Options button.
The Run Command File dialog box opens.
5. Using a text editor, create a command file with the following content:

```
rscadm send_event -c "UPS: UPS On Battery"
```

You can use any message string in place of "UPS: UPS On Battery". Be sure to enclose the message string in double quotes.

Use the `-c` option to send an alert and also record the event in the RSC event log. To log the event only, do not use the `-c` option.

6. Save the file as `/usr/platform/platform-name/sbin/ups_batt.com`.

You can obtain the string to use for *platform-name* using the Solaris command `uname -i`. For example:

```
% uname -i
SUNW,Sun-Fire-280R
```

7. Type the name of this file into the Run Command File dialog box.
8. Enter an integer for Seconds Before Executing.
This value will normally be 0.
9. Click on OK.

10. Repeat steps 2 through 9 for each event for which you want to create a log entry or send an alert, using appropriate content and command file names.
11. Click on OK in the Event Actions dialog box to confirm changes.
12. Choose Exit from the PowerChute *plus* System menu.

Configuring the Sun Enterprise 250 Server RSC Serial Port Modem



This appendix applies to Sun Enterprise 250 servers only. When you connect a third-party modem to the Sun Enterprise 250 RSC serial port, you must configure the modem. For other platforms, the modem on the RSC card is preconfigured.

You can access RSC using an Ethernet connection, and you can also install a dedicated modem connected to the RSC serial port for access from outside your company network. For increased security, you can specify a dialback number if the modem supports this feature.

To install and configure the modem, follow the instructions that came with it. This appendix gives examples for configuring a MultiTech MultiModem II, MT2834 Series Intelligent Data/Fax Modem (Sun part number 370-2234-03), and a Courier V.Everything modem.

To enable and set up the RSC modem, you should use the following configuration settings unless otherwise indicated. You can use the GUI (graphical user interface) to change configuration settings, or you can use the RSC shell or the `rscadm` utility to change configuration variables.

General Settings

Use the following settings to configure the RSC serial port.

TABLE B-1 Serial Port General Settings

GUI Setting	Configuration Variable Setting
Serial Port Settings	
Baud Rate: 9600	<code>serial_baud 9600</code>
Parity: None	<code>serial_parity none</code>
Stop Bits: One	<code>serial_stop 1</code>
Data Bits: Eight	<code>serial_data 8</code>
Enable Hardware Handshaking	<code>serial_hw_handshake true</code>
Enable PPP	<code>ppp_enabled true</code>

Pager Variable Settings

For sending pager alerts, RSC is designed to operate with any modem paging service that complies with the Telocator Alphanumeric Protocol (TAP). If you want to support both dial-in to the RSC modem and dial-out to pagers, set the RSC serial port baud rate and pager baud rates to 9600.

Use the following settings to enable and configure pager alerts. Use of pager 2 is optional. You do not need to enter settings for pager 2 if you are using a single pager. In this table, the characters -> indicate menu hierarchy; for example, Alert Settings->Pager means open Alert Settings and then choose Pager.

TABLE B-2 Pager Alert Settings

GUI Setting	Configuration Variable Setting
Alert Settings->Pager	
Send RSC alerts to pagers	page_enabled true
Alert Settings->Pager->Pager 1	
Number: <i>phone number to dial</i> PIN: <i>pager user's PIN</i>	page_info1 <i>number@ID</i>
Alert Settings->Pager->Pager 1->Advanced	
Baud Rate: 9600	page_baud1 9600
Parity: Even	page_parity1 even
Stop Bits: One	page_stop1 1
Data Bits: Seven	page_data1 7
Password: <i>password</i>	page_password1 <i>password</i>
Modem Init. String: see "Modem Initialization Strings" on page 102	page_init1
Alert Settings->Pager->Pager 2	
Number: <i>phone number to dial</i> PIN: <i>pager user's PIN</i>	page_info2 <i>number@ID</i>
Alert Settings->Pager->Pager 2->Advanced	
Baud Rate: 9600	page_baud2 9600
Parity: Even	page_parity2 even
Stop Bits: One	page_stop2 1
Data Bits: Seven	page_data2 7
Password: <i>password</i>	page_password2 <i>password</i>
Modem Init. String: see "Modem Initialization Strings" on page 102	page_init2

Pager Phone Number

The pager phone number is the number for the paging service's TAP connection, and not the number for voice page notifications. It must be a phone number that connects to a modem that adheres to the TAP protocol. You may need to contact your paging service to obtain this number as well as other pager configuration parameters.

Pager phone numbers must include the complete string to dial; for instance, if your internal phone network requires a 9 before the number, include it. You can include a comma (,) after the 9 if a pause is required in order to wait for a dial tone. For example, 9,18005551212.

Storing Configuration Strings in the Modem's NVRAM

Use the `rscadm modem_setup` command to set modem configuration. Arguments to the `modem_setup` command consist of attention (AT) commands. Then store the settings in the modem's NVRAM.

Use the following initialization:

- Turn off RTS flow control.
- Reset modem when DTR drops.
- Set the serial port to fixed baud rate for incoming calls.

Modem Initialization Strings

Use the modem initialization strings for pagers 1 and 2 to allow RSC to set modem parameters required by the paging service during modem setup. The initialization string consists of AT commands.

The variables `page_init1` and `page_init2` have a maximum length of 15 characters, and are not stored in the modem's NVRAM. Settings in the `page_init1` and `page_init2` variables complement or override the settings you store in the modem's NVRAM memory using the `rscadm modem_setup` command. Note that if you use a different phone number or paging service for pagers 1 and 2, you may need to enter different initialization strings for each pager.

See "Setting Up the MultiTech MultiModem II" on page 103 for the MultiTech MultiModem II initialization string, and see "Setting Up the Courier V.Everything Modem" on page 106 for the Courier V.Everything modem initialization string.

Pager Password

The pager password is the password for the TAP paging service. In most cases in the United States, this password is not used. However, some paging services (for instance, in the United Kingdom) require a password.

Setting Up the MultiTech MultiModem II

Use the following information to set up the MultiTech MultiModem II.

Set Modem DIP Switches

Check that all modem DIP switches for the MultiTech MultiModem II are in the default position, as specified in the following table.

TABLE B-3 MultiTech MultiModem II DIP Switch Settings

Switch	Switch Function	Setting: Up/Down
1	Forced DTR	DTR function normally: Up
2	Flow control	Hardware flow control: Up
3	Enable/suppress responses	Enable responses: Down
4	UNIX UUCP spoofing	Disable UUCP spoofing: Up
5	Enable/disable auto-answer	Enable auto-answer: Up
6	Maximum throughput setting	Enable maximum throughput: Up
7	Request to send forced	RTS forced on: Down
8	Enable/disable command mode	Enable command mode: Down
9	Digital loopback test	Remote digital loopback test: Down
10	Leased line/dial-up operation	Dial-up operation: Up
11	AT responses/MultiTech responses	MultiTech responses: Down
12	Asynchronous/synchronous operation	Asynchronous operation: Down
13	Speed switch	28,800-bps operation: Up
14	Speed switch	28,800-bps operation: Up
15	Carrier detect/DSR forcing	CD and DSR normal: Up

Modify RSC Configuration Variables

Using the RSC GUI or RSC shell, set the following configuration variables.

TABLE B-4 MultiTech MultiModem II RSC Settings

GUI Setting	Configuration Variable Setting
Serial Port Settings	
Baud Rate: 9600	<code>serial_baud 9600</code>
Enable Hardware Handshaking	<code>serial_hw_handshake true</code>
Alert Settings->Pager->Pager 1->Advanced	
Baud Rate: 9600	<code>page_baud1 9600</code>
Modem Init. String: &D3&E0&E14\$BA1	<code>page_init1 &D3&E0&E14\$BA1</code>
Alert Settings->Pager->Pager 2->Advanced	
Baud Rate: 9600	<code>page_baud2 9600</code>
Modem Init. String: &D3&E0&E14\$BA1	<code>page_init2 &D3&E0&E14\$BA1</code>

The string &D3 sets the modem to reset when DTR drops, the string &E0 disables error correction, the string &E14 disables data compression, and the string \$BA1 turns off speed conversion.

To check that these settings are correct, use the `rscadm show` command.

Modify Modem Settings

Use the `rscadm modem_setup` command to enter the following AT commands.

```
# rscadm modem_setup

OK
ATZ (Reset modem)

OK
AT$BA1 (Turn off speed conversion)

OK
AT&W0 (Write out settings to modem)
```



```
OK
AT$SB9600 (Set serial port baud rate to 9600)

OK
AT&W0 (Write out settings to modem)

OK
AT$BA0 (Turn on speed conversion)

OK
AT&W0 (Store current settings to modem NVRAM)

OK
```

After executing these AT commands, you can verify the modem settings in NVRAM by using the ATL5 command:

```
OK
ATL5

B1 E1 M1 Q0 R0 V1 X0 &E0 &E4 &E6 &E8 &E10 &E13 &E14 %C0 #C1 *C0 &C1
$MB9600 $SB9600 $BA0 &W0

OK
```

After confirming settings, turn the modem off, reset RSC using the GUI or the `resetrsc` shell command, and then turn the modem on again.

Setting Up the Courier V.Everything Modem

Use the following information to set up the Courier V.Everything modem.

Set Modem DIP Switches

Set the DIP switches for the Courier V.Everything modem according to the following table.

TABLE B-5 Courier V.Everything DIP Switch Settings

Switch	Switch Function	Setting: Off/On
1	Normal response to DTR signal/ignore DTR signal	Normal response to DTR signal: Off
2	Verbal/numeric result code format	Verbal result code format: Off
3	Display/suppress result codes	Display result codes: On
4	Echo/do not echo offline commands	Do not echo offline commands: On
5	Auto-answer/do not auto-answer	Auto-answer: Off
6	Send carrier detect signal normally/always send CD	Send carrier detect signal normally: Off
7	Display all result codes/display only when originating	Display all result codes: Off
8	Act on AT commands (smart)/ignore AT commands (dumb)	Act on AT commands: On
9	Disconnect on receipt of +++/enter online command mode on receipt of +++	Disconnect on receipt of +++: Off
10	Load the configuration that is stored in non-volatile memory/load the &F0 configuration from read-only memory	Load the configuration that is stored in non-volatile memory: Off

Modify RSC Configuration Variables

Using the RSC GUI or RSC shell, set the following configuration variables.

TABLE B-6 Courier V.Everything RSC Settings

GUI Setting	Configuration Variable Setting
Serial Port Settings	
Baud Rate: 9600	<code>serial_baud 9600</code>
Enable Hardware Handshaking	<code>serial_hw_handshake true</code>
Alert Settings->Pager->Pager 1->Advanced	
Baud Rate: 9600	<code>page_baud1 9600</code>
Modem Init. String: E1&B1&M0&K0&N6	<code>page_init1 E1&B1&M0&K0&N6</code>
Alert Settings->Pager->Pager 2->Advanced	
Baud Rate: 9600	<code>page_baud2 9600</code>
Modem Init. String: E1&B1&M0&K0&N6	<code>page_init2 E1&B1&M0&K0&N6</code>

The string E1 turns echo on, the string &B1 sets fixed serial port baud rate, the string &M0 disables error correction, the string &K0 disables data compression, and the string &N6 sets baud rate to 9600.

To use a baud rate other than 9600, change the baud rate for pager 1 or 2, and also use the corresponding AT command in the modem initialization string:

- &N1 – 300 baud
- &N2 – 1200 baud
- &N3 – 2400 baud
- &N4 – 4800 baud
- &N6 – 9600 baud

To check that these settings are correct, use the `rscadm show` command.

Modify Modem Settings

Use the `rscadm modem_setup` command to enter the following AT commands.

```
# rscadm modem_setup

OK
ATZ (Reset modem)

OK
ATE1 (Turn echo on for this session)

OK
AT&N6 (Set serial port baud rate to 9600)

OK
AT&R1 (Turn off RTS flow control)

OK
ATS13=1 (Set S-register 13 to 1; reset modem when DTR drops)

OK
AT&B1 (Set serial port to fixed rate)

OK
AT&W (Store current settings to modem NVRAM)

OK
```

After executing these AT commands, you can verify the modem settings in NVRAM by using the AT+I5 command.

```
OK
AT+I5

USRobotics Courier V.Everything NVRAM Settings...

      BAUD=9600      PARITY=N  WORDLEN=8  DIAL=TONE

      B0   F1   M1   X1   &A1  &B1  &G0  &H0  &I0  &K0
      &L0  &M0  &N6  &P0  &R1  &S0  &T5  &U0  &X0  &Y1  %N6  #CID=0

S00=001 S02=043 S03=013 S04=010 S05=008 S06=002 S07=060 S08=002
S09=006 S10=014 S11=070 S12=050 S13=001 S15=000 S19=000 S21=010
S22=017 S23=019 S24=150 S25=005 S26=001 S27=000 S28=008 S29=020
S31=000 S32=009 S33=000 S34=000 S35=000 S36=000 S37

OK
```

After confirming settings, turn the modem off, reset RSC using the GUI or the `resetrsc` shell command, and then turn the modem on again.

Modem Reconfiguration Required After Changing RSC Serial Port Settings

If you change the RSC serial port baud rate after configuring the modem, you must reconfigure the modem to use the new baud rate. Use a similar procedure if you change the serial parity, data bits, or stop bits setting.

1. **Log in as root and use the `rscadm modem_setup` command.**

The modem adjusts automatically to the new baud rate.

2. **If desired, adjust the modem's phone line baud rate to match the serial port baud rate.**

For example, if you changed the serial port baud rate to 19200, use the following AT commands:

For the MultiTech II MultiModem: `AT&$MB19200`.

For the Courier V.Everything modem: `AT&N10`.

3. **Write the modem's current settings to the modem's NVRAM, so that the modem will default to the current settings.**

For the MultiTech II MultiModem, use this AT command at the OK prompt: `AT&W0`.

For the Courier V.Everything modem, use this AT command at the OK prompt: `AT&W`.

Troubleshooting Modem Problems

You can log in to the host as root and use the command `rscadm modem_setup` to debug modem problems. Then you can issue AT commands to the modem and attempt to dial the paging terminal of your paging service. When you connect successfully to a paging terminal that uses the TAP protocol, you should receive the `ID=` prompt, indicating the start of a successful TAP connection.

If you cannot log in successfully using AT commands, check modem hardware configuration such as DIP switches and RSC serial port settings.

Instead of using the `rscadm` command, you can connect the modem to one of the server's serial ports and use a UNIX utility such as `tip` to connect to the TAP paging terminal. This allows you to check the modem independent of RSC. If you can connect successfully using this method, you know you are using the correct paging terminal number. See the man pages for `tip` and `stty` for UNIX-level troubleshooting.

To check pager alerts, use the command `rscadm send_event -c message`. This sends an alert message to pagers specified by RSC configuration.

Creating a Script That Sends an Alert Message or RSC Event

You can embed the `rscadm` subcommand `send_event` in a script or command file to log a Remote System Control (RSC) event or send an alert when certain conditions occur. Use the `-c` option to send an alert.

This appendix provides an example Perl script file named `dmon.pl` that sends an RSC alert when a specified disk partition exceeds a specified percent of its capacity. This script is written for use with a Sun Fire™ 280R server. To use this script as intended, submit a separate entry to the `crontab` utility for each disk partition you want to monitor.

```
#!/usr/bin/perl

# Disk Monitor
# USAGE: dmon <mount> <percent>
# e.g.: dmon /usr 80

@notify_cmd = '/usr/platform/SUNW,Sun-Fire-280R/sbin/rscadm';

if (scalar(@ARGV) != 2)
{
    print STDERR "USAGE: dmon.pl <mount_point> <percentage>\n";
    print STDERR " e.g. dmon.pl /export/home 80\n\n";
    exit;
}

open(DF, "df -k|");
$title = <DF>;

$found = 0;
while ($fields = <DF>)
```

```

{
    chop($fields);
    ($fs, $size, $used, $avail, $capacity, $mount) = split(' ', $fields);
    if ($ARGV[0] eq $mount)
    {
        $found = 1;
        if ($capacity > $ARGV[1])
        {
            print STDERR "ALERT: \"", $mount, "\" is at ", $capacity,
                " of capacity, sending notification\n";
            $notify_msg = 'mount point "'. $mount. "' is at '."
                $capacity. ' of capacity';
            exec (@notify_cmd, 'send_event', '-c', $notify_msg)
                || die "ERROR: $!\n";
        }
    }
}

if ($found != 1)
{
    print STDERR "ERROR: \"", $ARGV[0],
        "\" is not a valid mount point\n\n";
}

close(DF);

```


RSC Event Codes

Certain entries in the RSC (Sun Remote System Controller) event log and in alert messages include an event code that identifies system events. The following tables identify these codes.

TABLE D-1 Power Supply Event Codes

Event Code	Event
0x00000000	PS1_FAIL
0x00000001	PS1_OK
0x00000002	PS2_FAIL
0x00000003	PS2_OK
0x00000004	PS_GENERAL_FAIL

TABLE D-2 Disk Event Codes

Event Code	Event
0x00010000	DISK0_FAILURE
0x00010001	DISK0_OK
0x00010002	DISK1_FAILURE
0x00010003	DISK1_OK
0x00010004	DISK2_FAILURE
0x00010005	DISK2_OK
0x00010006	DISK3_FAILURE
0x00010007	DISK3_OK
0x00010008	DISK4_FAILURE

TABLE D-2 Disk Event Codes *(Continued)*

Event Code	Event
0x00010009	DISK4_OK
0x0001000a	DISK5_FAILURE
0x0001000b	DISK5_OK
0x0001000c	DISK6_FAILURE
0x0001000d	DISK6_OK
0x0001000e	DISK7_FAILURE
0x0001000f	DISK7_OK

TABLE D-3 Temperature Event Codes

Event Code	Event
0x00020000	CPU0_MIN_TEMP
0x00020001	CPU0_WARNING
0x00020002	CPU0_SHUTDOWN
0x00020003	CPU0_OK
0x00020004	CPU1_MIN_TEMP
0x00020005	CPU1_WARNING
0x00020006	CPU1_SHUTDOWN
0x00020007	CPU1_OK
0x00020008	MB0_MIN_TEMP
0x00020009	MB0_WARNING
0x0002000a	MB0_SHUTDOWN
0x0002000b	MB0_OK
0x0002000c	MB1_MIN_TEMP
0x0002000d	MB1_WARNING
0x0002000e	MB1_SHUTDOWN
0x0002000f	MB1_OK
0x00020010	PDB_MIN_TEMP
0x00020011	PDB_WARNING
0x00020012	PDB_SHUTDOWN
0x00020013	PDB_OK

TABLE D-3 Temperature Event Codes *(Continued)*

Event Code	Event
0x00020014	SCSI_MIN_TEMP
0x00020015	SCSI_WARNING
0x00020016	SCSI_SHUTDOWN
0x00020017	SCSI_OK

TABLE D-4 User Event Codes

Event Code	Event
0x00030000	USER_WARNING
0x00030001	USER_CRITICAL
0x00030002	USER_TEST_PAGE
0x00030003	USER_TEST_START
0x00030004	USER_TEST_END

TABLE D-5 System Event Codes

Event Code	Event
0x00040000	POWER_OFF
0x00040001	POWER_ON
0x00040002	SYSTEM_RESET
0x00040003	SYSTEM_GEN_ERROR
0x00040004	SYSTEM_FAN_OK
0x00040005	SYSTEM_FAN_FAILURE
0x00040006	SYSTEM_SET_BOOTMODE_NORMAL
0x00040007	SYSTEM_SET_BOOTMODE_FORTH
0x00040008	SYSTEM_SET_BOOTMODE_RESET_NVRAM
0x00040009	SYSTEM_SET_BOOTMODE_DIAG
0x0004000a	SYSTEM_SET_BOOTMODE_SKIP_DIAG
0x0004000b	SYSTEM_SET_BOOTMODE_CLEAR
0x0004000c	SYSTEM_I2C_ERROR
0x0004000d	SYSTEM_POLLER_OFF

TABLE D-6 Keyswitch Event Codes

Event Code	Event
0x00050000	KEYSWITCH_LOCKED
0x00050001	KEYSWITCH_OFF
0x00050002	KEYSWITCH_ON
0x00050003	KEYSWITCH_DIAG
0x00050004	KEYSWITCH_BROKEN

TABLE D-7 RSC Event Codes

Event Code	Event
0x00060000	RSC_LOGIN
0x00060001	RSC_LOGIN_FAILURE
0x00060002	RSC_LOGOUT
0x00060003	RSC_BOOT
0x00060004	RSC_RESET_HOST_COMMAND
0x00060005	RSC_NVRAM_UPDATE
0x00060006	RSC_PAGER_FAILURE
0x00060007	RSC_EMAIL_FAILURE
0x00060008	RSC_DHCP_INIT
0x00060009	RSC_DHCP_COMPLETE
0x0006000a	RSC_DHCP_LEASELOST
0x0006000b	RSC_BREAK_COMMAND
0x0006000c	RSC_DATE_CHANGED
0x0006000d	RSC_BATTERY_LOW
0x0006000e	RSC_CARD_DETECT
0x0006000f	RSC_MODEM_LINE_ERROR
0x00060010	RSC_MODEM_ERROR
0x00060011	RSC_PAGE_SVC_ERROR
0x00060012	RSC_BATTERY_POWER (???)

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