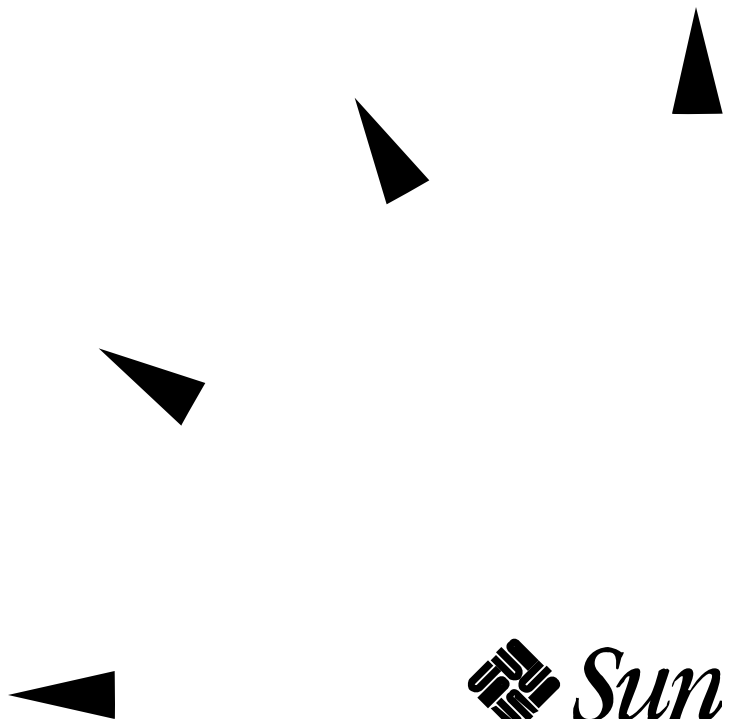


SunVTS™ 2.0 User's Guide

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Preface

SunVTS™ 2.0 is a system exerciser that extends diagnostic test coverage and features. The *SunVTS 2.0 User's Guide* describes how to use the OPEN LOOK™, CDE™, text-based terminal (TTY), and SunVTS command line interfaces, and discusses its features.

The primary audience of this manual is hardware testing and verification personnel, qualified service-trained maintenance providers, and advanced system end-users.

Use the table below to find the information you need.

How do I start SunVTS?	<i>page 14</i>
How do I use SunVTS?	<i>page 2</i>
Where is the overview of the OPEN LOOK interface?	<i>page 42</i>
Where is the overview of the CDE interface?	<i>page 36</i>
Where can I find pointers on the TTY interface?	<i>page 66</i>
What is unique about the SunVTS environment?	<i>page 3</i>
Where can I find a list of SunVTS features?	<i>page 6</i>
What do these hardware tests validate?	<i>page 1</i>

How This Book Is Organized

Chapter 1, “Overview of SunVTS 2.0,” describes the SunVTS architecture, and provides an annotated list of the features.

Chapter 2, “Using SunVTS,” provides all the information you need to start using SunVTS.

Chapter 3, “User Interfaces,” describes the SunVTS Graphical User Interfaces (GUI).

Chapter 4, “SunVTS Testing Environment,” describes a SunVTS testing environment.

Chapter 5, “Troubleshooting,” provides some problem solving techniques for SunVTS.

Related Books

The following table lists other SunVTS documents:

Table P-1 SunVTS Documents

Document Title	Part Number
<i>SunVTS 2.0 Test Reference Manual</i>	802-5330
<i>SunVTS 2.0 Quick Reference Card</i>	802-5329

Typographic Conventions

The following table describes the typographic changes used in this book.

Table P-2 Typographic Conventions

Typeface or Symbol	Meaning	Example
AaBbCc123	The names of commands, files, and directories; on-screen computer output	Edit your <code>.login</code> file. Use <code>ls -a</code> to list all files. machine_name% You have mail.
AaBbCc123	What you type, contrasted with on-screen computer output	machine_name% su Password:
<i>AaBbCc123</i>	Command-line placeholder: replace with a real name or value	To delete a file, type <code>rm filename</code> .
<i>AaBbCc123</i>	Book titles, new words or terms, or words to be emphasized	Read Chapter 4 in <i>User's Guide</i> . These are called <i>class</i> options. You <i>must</i> be root to do this.

Shell Prompts in Command Examples

The following table shows the default system prompt and superuser prompt for the C shell, Bourne shell, and Korn shell.

Table P-3 Shell Prompts

Shell	Prompt
C shell	machine_name%
C shell superuser	machine_name#
Bourne shell and Korn shell	\$
Bourne shell and Korn shell superuser	#

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Luxembourg	32-2-720-09-09	32-2-725-88-50
Germany	01-30-81-61-91	01-30-81-61-92
The Netherlands	06-022-34-45	06-022-34-46
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Overview of SunVTS 2.0



This chapter gives an overview of SunVTS 2.0 and describes its client/server architecture. This chapter also explains some of the main uses of SunVTS.

Table 1-1 is an alphabetical list of major SunVTS 2.0 features, commands, and options. Besides defining these features, this table also provides pointers to other sections in this book where you can find more information about a given topic.

SunVTS 2.0, Sun's online validation test suite, tests and validates Sun™ hardware by verifying the configuration and functionality of most hardware controllers, devices, and platforms.

Also available in SunVTS is the selectable device mapping feature. In *Physical* mapping, tests are grouped according to the physical location of the devices that are tested. In *Logical* mapping, tests are grouped according to the functionalities the tested devices perform.

Combined with the modifiable test instances and processor affinity features, SunVTS can be tailored to run on various type of machines ranging from desktops to servers at the runtime.

SunVTS is an online diagnostics tool and system exerciser that can be used to simulate the worst case scenario to pinpoint any potential problems. Use it to validate a system during development, production, receiving inspection, trouble shooting, and periodical maintenance or monitoring. Since the SunVTS tests cover a wide range of products and peripherals, proper test options need to be selected to make it most effective. Although SunVTS pre-sets the testing

options in both Connectivity and Online modes, it is quite flexible in Offline mode. Refer to the *SunVTS 2.0 Test Reference Guide* to select the proper options before running any tests. The selected options can always be saved in an Option file and recalled at later test sessions.

The SunVTS tests rely on system calls and driver interfaces for testing. As a result, fault isolation capability is limited by these tasks. Error messages point to the fault location.

Test Modes

Under SunVTS, tests can be run in three test modes:

- Connectivity mode - a low stress, quick testing of the availability/connectivity of the tested device is run.
- Online mode - a more thorough but non-intrusive test is invoked, which does not affect other applications running at the same time.
- Offline mode - this test assumes that there are no other applications running and that it can use whatever system resources are required to do thorough testing.

Some tests may not support all three modes, in which case the tests are disabled (grayed out) from being selected.

User Interfaces

The SunVTS user interface can be launched directly from the Solstice™ SyMON™ system monitoring tool to make online diagnostics more accessible. Refer to the SyMON documentation for more information.

You can also use the ETI-based TTY interface or the command line interface to operate SunVTS from the Solaris command line.

SunVTS can be used with these interfaces:

- Window Interface - the SunVTS user interface runs in both OPEN LOOK and Common Desktop Environment (CDE) environments. See Chapter 3, “User Interfaces”.

- TTY Interface - you can run SunVTS from a terminal, a shelltool, or a modem attached to a serial port using the TTY interface. See Chapter 3, “User Interfaces”.

SunVTS Architecture

The SunVTS architecture is divided into three components: the SunVTS kernel, the user interface, and the hardware tests. An overview of each component follows.

- SunVTS kernel

The main functions of the SunVTS kernel are:

- Probes and saves the test system’s hardware configuration upon start-up
- Logs messages reported from tests
- Maintains the status of all running tests
- Monitors the status requests or control commands from a user interface or other applications
- Schedules the tests that are enabled by the user
- Runs as a background process (daemon)

- User interface

A separate process from the SunVTS kernel. The SunVTS user interfaces communicate with the SunVTS kernel through an application programming interface (API). The SunVTS API lets a user interface, send, and receive commands from the SunVTS kernel. Normally, the user interface is running on a different machine than the one being tested.

- Hardware tests

Each hardware device supported by Sun can be validated by a corresponding hardware test. Each test is a separate process from the SunVTS kernel process. The hardware tests send the status and messages to the SunVTS kernel through interprocess communication (IPC) protocols. Tests are run on the machine that has the SunVTS kernel. The SunVTS kernel automatically probes the system kernel for installed hardware devices. Those devices are then displayed on the SunVTS control panel with the appropriate tests and test options. This provides a quick check of your hardware setup.

SunVTS has a shared object library that contains test-specific probing routines. At runtime, the SunVTS kernel dynamically links in and calls these probing routines to initialize its data structure with test-specific information. New tests can be added into the SunVTS environment without re-compiling the SunVTS source code.

Figure 1-1 is a diagram of the SunVTS architecture.

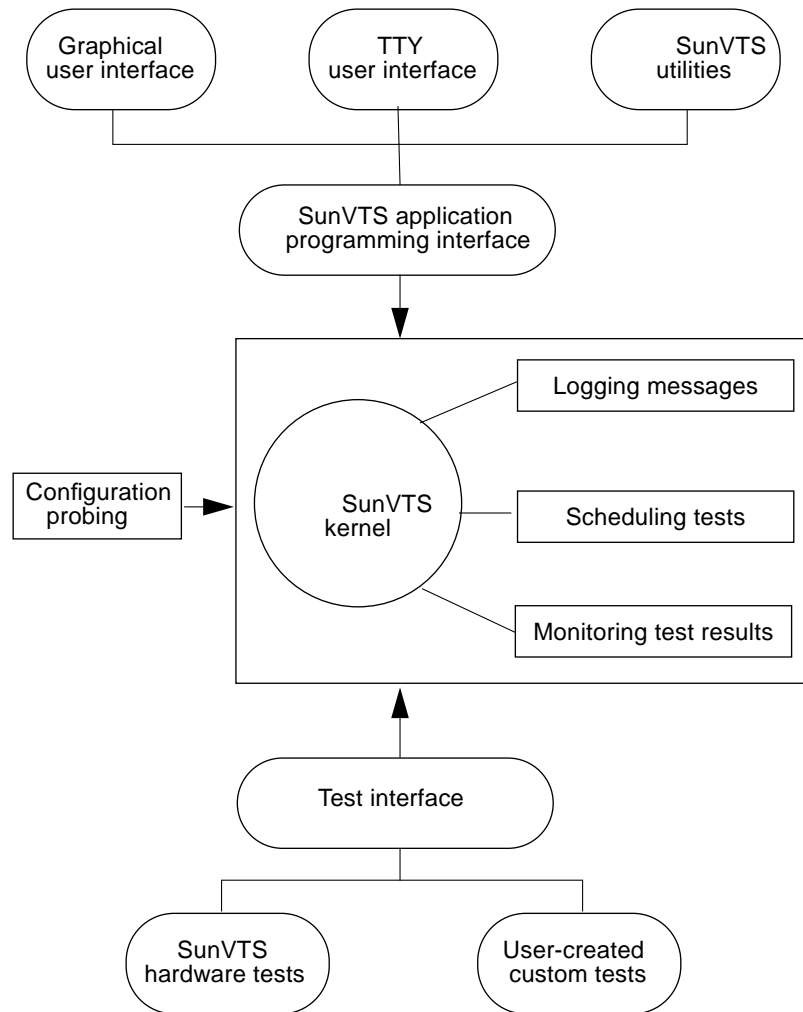


Figure 1-1 SunVTS Architecture

List of SunVTS Features

Table 1-1 lists and describes SunVTS features. You can find more information about a specific feature by going to the page number listed.

Table 1-1 List of SunVTS Features

Feature	Description	Page No.
Advanced Options	Provides a way to lock test or group options from being reset by global option settings	page 54, 84
Auto Start	Runs SunVTS when first started	page 54
Connectivity Test Mode	Specifies very low stress testing of the available devices	page 78
Connect to	Displays the Connect to(Machine) window, where you can connect to another machine on the network that is running the SunVTS kernel, or reconnect to the SunVTS kernel	page 50
Console Panel	Displays the error messages from the SunVTS kernel and the hardware tests	page 41
Core File	Sends messages to a Core file that is associated with the test	page 54
Custom Tests	Contains a set of custom-developed tests	page 100
Display	Displays the hardware configuration of the associated test selected	page 60
Elapsed Time	Displays how long (in the format of hh:mm:ss) SunVTS has been testing your system	page 38
Email Address	Specifies the email address where status mailings will be sent	page 54
Errors	Indicates the number of times a test, or a test within a test group, has exited with an error	page 38
Graphics	Contains the tests that validate the system's graphics adapters; select this button to display group system options, where you can set the group system options for the tests in this group	page 87
Group Concurrency	Sets this option to the number of tests you want to run at the same time in the same group	page 54
Group Lock	Protects changes in the Set Options window for this test group	page 54
Group Override	Overrides any locked test options in the test group in favor of the options displayed in the Set Options window	page 54
Intervention	Enables or disables running tests that require user intervention; these tests require the user to either install loopback connectors or to intervene while the test validates the hardware	page 54

Table 1-1 List of SunVTS Features

Feature	Description	Page No.
Log Files	Displays the Log Files window where you can display, print, or remove the SunVTS log files; these log files contain the messages created by the SunVTS kernel, tests, and the operating system (UNIX)	page 62
Logical Mapping	Groups tests according to the tested device's function	page 77
Log Period	States the time, in minutes, between testing status email messages	page 54
Max Errors	States the maximum number of errors a test encounters before stopping (0=infinity)	page 54
Max Passes	Specifies the maximum number of passes a test can run	page 54
Max System Errors	States the maximum number of system errors that can occur before the SunVTS stops all tests (a value of 0 makes the SunVTS kernel continue testing regardless of errors)	page 54
Max Time	Specifies the maximum number of minutes that SunVTS continues testing; a value of 0 makes the SunVTS kernel run the selected tests until you click the Stop button	page 54
Memory	Contains the tests that validate the system's subsystem; select this button to display group system options, where you can set the group system options for all the tests in this group	page 82
Network	Contains the tests that validate the system's network adapters; select this button to display group system options, where you can set the group system options for all the tests in this group	page 19
Notify	Instructs SunVTS how to announce testing status	page 31
Number of Instances	Specifies the number of instances to run each scalable test	page 54
Offline Test Mode	All system resources are available for testing in this mode; specifies testing at a higher level of stress	page 79
Online Test Mode	Specifies a thorough but non-intrusive test mode	page 79
Option Files	Displays the Option Files Window, where you can load, store, and remove option files; option files contain all the system and test options of a specific test session; once saved, these options can be loaded during a later test session	page 59
OtherDevices	Contains the tests that validate the devices that are <i>not</i> part of the Graphics, SCSI-Devices, Processes, Network, Memory, Comm.Ports groups; select this button to display a group system options window, where you can set the group system options for all the tests in this group	page 59

Table 1-1 List of SunVTS Features

Feature	Description	Page No.
Processor Affinity	Lets you specify the processor on which you want to run the tests; only available on multiprocessor systems	page 54, page 97
Passes	States the number of times a test, or test group, completes one pass	page 38
Performance Meter	Monitors the system performance, such as the percentage of CPU being used, the jobs being swapped per second, and the errors per second on receiving packets	page 45
Physical Mapping	Groups tests according to their physical location	page 77
Print	Prints the hardware configuration of a test system when accessed from the Sys Config sub-menu	page 60
Processor(s)	Contains the tests that validate the system's Processes; select this button to display a group system options window, where you can set the group system options for all the tests in this group	page 54
Quit	Terminates the User Interface, the SunVTS kernel, or both	page 23
RePlay	Replays a recorded testing session	page 88
Reprobe System	Reprobes the test system devices; use this option when you add or remove devices from a system	page 43
Reset	Resets the information on the System Status and Test Status panels	page 48
Resume	Resumes a paused testing session	page 49
Run On Error	Continues testing until the default error count of three is reached	page 54
Scalability	Increases test scale to fully stress single and multiprocessor systems; scalable tests can be modified so that multiple instances (or copies) of them can be run on a device simultaneously	page 85
Scheduling	Specifies when SunVTS runs enabled tests	page 54
SCSI-Devices	Contains the tests that validate the system's SCSI-Devices; select this button to display a group system options window, where you can set the group system options for all the tests in this group	page 54
Send Email	Sends test status messages via email	page 54
Set Options	Sets the SunVTS kernel, test group, and test system options	page 54
Single Pass	Runs only one pass of each selected test	page 54
Start	Starts the testing session	page 14
Start with Record	Starts and records a testing session	page 84

Table 1-1 List of SunVTS Features

Feature	Description	Page No.
Stop	Stops a testing session	page 48
Stress	Increases test performance; only available for some tests	page 54
Suspend	Pauses a testing session; once selected, this button changes to Resume	page 48
System Concurrency	Runs a set number of tests at the same time in the entire system; overrides the Group Concurrency option	page 54
Sys Config Menu	Displays the test system's hardware configuration, prints the test system's configuration, and reprobes the test system's devices	page 60
System Override	Supersedes the group and test options in favor of the options in the Set Options window	page 54
System Passes	States the number of times all enabled tests are completed	page 38
System Status	Displays the status of the testing session, which can be idle, testing, stopping, recording, suspended, or replay	page 38
System Map	Selects the desired system device mapping (physical or logical)	page 63
Terminate Kernel Only	Quits the SunVTS kernel and not the user interface	page 23
Terminate User Interface & Kernel	Quits the SunVTS kernel <i>and</i> the user interface	page 23
Terminate User Interface Only	Quits the user interface and leaves the SunVTS kernel running in the background	page 23
Test Execution	Displays the system or group option window for a system or specific group of tests; the options on this window only affect the specified group of tests	page 54
Test Lock	Protects the specific test options from being changed by the group or Set Options windows	page 54
Test Mode	Selects the SunVTS testing modes (connectivity, online, offline)	page 54
Test Options	Displays the test options of the selected test; these options are different from the system options; for more information about a specific test option, refer to the <i>SunVTS Test Reference Manual</i>	page 54
Test Set	Selects the default set of hardware tests, no tests, or all tests	page 60
Test Status Icons	Changes the Test Status panel listing; use the icons to page forward and backward on the Test Status panel, goes to the vicinity of a specific test, or displays only the tests that produce errors.	page 43
Thresholds	Sets the maximum number of system passes, errors, and time; specifies when test execution should be stopped	page 54

Table 1-1 List of SunVTS Features

Feature	Description	Page No.
Total Errors	Displays the total number of fatal errors produced by the tests; these errors do not include the verbose messages and system call messages	<i>page 91</i>
Trace Test	Traces system calls and signals for selected tests as described in <code>truss(1)</code>	<i>page 51</i>
Verbose	Displays verbose messages in the SunVTS console window	<i>page 54</i>

Using SunVTS



SunVTS 2.0 is not compatible with previous versions. Earlier user interfaces, tests, and option files will not work with the SunVTS 2.0 kernel, and vice versa.

Software Requirements

The default Graphical User Interface (GUI) is the Common Desktop Environment (CDE). The CDE GUI requires that the CDE End User Software be installed, or at least the SUNWdtbas package from it. See your system administrator for assistance in installing the CDE software. The CDE GUI will run on either the OPEN LOOK desktop or the CDE desktop.

You must meet the following requirements to run SunVTS with OPEN LOOK:

- Run Solaris 2.5 operating system
- Run OPEN LOOK, Version 3.3 or later
- Set the correct `openwin` path
Set the `OPENWINHOME` environment variable to point to the location where OPEN LOOK is installed on your system. You can ignore this requirement if you use the default location, `/usr/openwin`.

Otherwise, use the following command and substitute the *pathname* variable for the actual path where OPEN LOOK is installed.

```
ariela% setenv OPENWINHOME pathname
```

Check the existing `OPENWINHOME` by typing `env`

- Set the correct library path.
Set the `LD_LIBRARY_PATH` environment variable to point to the location of the Windows library directory on your system. If you use the default location, `/usr/openwin/lib`, you can ignore this requirement.

Otherwise, use the following command and substitute the *pathname* variable for the actual path where OPEN LOOK library is installed.

```
ariela% setenv LD_LIBRARY_PATH pathname
```

Check the existing `LD_LIBRARY_PATH` by typing `env`

Before Starting SunVTS

Note – Do not use the ampersand (&) to run SunVTS in the background.

Read the `sunvts` syntax descriptions in Table 2-1 before starting SunVTS. If you want to start SunVTS without using any of those options, type the `sunvts` command in the SunVTS `bin` directory, which is `/opt/SUNWvts/bin` by default.

```
# /opt/SUNWvts/bin/sunvts
```

The SunVTS GUI interface is displayed if a window environment is running; if not, the SunVTS TTY interface is displayed. If the SunVTS kernel (`vtstk`) is already running on your system, `sunvts` only starts the user interface.

Note – When SunVTS is invoked the default GUI is selected according to the following criteria: if CDE libraries are installed, the default GUI will be CDE; if `openwin` is installed the default GUI will be OPEN LOOK; if neither one of these GUIs is installed, the default will be TTY.

Table 2-1 shows the full syntax of the `sunvts` command.

Table 2-1 The `sunvts` Syntax

```
/opt/SUNWvts/bin/sunvts [-tqpvsel] [-o options_file] [-f logfile_directory] [-h hostname]
```

Argument	Description
<code>-e</code>	Disables the connection permission checking feature
<code>-f logfile_directory</code>	Specifies an alternative logfile directory, other than the default directory <code>/var/adm/sunvtslog</code>
<code>-h hostname</code>	Starts the user interface (either <code>vtsui</code> or <code>vtstty</code>) on the local machine and tries to connect to the SunVTS kernel (<code>vtsk</code>) of the specified host machine. If <code>hostname</code> is the same hostname of the machine on which the tests are being run, <code>sunvts</code> starts the SunVTS kernel (<code>vtsk</code>). If <code>vtsk</code> is already running on the test system, the <code>sunvts</code> application ignores the <code>-o</code> , <code>-f</code> , <code>-q</code> , <code>-p</code> , and <code>-s</code> options
<code>-l</code>	Starts the OPEN LOOK user interface
<code>-o options_file</code>	Starts the SunVTS kernel with the test options loaded from the <code>option_file</code> ; these options are saved by the user interface and stored in the <code>/var/opt/SUNWvts/options</code> directory
<code>-p</code>	Starts the SunVTS kernel, but does not probe the test system's devices
<code>-q</code>	Automatically quits both the SunVTS kernel and the user interface when testing stops
<code>-s</code>	Automatically starts testing a selected group of tests; the flag must be used with the <code>-o options_file</code> flag
<code>-t</code>	Starts <code>vtstty</code> , a TTY-based program, instead of a GUI. If this option is not specified, and the system is running CDE, <code>sunvts</code> starts <code>vtsui</code> ; or, if the system is running OPEN LOOK, <code>sunvts</code> starts <code>vtsui.ol</code>
<code>-v</code>	Displays version information from the SunVTS kernel and GUI

Adding and Removing Devices

Follow these procedures to add and remove device drivers in the Solaris operating system environment:

▼ To Add a Device

1. Verify that the corresponding device driver is installed correctly.
2. Halt the system using the `init 0` command.

3. **Connect the device to the system.**
4. **Reboot your machine with the `boot -r` command.**

The system probes all attached hardware devices and assigns nodes in the file system to represent only those devices that are actually found. It also configures the logical namespace in `/dev`, as well as the physical namespace in `/devices`.

▼ **To Remove a Device from the System**

1. **Halt the system using the `init 0` command.**
2. **Disconnect the device.**
3. **Reboot the system with the `boot -r` command before starting SunVTS.**

Starting SunVTS

This section tells you how to start both the SunVTS kernel and a user interface. You can also start SunVTS remotely, on a standalone system, and with or without starting the kernel or user interface. These options are covered in Chapter 3, “User Interfaces”.

In a Window Environment

- ◆ **To start the SunVTS kernel (`vtstk`) and the CDE GUI (`vtsui`) type:**

```
# /opt/SUNWvts/bin/sunvts
```

- ◆ **To start the SunVTS kernel (`vtstk`) and the OPEN LOOK GUI (`vtsui.ol`) type:**

```
# /opt/SUNWvts/bin/sunvts -l
```


In TTY Mode

To start the SunVTS kernel (`vtsk`) and the TTY-based user interface (`vtstty`), specify the `-t` option by typing:

```
# /opt/SUNWvts/bin/sunvts -t
```

Using Other Commands to Start SunVTS

The `sunvts` application starts both the SunVTS kernel and a user interface. In some situations, however, you may not want to start both the kernel and the user interface. If the test machine is already running the SunVTS kernel, you may only want to start the user interface. On the other hand, you may want to start just the SunVTS kernel and leave it running as a background process.

◆ To start the SunVTS kernel using `vtsk` type:

```
# /opt/SUNWvts/bin/vtsk
```

The SunVTS kernel then probes the system devices and waits for commands from an interface. See Table 2-2 for the `vtsk` application syntax.

Table 2-2 The `vtsk` Syntax

Argument	Description
<code>-e</code>	Disables the connection permission checking feature
<code>-f logfile_directory</code>	Specifies an alternative logfile directory, other than the default <code>/var/opt/SUNWvts/logs</code> directory
<code>-o</code>	Starts the SunVTS kernel with the test options saved in the <i>option_file</i> ; these options are saved and stored in the <code>/var/opt/SUNWvts/options</code> directory
<code>-p</code>	Starts the SunVTS kernel, but does not probe test system devices

Table 2-2 The `vtsk` Syntax (Continued)

<code>/opt/SUNWvts/bin/vtsk [-epqsv] [-o options_file] [-f logfile_directory]</code>	
Argument	Description
<code>-q</code>	Quits both the SunVTS kernel and the user interface when testing is complete
<code>-s</code>	Starts testing a selected group of tests; the flag must be used with the <code>-o options_file</code> flag
<code>-v</code>	Displays only the version information from the SunVTS kernel, <code>vtsk</code> ; this option does not start the <code>vtsk</code> daemon

◆ To start only the OPEN LOOK interface, type:

```
% /opt/SUNWvts/bin/vtsui.ol
```

◆ To start only the CDE interface, type:

```
% /opt/SUNWvts/bin/vtsui
```

Note – You do not need to be superuser (root) to start the user interface.

If the SunVTS kernel is running on the test system, `vtsui.ol` (or `vtsui`) automatically connects to this kernel to start the OPEN LOOK (or CDE) interface.

▼ To Connect to a Remote Machine's SunVTS Kernel

◆ To start the OPEN LOOK interface type:

```
% ./vtsui.ol -h hostname
```

◆ To start the CDE interface type:

```
% ./vtsui -h hostname
```

Table 2-3 contains a complete listing of the `vtsui` arguments.

Table 2-3 The `vtsui` Syntax

<code>/opt/SUNWvts/bin/vtsui.ol</code> (or <code>vtsui</code>) <code>[-v]</code> <code>[-h hostname]</code> <code>[-q quit]</code>	
Argument	Description
<code>-h hostname</code>	Starts the user interface and attempts to connect to the SunVTS kernel (<code>vtsk</code>) of the specified host machine
<code>-q</code>	Quits <code>vtsui.ol</code> when testing is completed
<code>-v</code>	Prints the version number of <code>vtsui.ol</code>

Using `vtstty` to Start the TTY Interface

If the SunVTS kernel (`vtsk`) is already running on the test system, you can use the `vtstty` command to start the SunVTS TTY interface. This command can be found in the SunVTS `bin` directory, `/opt/SUNWvts/bin`.

◆ To start the TTY interface, type:

```
% /opt/SUNWvts/bin/vtstty
```

Note – You do not need to be superuser (`root`) to start the user interface.

If the SunVTS kernel is running on the test system, `vtstty` automatically connects to this kernel and start the TTY interface.

◆ To connect to a remote machine's SunVTS kernel, type:

```
% /vtstty -h hostname
```

See Table 2-4 for a complete listing of the `vtstty` arguments.

Table 2-4 `vtstty` Syntax

<code>/opt/SUNWvts/bin/vtstty [-v] [-h hostname]</code>	
Argument	Description
<code>-h hostname</code>	Starts the user interface (<code>vtsui</code> or <code>vtstty</code>) and attempts to connect to the SunVTS kernel (<code>vtsk</code>) of the specified host machine
<code>-v</code>	Displays version information from <code>vtstty</code>

▼ To Run the TTY Interface in a `telnet` or `tip` Window

If you want to display the SunVTS TTY interface on a `telnet` or `tip` window, you need to set the correct terminal type and the number of columns and rows in the window *before* starting the interface.

1. Before starting the telnet session, type `stty` to display the settings of the terminal.

```
hostname% stty
speed 9600 baud; -parity hupcl
rows = 39; columns = 94; ypixels = 0; xpixels = 0;
swtch = <undef>;
brkint -inpck -istrip icrnl -ixany imaxbel onlcr
echo echoe echok echoctl echoke iexten
```

Note – Write down the values of the rows and columns settings. You will need these values in Step 4.

2. Connect to the test system using either the `tip` or `telnet` commands.

Note – Refer to the `telnet(1)` and `tip(1)` man pages for more information about these protocols.

3. Set the correct terminal type.

In this example, the terminal is a Sun.

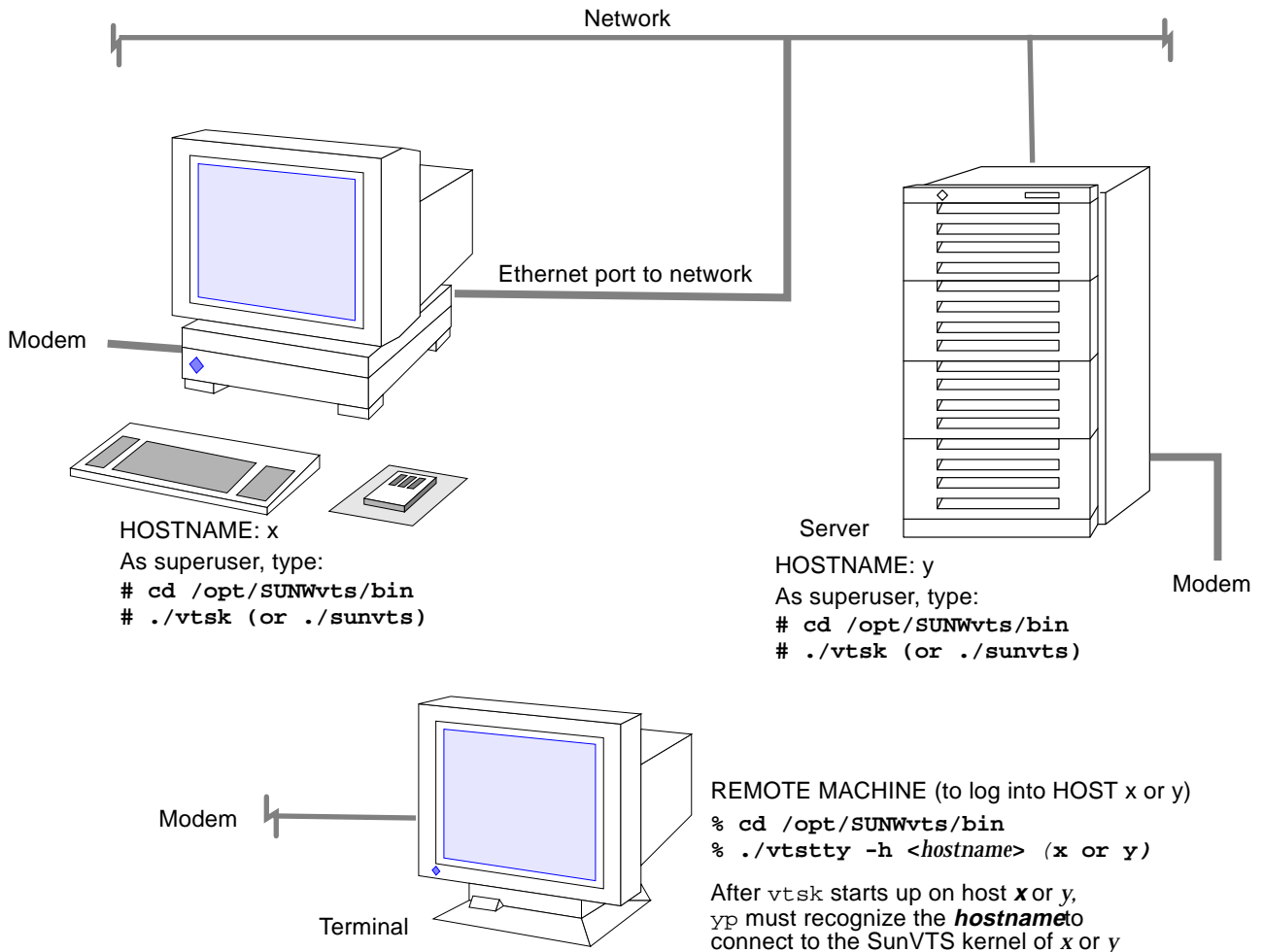
```
remotehost% set term=sun-cmd
```

4. Use the `stty` command to set the number of rows and columns in the window.

```
remotehost% stty rows 39  
remotehost% stty columns 94
```

Using SunVTS on a Remote Machine

You can view and control a SunVTS testing session over modem lines or over a network. Using a remote machine, you can view the progress of a testing session, change testing options, and control all testing features of another machine on the network. Figure 2-1 and Figure 2-2 show examples of how to connect to a remote machine over modem lines and over a network.



NOTE: If /etc/inetd.conf was modified to start vtsk automatically when there is an RPC request from the user interface, vtsk does not have to be started manually. This inetd.conf file will normally be modified during SUNWvts package installation.

Figure 2-1 Using SunVTS Over Modem Lines

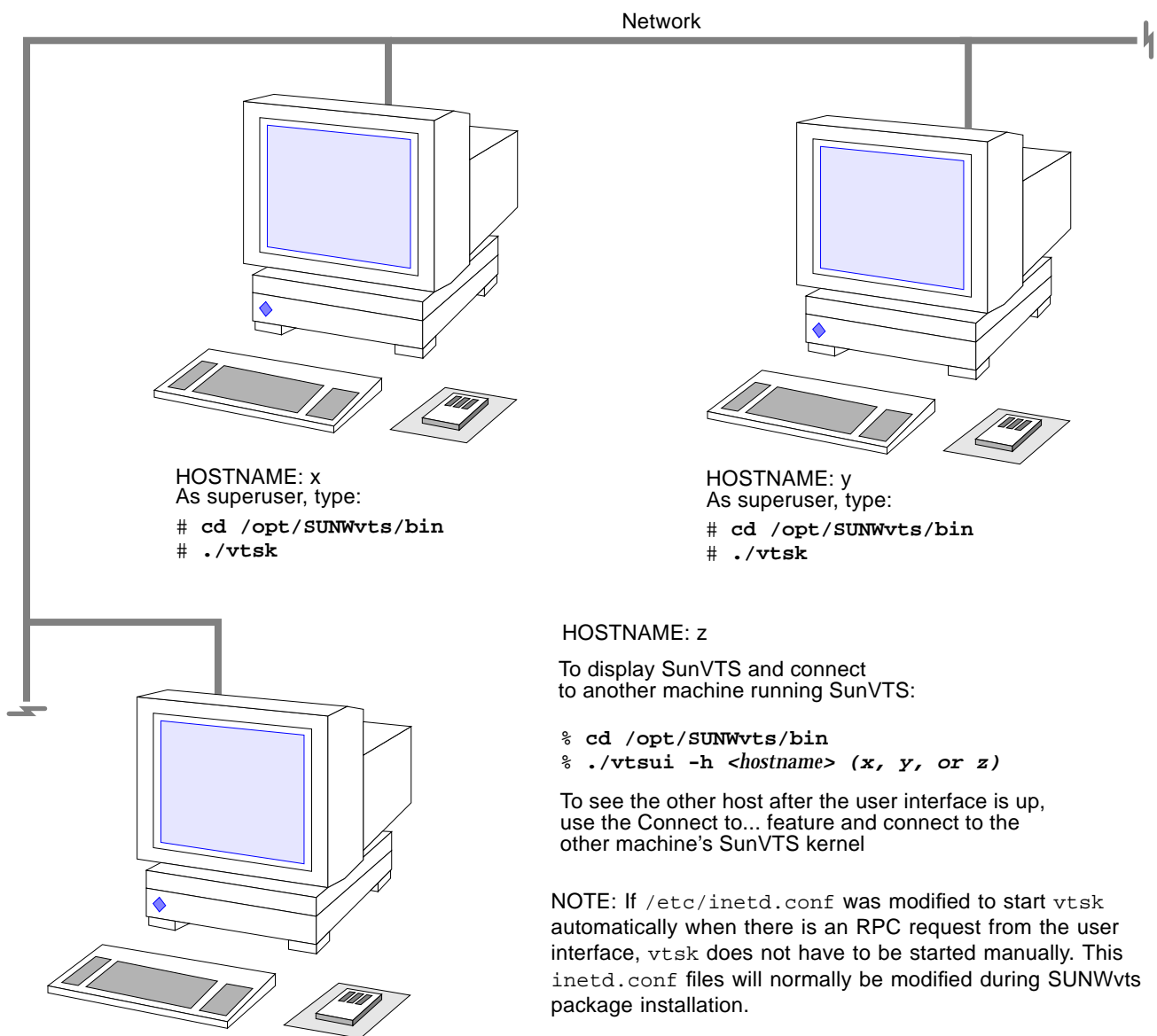


Figure 2-2 Using SunVTS Over the Network

You can run SunVTS on a remote machine two ways:

- Connect the user interface to the SunVTS remote machine using the `-h hostname` option.
- Remotely log on to the machine as superuser, start the SunVTS kernel, and display the user interface on your machine.
- ◆ **To connect the User Interface to a Remote SunVTS Kernel, specify the `-h hostname` option, by typing:**

```
# /opt/SUNWvts/bin/sunvts -h remote_hostname
```

If the user interface is already running on your local machine, you can use the Connect to option to connect to a remote machine's SunVTS kernel. (See "Connect to Button" in Chapter 3 for more instructions.)

Note – If you run SunVTS in the OPEN LOOK environment, you must have display permissions.

▼ To Run SunVTS (Kernel and User Interface) on a Remote Machine

1. Use `xhost` to give remote server access to your system before logging in.

```
% /usr/openwin/bin/xhost + remote_hostname
```

2. Replace `remote_hostname` with the remote machine hostname.
3. Log into the remote machine as superuser (root).
4. Change directories to the SunVTS `bin` directory, which is `/opt/SUNWvts/bin` by default.
5. Use the `sunvts` application to start the SunVTS kernel and display the user interface on your machine:

```
# ./sunvts -display local_hostname:0
```

6. Replace `local_hostname` with your local machine's hostname.

Running SunVTS on a Standalone System

Some SunVTS applications require a network connection to run successfully. However, you can run SunVTS on a standalone system.

▼ To Run SunVTS on a Standalone System

1. **Edit the `/etc/rc2.d/S72inetsvc` script file, and comment out the following line:**

```
# /usr/sbin/ifconfig -au netmask + broadcast +
```

2. **Comment out any remotely mounted file systems from the `/etc/vfstab` file.**
Remotely mounted file systems are not required on a standalone system.
3. **Make sure `ypbind` is not running on the standalone system.**
Doing this step ensures that `ypbind` is not started by the `rc` scripts.
4. **Reboot your system.**
SunVTS can now run properly on a standalone machine.

Using `inetd` to Invoke the SunVTS Kernel (Auto Invoke)

With the `inetd` feature, you no longer have to start up the `sunvts` kernel before attempting to connect to it. This new feature uses the `inetd` system facility that automatically triggers the `sunvts` kernel when a user interface connection request is received.

When the `sunvts` package is installed, all relevant setup files are modified. These same files are later cleaned up when the package is removed.

Quitting SunVTS

Before quitting SunVTS, click the Stop button at the top of the control panel to stop any tests that are running. Some of the tests, such as the tape tests, may be delayed before stopping because they require additional time to rewind.

You can quit from the Quit Option menu three ways.

◆ **Go into the Commands menu and select the Quit SunVTS sub-menu. This sub-menu displays the following choices:**

- `vts kernel and ui` - terminates the user interface and the SunVTS kernel
- `vts kernel` - terminates only the SunVTS kernel
- `vts ui` - terminates only the user interface

Security

The SunVTS user interface running on one host can control the SunVTS kernel running on a system under test (SUT). The user interface has to connect to the SunVTS kernel *before* it can control the SunVTS kernel (see “Connect to Button” in Chapter 3 for more information).

The SunVTS kernel authenticates connect requests from the SunVTS interfaces based on one of the following attributes:

- The host from which the request is initiated. If this host belongs to the list of trusted hosts specified, then this request is granted without any authentication.
- The group *<groupname>* to which the user using a SunVTS UI to SunVTS kernel belongs to. This is the user who initiates the Connect to request. If this group is a member of a list of groups specified, then the user interface will prompt the user for a password. The SunVTS kernel compares this password against the system's databases on SUT. If the password does not match, or the user is not in the list, then the connection is rejected.
- The user *<username>* who initiates the Connect to request using a SunVTS User Interface to the SunVTS kernel (`vtsk`). If this user is a member of a list of users specified, then the user interface will prompt the user for a password. The SunVTS kernel compares this password against the system's databases on SUT. If the password does not match or the user is not on the list, then the connection is rejected.

The list of hosts, groups, and users are specified in the security file, `.sunvts_sec`, which is installed in the *<SunVTS2.0 install directory>/bin*. A (+) entry in one of these lists means all hosts, groups, or users, respectively. A template of the security file (`.sunvts_sec`) is located in the *<SunVTS2.0 install directory>/bin*. See Code Example 2-1.

Note – To enable security checking, remove the plus (+) sign in the HOST section of the default `.sunvts_sec`.

Code Example 2-1

```
#This file should be <SunVTS2.0 install directory>/bin/.sunvts_sec
#
#Any line beginning with a # is a comment line
#
# Trusted Hosts entry
# One hostname per line.
# A "+" entry on a line indicates that ALL hosts are Trusted Hosts.
# No password authentication is done.
# The line with the label HOSTS: is required to have the list of hosts
#
#HOSTS:
+
#host1
#host2
#
# Trusted Groups entry
# One groupname per line.
# A "+" entry on a line indicates that ALL groups are Trusted Groups.
# User password authentication is done.
# The line with the label GROUPS: is required to have the list of groups
#
#GROUPS:
#group1
#
# Trusted Users entry
# One username per line.
# A "+" entry on a line indicates that ALL users are Trusted Users.
# User password authentication is done.
# The line with the label USERS: is required to have the list of users.
#USERS:
#user1
#user2
```

The SunVTS kernel authenticates the request(s) based on the entries in the security file. Any invalid entry or no entries in the security file results in the denial of any access except `root` on the local machine. An incorrect entry in this file can be corrected even when the SunVTS kernel is running. If the `-e`

option is used with the SunVTS kernel, then the SunVTS kernel accepts Connect to requests from any host, regardless of the user identification of the SunVTS User Interface process that is initiating it.

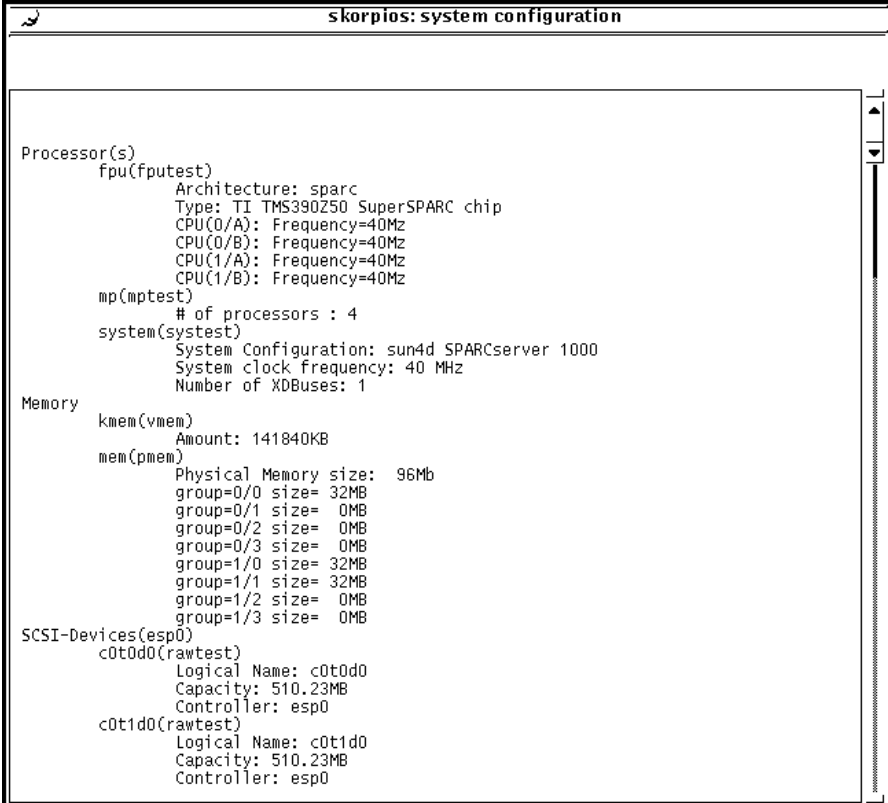
Note – The user password needed for authentication purposes by `vt.sk` is the same password used by the user to login to the SUT.

System Configuration

From the Sys Config menu you can check all the devices connected by:

- Displaying test system configuration information
- Printing test system configuration information
- Reprobing the test system
- ◆ **To see the hardware configuration of the test system, select Display from the Sys Config menu.**

The Configuration window appears (Figure 2-3) and lists all of the hardware on the test system and their corresponding hardware tests.

The image shows a window titled "skorpios: system configuration". The window contains the following text:

```
Processor(s)
  fpu(fputest)
    Architecture: sparc
    Type: TI TMS390Z50 SuperSPARC chip
    CPU(0/A): Frequency=40Mz
    CPU(0/B): Frequency=40Mz
    CPU(1/A): Frequency=40Mz
    CPU(1/B): Frequency=40Mz
  mp(mptest)
    # of processors : 4
  system(systemst)
    System Configuration: sun4d SPARCserver 1000
    System clock Frequency: 40 MHz
    Number of XDBuses: 1
Memory
  knem(vmem)
    Amount: 141840KB
  mem(pmem)
    Physical Memory size: 96Mb
    group=0/0 size= 32MB
    group=0/1 size= 0MB
    group=0/2 size= 0MB
    group=0/3 size= 0MB
    group=1/0 size= 32MB
    group=1/1 size= 32MB
    group=1/2 size= 0MB
    group=1/3 size= 0MB
SCSI-Devices(esp0)
  c0t0d0(rawtest)
    Logical Name: c0t0d0
    Capacity: 510.23MB
    Controller: esp0
  c0t1d0(rawtest)
    Logical Name: c0t1d0
    Capacity: 510.23MB
    Controller: esp0
```

Figure 2-3 Typical System Configuration

Printing System Configuration Data

▼ To Print the Hardware Configuration of the Test System

1. Select the Print option from the Sys Config pull-down menu.

A Print Configuration window is displayed (see Figure 2-4).

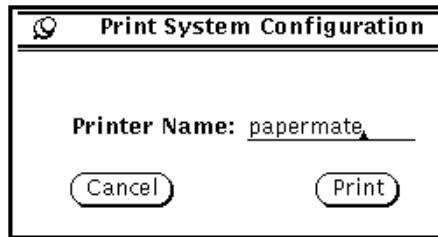


Figure 2-4 Print System Configuration Window

2. Type the name of your printer in the Printer Name field.
3. Click the Print button.

▼ To Display Log Files

SunVTS saves the status of its progress in three types of log files.

- SunVTS Error Status Log - the `sunvts.err` file contains SunVTS test error messages and start and stop times.

```
/var/opt/SUNWvts/logs/sunvts.err
```

- SunVTS Information Log - the `sunvts.info` file contains informative messages generated while starting and stopping SunVTS.

```
/var/opt/SUNWvts/logs/sunvts.info
```

- Solaris System Message Log - the `messages` file is a log of all the general UNIX messages.

```
/var/adm/messages
```

You can access these files from the Log Files Menu, which is displayed when you click the Log Files button (see Figure 2-5).

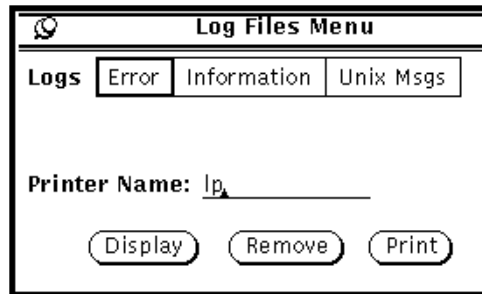


Figure 2-5 Log Files Menu

◆ **Select the type of Log file. Click the Display button.**

A pop-up window displays the selected Log file. The Log file's name appears at the top of the window. See Figure 2-6.

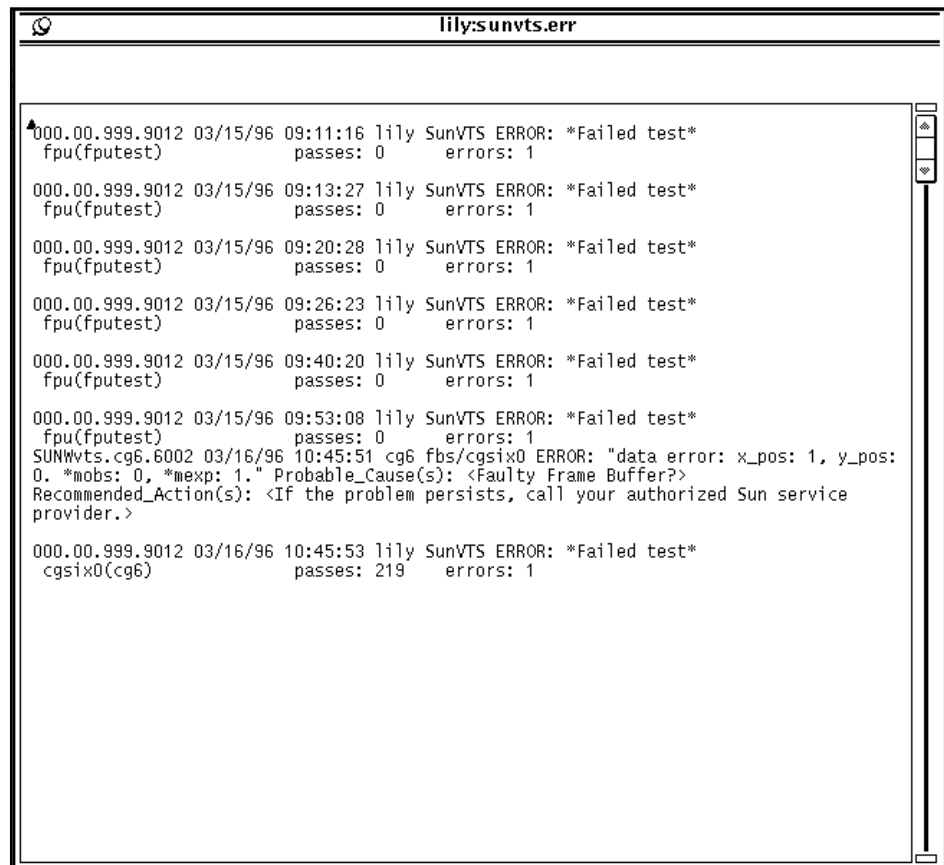


Figure 2-6 SunVTS Info Log File

- ◆ **To remove Log Files click the Remove button on the Log Files pop-up window.**
- ◆ **To print Error Logs click the Print button on the Log Files pop-up window.**

Note – These logs can be very long. Make sure you want the entire file before printing it.

Notification by Email

This feature instructs the SunVTS kernel to send the last couple of lines in the SunVTS error message file to a particular person or alias under certain circumstances during the testing.

You can use the Notify pop-up menu in the Set Options menu to send to the destination email address (see Table 2-5).

Note – Make sure the email address specified is valid by sending a test email.

Table 2-5 Notification by Email

Option	Description
Email Address	Indicates the email address where the test status messages are sent (the address is <code>root</code> by default)
Log Period	Sets time periods for receiving emails
Send Email	Determines when and if you want the test status messages sent to you through email. From this menu, you can choose: <ul style="list-style-type: none">- Disabled (do not send mail)- Now (send mail immediately)- On Error (send mail when an error occurs)- Periodically (send mail with a time period set in the Log Period option)- On Error & Periodically (send mail when an error occurs as well as periodically)

Runtime Considerations

Managing your swap space and running other applications while running SunVTS require special attention. A detailed discussion of these issues follows.

Managing Swap Space

The amount of SunVTS swap space required varies widely with individual hardware and software configurations. Most systems have enough swap space already configured to meet SunVTS testing requirements.

When you start using SunVTS the amount of swap space required for testing is calculated. First, a calculation is done to determine the amount of available swap space on the system being tested. Next, the amount of swap space needed to run the program, various tests, and virtual memory is calculated.

If an adequate amount of swap space is not available on your machine, a window pops up (see Figure 2-7). This pop-up window displays the amount of additional swap space needed to run the selected diagnostic tests. In this example, `lightspeed` is the hostname and `audio` is an example of a test that could not be started.

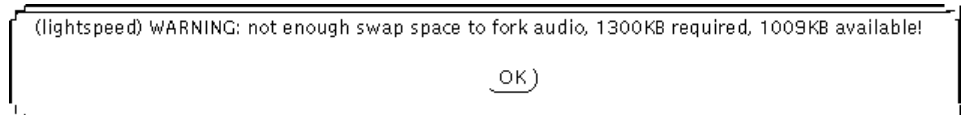


Figure 2-7 Swap Space Warning Message

If swap space is not available on your machine to run all of SunVTS tests, you can either deselect some of the tests or you can add more swap space. (Refer to the *Solaris Administering File Systems* manual for information about increasing swap space.)

Note – If your system does not have enough swap space configured, some SunVTS tests may run very slowly or the screen may freeze. If this occurs, the SunVTS kernel usually returns error messages, indicating that the problem is due to insufficient swap space.

Heavy System Load Response

Sluggish response on the SunVTS user interface is normal during heavy testing loads. The SunVTS kernel response could cause the user interface to time-out. If this happens, reconnect to the SunVTS kernel by using the Connect to option.

During periods of heavy testing, use the Suspend option to suspend testing while viewing log files or Sys Config files, to invoke specific commands, or to change options. When the user interface interaction is completed, select the Resume option to continue testing.

Running Other Applications and SunVTS

The SunVTS virtual memory test (`vmem`) is designed to stress test the virtual memory of the system; doing this uses much of the system's swap space. Because `vmem` may use all of the system's remaining swap space, you may not be able to run any other process while testing the system.

The best way to run other non-SunVTS processes (for example, other OPEN LOOK applications) while using SunVTS, is to start these processes *before* you begin running the tests.

Reserve Option to `vmem`

The `vmem` Reserve option lets you reserve swap space for other processes from each instance of the test.

If you plan to start other processes after you start the virtual memory test, you can use the `vmem` reserve option to set aside swap space for these processes *before* you begin testing.

For example, if you are running 4 instances of the test and you need 20 Mbytes of swap space for the applications, you can reserve 5 Mbytes of swap space from each of the 4 instances of the test.

You can select the Reserve option from either the `vmem` test options menu (within the SunVTS control panel) or from the command line.



Caution - If `metadisk` (online disk suite) is running, SunVTS may corrupt data on the metadisk. In this case, before starting SunVTS, set the system environment variable `BYPASS_FS_PROBE` to 1.

For example:

```
# BYPASS_FS_PROBE=1; export BYPASS_FS_PROBE
# ./sunvts
```

User Interfaces



SunVTS 2.0 Graphical User Interface (GUI) has been ported to the Common Desktop Environment (CDE). The new CDE GUI will run on both the OPEN LOOK desktop and CDE, although there are additional requirements if it is run on OPEN LOOK. See details under “Software Requirements” in Chapter 2. While the CDE GUI has a new look and feel, many OPEN LOOK GUI features have been retained. The main difference between the two interfaces is how the display of device selection and testing status are handled.

CDE User Interface

When you start SunVTS using the `vtstui` application, the SunVTS CDE main window displays (see Figure 3-1).

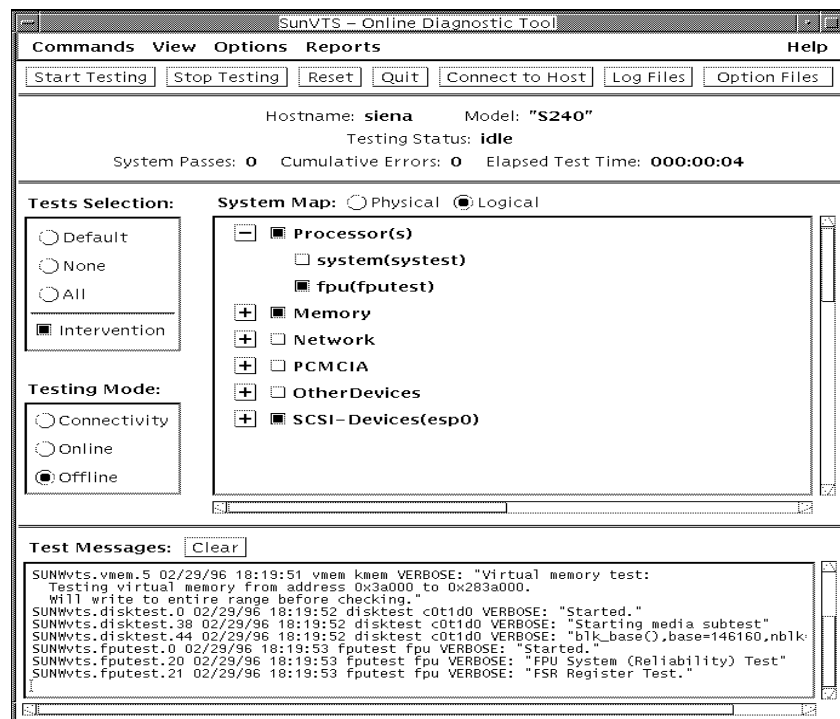


Figure 3-1 Common Desktop Environment (CDE) Display

CDE applications let you customize aspects of the GUI through a resource file. The SunVTS CDE GUI resource file lets you change font styles and colors.

The SunVTS CDE GUI resource file is in:
`/usr/openwin/lib/app-defaults/Vtsui`

Note – The main window is properly formatted with the default resource settings. Changing fonts and colors may distort the window and obscure important status information

CDE Menu Bar

The Menu Bar is located below the Main window title bar. The Menu Bar has a row of buttons and each button has a pull-down menu (see Figure 3-2).

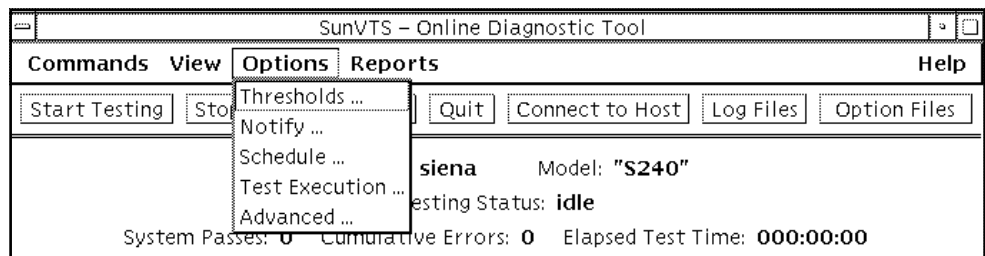


Figure 3-2 CDE Menu Bar

- Command Menu - contains a list of SunVTS control commands.
- View Menu - contains two items: The Open System Map expands each branch of the system hierarchy and displays it in the System Map window. The Close System Map closes each branch to the top level.
- Options Menu - contains a list of the system option categories. You can select a category to change system options. See Table 3-2 for a description of system options.
- Reports Menu - lists the two types of reports that you can view. The first entry lets you view system configuration information. The second entry lets you view the log files.
- Help Menu - provides online help.

CDE Tool Bar

The Tool Bar is immediately below the Menu Bar (see Figure 3-3). The Tool Bar has a set of buttons that represents the most commonly used functions from the Menu Bar. These buttons provide quick access to their functions.

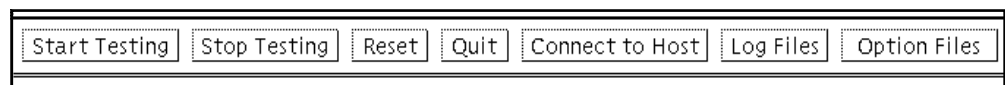


Figure 3-3 CDE Tool Bar

CDE System Status Window

The System Status window is below the Tool Bar (see Figure 3-4) which provides testing status on the overall system. In addition, it includes the name and model number of the host being tested.

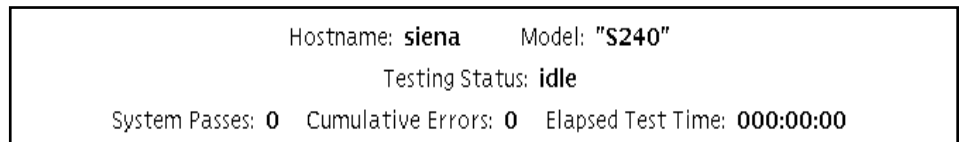


Figure 3-4 CDE System Status Window

CDE Device Selection/Status Window

The area below the system status window is divided into two parts. The left side contains the Tests Selection and Testing Mode selectors. The right side contains the System Map window. At the top of the window is a switch that lets you choose either a Physical or Logical view of the system hierarchy (see Figure 3-5).

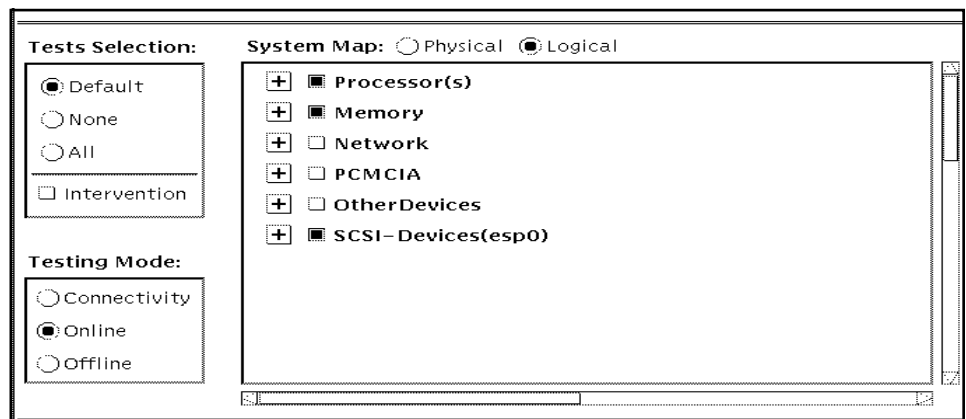


Figure 3-5 CDE Device Selection/Status Window

A new type of object called the Container button has two states to indicate that the device contains more objects. Click the “+” button to change to “-”, or open state, and display the next level of devices. This sequence continues down a branch of the system hierarchy until the device names are at their lowest level.

To select a device click the left mouse button anywhere on the device name, or on the small check box to the left of it. Click the right mouse button to display a pull-down menu of options for that device (see Figure 3-6).

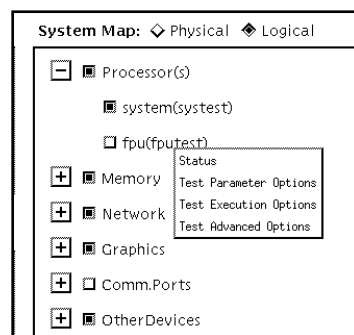


Figure 3-6 CDE Option Menu

The Option menu contains a status entry in addition to the option selections. Selecting status from the menu causes a status window to pop-up for that device (see Figure 3-7).

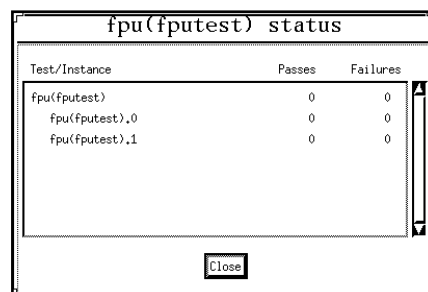


Figure 3-7 CDE Status Pop-Up Window

The status pop-up displays the testing Pass and Fail counts for the device and its immediate sub-devices. For the 'lowest level' device, it displays the test status for that device and all of the test instances below it. You can selectively choose devices that you want to monitor during testing, and can display the corresponding status pop-ups. They will be dynamically updated during testing.

Another status level that uses color displays within the System Map (see the shaded outline areas in Figure 3-8). During testing, the name of any device changes color from black to green if it has at least one pass and no failures. The moment a device has at least one failure the color of its name changes to red. This color information is propagated up an entire branch of the hierarchy, letting you keep the System Map hierarchy closed during testing. You can then view the entire system at the highest level during a test session. A branch that has no failures displays in green; those with failures are in red. To investigate any names in red, move down that branch of the hierarchy, using the container buttons, until the lowest level indicates which particular device failed.

Note – The shaded boxes in Figure 3-8 show areas that appear in color on color monitors.

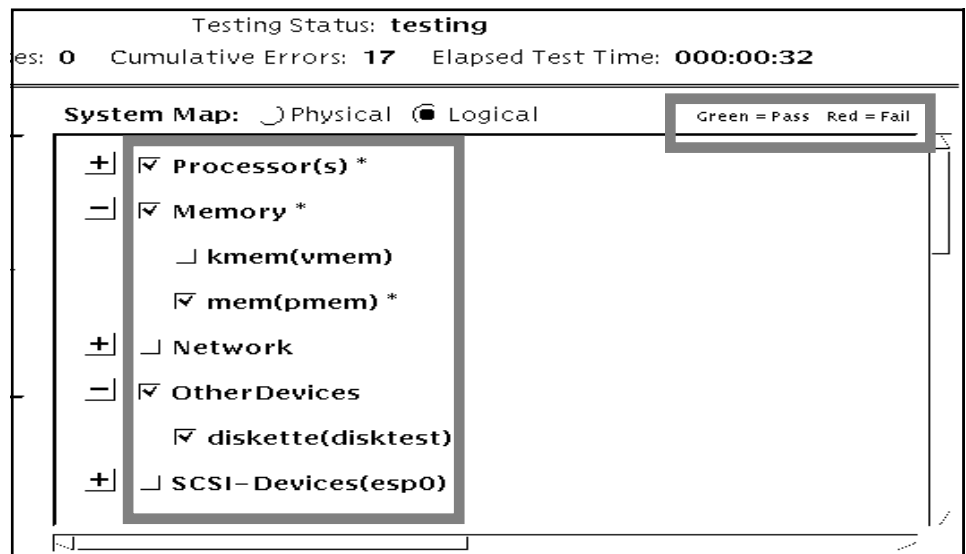



Figure 3-8 CDE System Map Window

CDE Console Panel

The Test Message console panel is at the bottom of the window (see Figure 3-9). It contains testing results and information.

A screenshot of a window titled "Test Messages:". The window contains a text area with the following text:

```
FATAL: "failed get_volmgr_name()"
SUNWvts.disktest.8082 02/27/96 23:37:31 disktest diskette
FATAL      : "failed get_volmgr_name()"
Probable_Cause(s) : (1)No Floppy Disk in Drive?
Recommended_Action(s) : (1)Check the Floppy
SUNWvts.disktest.8028 02/27/96 23:37:32 disktest diskette
FATAL: "failed get_volmgr_name()"
```

The text area has a vertical scrollbar on the right side and a horizontal scrollbar at the bottom. The window has a standard title bar and a border.

Figure 3-9 CDE Console Panel

OPEN LOOK User Interface

When you start the SunVTS `vtmui.ol` application, the OPEN LOOK Main window is displayed (see Figure 3-10).

System Status Panel

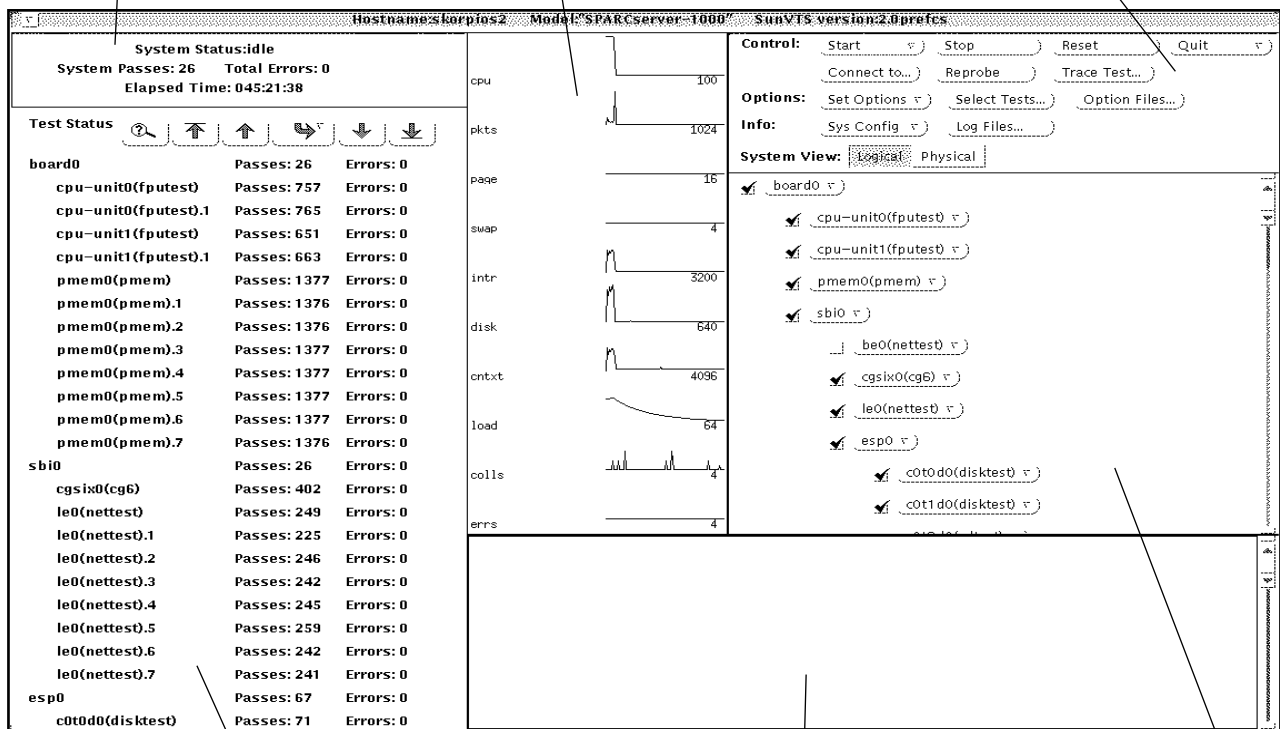
Displays the system status. See page 43

Performance Meter

Displays the same statistics as the Solaris Performance Meter program. See page 45

Control Panel

The main control panel for the SunVTS interface and global test options. See page 46



Test Status Panel

Displays the status for each test and test group. See page 43

SunVTS Console Panel

Messages are displayed in this window. See page 65

Test Selection Panel

Controls group and individual testing option. See page 63

Figure 3-10 OPEN LOOK Main Window

OPEN LOOK System Status and Test Status Panels

Figure 3-11 shows a typical system status panel.

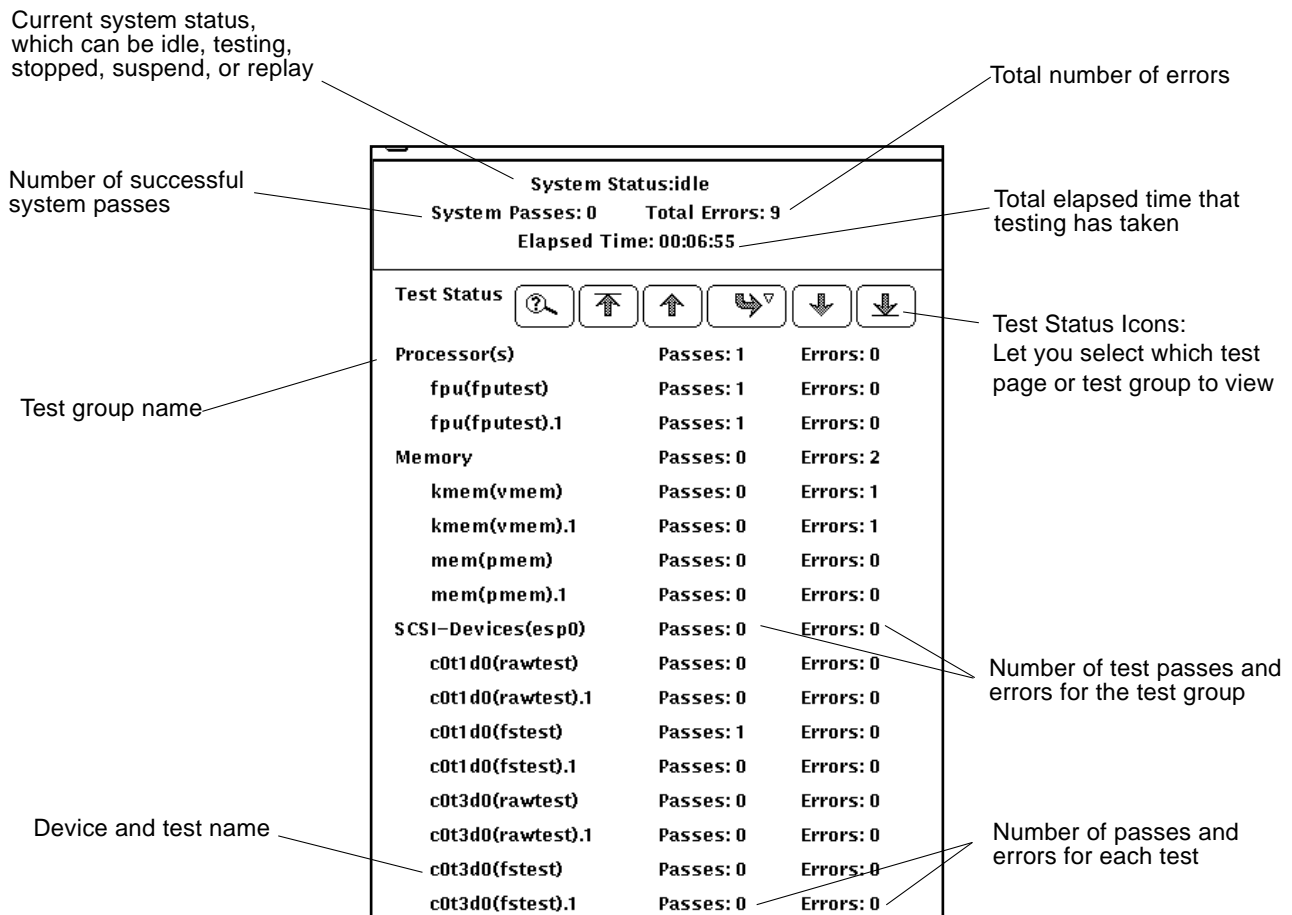


Figure 3-11 OPEN LOOK System Status Panel

Test Status Icons

Quite often, more tests are run than can be displayed on the Test Status panel. For example, there may be as many as 100 disk drive tests running on a SPARCcenter 2000 system at one time. Figure 3-12 shows the Test Status icons that let you scroll through pages of tests.

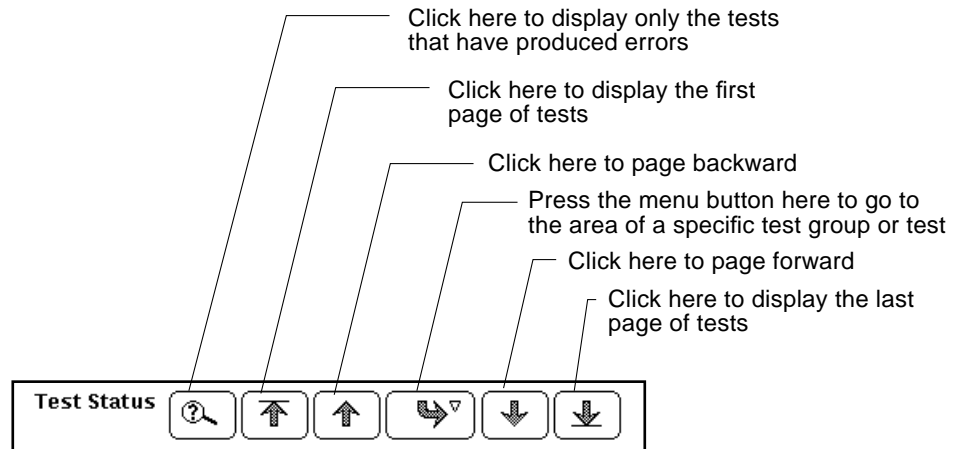


Figure 3-12 OPEN LOOK Test Status Icons

Figure 3-13 shows how to quickly go to a specific test or test group by selecting the curved arrow icon and dragging right to display the pop-up menu.

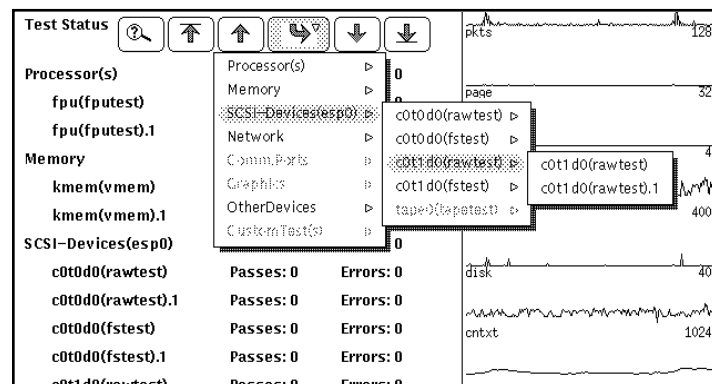


Figure 3-13 OPEN LOOK Test Status Icon Menu

OPEN LOOK Performance Meter

The Performance Meter panel (see Figure 3-14) shows a graphic display of the test system's performance statistics. This panel provides the same statistics the `perfmeter` utility.

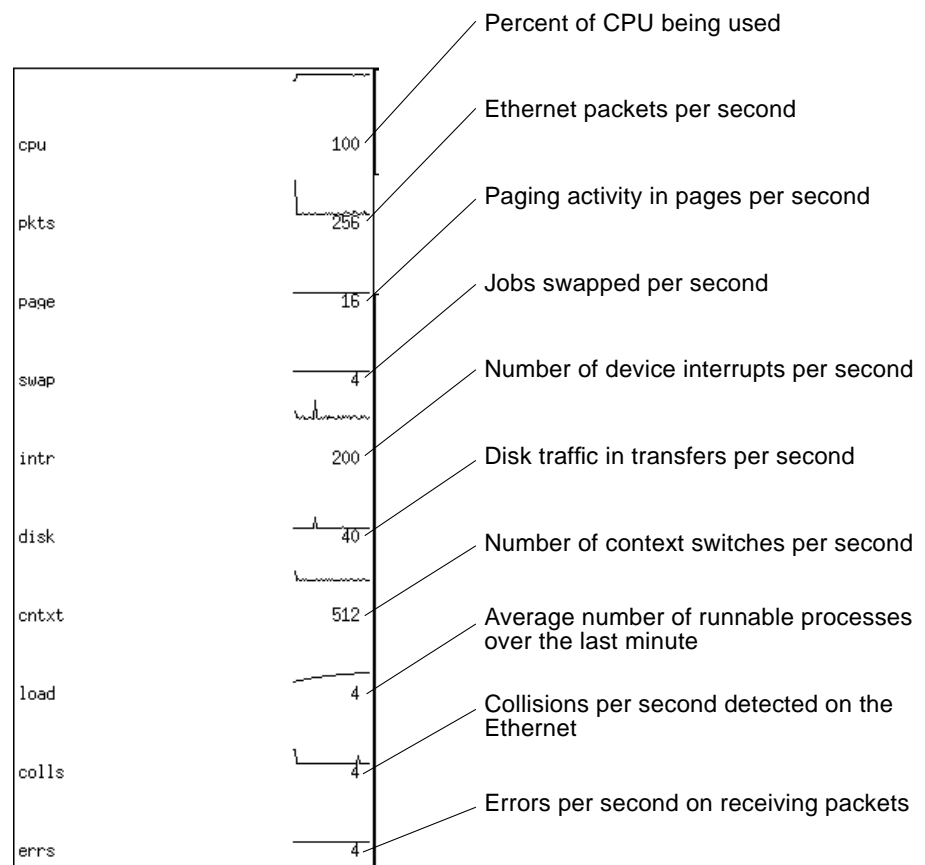


Figure 3-14 OPEN LOOK Performance Meter

OPEN LOOK Control Panel

You can control the SunVTS tests using the Control panel menus and buttons (see Figure 3-15).

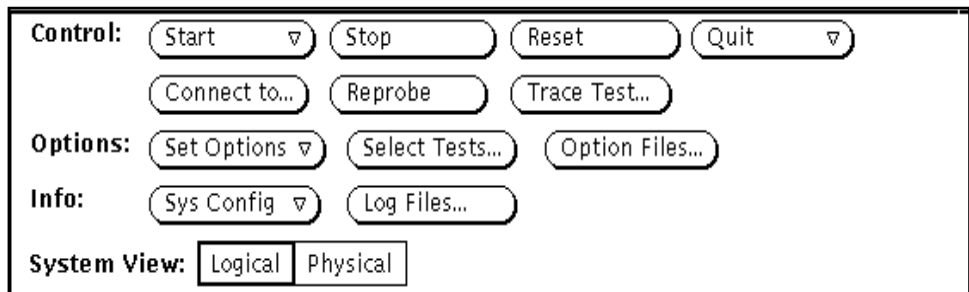


Figure 3-15 OPEN LOOK Control Panel

The following table shows the page number for information about each of the Control Panel selections.

Table 3-1 OPEN LOOK Control Panel

Selection	Button	Description	Page
Control	Start	Starts all enabled tests	page 47
	Stop	Stops all tests	page 48
	Reset	Resets all pass and error counts	page 48
	Quit	Terminates the SunVTS User Interface and/or the SunVTS kernel	page 49
	Connect to	Connects to another machine	page 50
	Reprobe	Reprobes the system	page 51
	Trace Test	Creates a log of every system call	page 51

Table 3-1 OPEN LOOK Control Panel

Selection	Button	Description	Page
Options	Set Options	Sets the global SunVTS kernel and test options	<i>page 54</i>
	Select Tests	Sets global test options	<i>page 58</i>
	Option Files	Saves the current settings from the global test options and specific test settings	<i>page 59</i>
Info	Sys Config	Displays and/or prints the system's configuration information	<i>page 60</i>
	Log Files	Displays the Log Files Window	<i>page 62</i>
System View		Determines whether the view is Logical or Physical	<i>page 63</i>

Control Selections

Use the Control Selection area of the Main window to set up the testing environment.

Start Button

From the Start button you can:

- Start all enabled tests
- Start all enabled tests with Record on
- Replay the previous test session

When testing begins, the Start button dims and the System Status changes from idle to testing. The Test Status panel also starts displaying the status for all active tests (see “CDE System Status Window” in this chapter).

If Start with Record is selected, the sequence of events that the SunVTS kernel goes through will be recorded. This lets you duplicate the same sequence of events again by selecting Replay the next time testing begins. This is helpful when trying to duplicate an error condition that is dependent upon the SunVTS kernel's sequence of events during testing. (See “Option Files Button” in this chapter for additional information.)

Stop Button

Click the Stop button to halt all active tests. The test results remain on the Test Status panel after testing is completed.

Note – Click the Stop button only once. Some tests do not stop immediately, so the System Status may take time to change from stopping to idle.



Caution – If you click the Stop button when a test is hung, the user interface appears frozen. You can force the interface to ignore the hung tests by deselecting these tests from the Test Option panel.

Reset Button

The Reset button (see Figure 3-16) resets the pass and error counts to zero for each test in the Test Status panel. It also resets the system passes, total errors, and elapsed time to zero. This button only works when all testing has stopped.

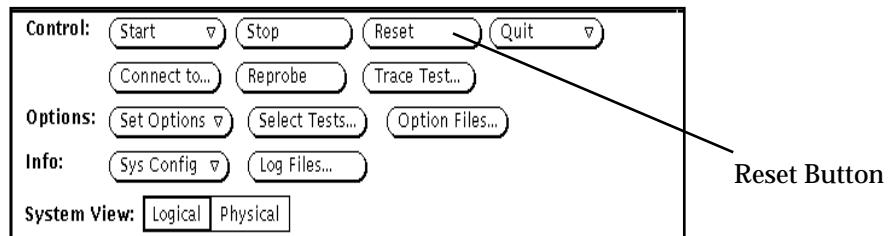


Figure 3-16 OPEN LOOK Reset Button

Once testing has begun, the Reset button changes to Suspend. Click the Suspend button to change this button to Resume and pause all SunVTS tests. To resume testing, click the Resume button (see Figure 3-17).

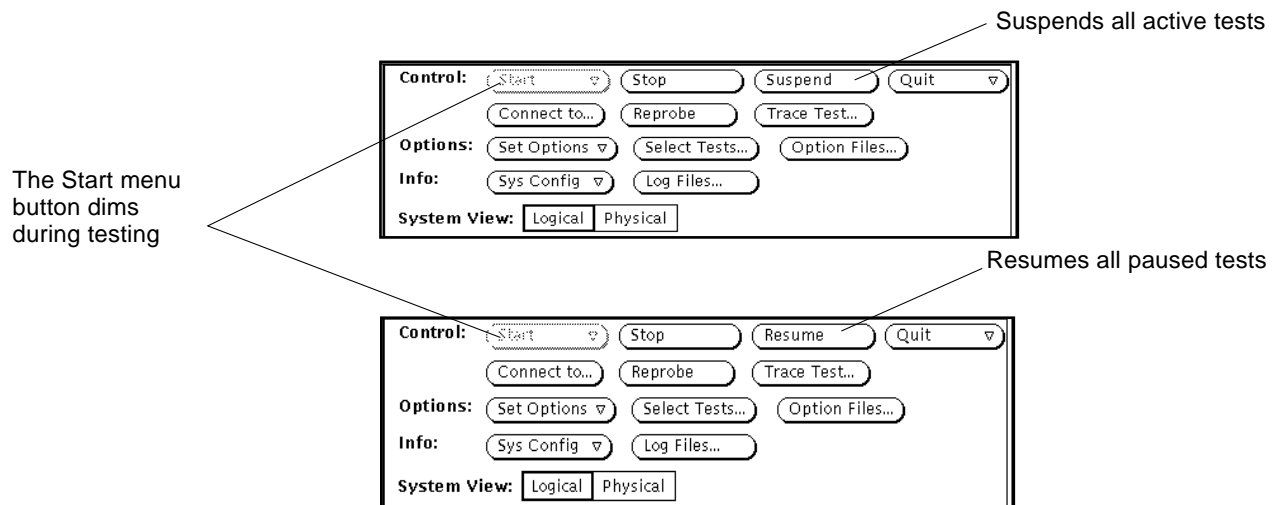


Figure 3-17 OPEN LOOK Suspend/Resume Button

Quit Button

From the Quit menu button, you can terminate SunVTS for:

- Both the user interface and the SunVTS kernel
- Only the SunVTS kernel on the test system
- The user interface

Terminating only the SunVTS kernel is helpful if you want to restart the kernel from the command line, or if you want to connect to another machine on the network.

If you select Terminate Kernel Only, the SunVTS user interface displays the following pop-up message (see Figure 3-18).



Figure 3-18 OPEN LOOK Terminate Kernel Only Window

This tells you that the connection to this machine has been broken. The beginning of the message shows the machine host name (in parentheses) where the SunVTS kernel terminated.

Connect to Button

Use this feature to connect to another machine.

- ◆ **Click the Connect to button to display the Connect to Machine window**

From this window (see Figure 3-19) you can connect the user interface to another machine on the network that is running the SunVTS kernel.

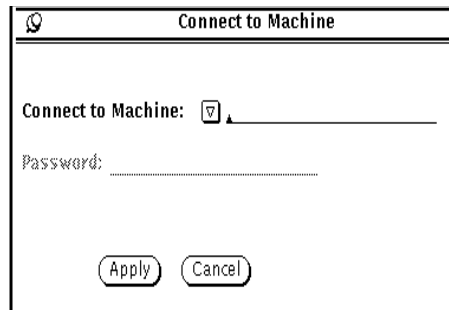


Figure 3-19 OPEN LOOK Session Connection Window

- ◆ **Type the hostname of the machine you want to connect to and click the Apply button.**

Usually, you don't need a password to connect to another machine, in which case the password field is grayed-out.

In the case of a machine being setup to have security restrictions that require a password, the password field will appear fully after you press Apply. You can then type in the password and press Apply again to make the connection.

Once you are connected to the SunVTS kernel on the test machine, you can view and control that system's testing status.

After you successfully connect to another system, you can use the Connect to Machine abbreviated pull-down menu button to display and select other machines.

Reprobe Button

- ◆ Click the **Reprobe** button to force the SunVTS kernel to reprobe the hardware devices on the test system (see Figure 3-20).

For example, if you forgot to insert a blank tape into a tape drive before you started the SunVTS kernel, you may need to reprobe the system. By reprobing the system, you can use the `tapetest` command to test the tape drive.

Note – When you click the Reprobe button, a pop-up window displays so you can confirm your selections.

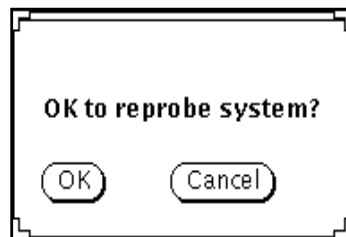


Figure 3-20 OPEN LOOK Reprobe Confirmation Pop-Up

If you add SCSI devices to your test system, you need to perform a reconfiguration boot on the system so these devices can be probed by the SunVTS kernel. See the section “Adding and Removing Devices” in Chapter 2 for more information.

Trace Test Button

Use the System Call Tracing to create a log of every system call made when a test is running. This feature logs the system calls using the standard UNIX command `truss`. The trace messages logged by this feature give you a powerful debugging tool when isolating the specific cause of an error. (See the `truss(1)` man page for more information.)

From the Trace Test window (see Figure 3-21) you can choose one or more tests to be traced by selecting the test name from within the scrolling list. You can only select test names; you cannot select test group names. Once a test is selected, system call tracing is immediately enabled. Therefore, if the test is already running when you select it for tracing, it will begin being traced immediately.

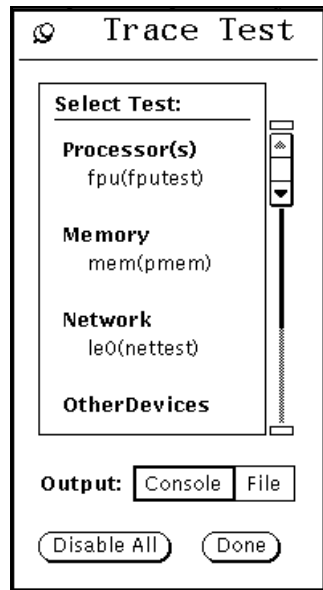


Figure 3-21 OPEN LOOK Trace Test Window

When a test is selected, the test name is highlighted in the list. In addition, a capital letter “T” appears next to the test name in the SunVTS Status panel (see Figure 3-22). This “T” lets you see which tests are being traced.

Test Status		
Processor(s)	Passes: 0	Errors: 0
T fpu(fputest)	Passes: 0	Errors: 0
fpu(fputest).1	Passes: 0	Errors: 0
Memory	Passes: 0	Errors: 0
T kmem(vmem)	Passes: 0	Errors: 0
kmem(vmem).1	Passes: 0	Errors: 0
T mem(pmem)	Passes: 0	Errors: 0
mem(pmem).1	Passes: 0	Errors: 0
SCSI-Devices(esp0)	Passes: 0	Errors: 0

Figure 3-22 OPEN LOOK Selected Trace Tests on Test Status Panel

To deselect a test, click the highlighted test name in the list displayed by the Trace Test window (see Figure 3-21). When a test is deselected, system call tracing stops immediately. However, several trace messages may continue to be displayed until the message buffer has been emptied.

You can send the trace messages to either the SunVTS Console window, or to a log file in `/var/opt/SUNWvts/logs`. Click either the Console or File selection respectively at the Output selection switch in the Trace Test window. The system call trace messages are immediately redirected.

Note – Although multiple tests can be selected, each traced test degrades system performance due to the large overhead involved when tracing a process. Consequently, no more than three tests should be selected at a time. Be aware that if you decide to send the messages to `sunvts.trace` log file, the log file size grows rapidly (approximately 1 Mbyte for each minute and a half of run time).

Options Selections

This area of the Main window is where you set global options for each group of tests.

Set Options Button

From the Set Options window, you can set the global SunVTS kernel and test options. See Figure 3-23 for an overview of the various options available on SunVTS.

- 1. Click the Set Options button to display the SunVTS Options window.**
- 2. Select and change the options (see Table 3-2 for a complete list and description of each available option), and click the Apply button.**

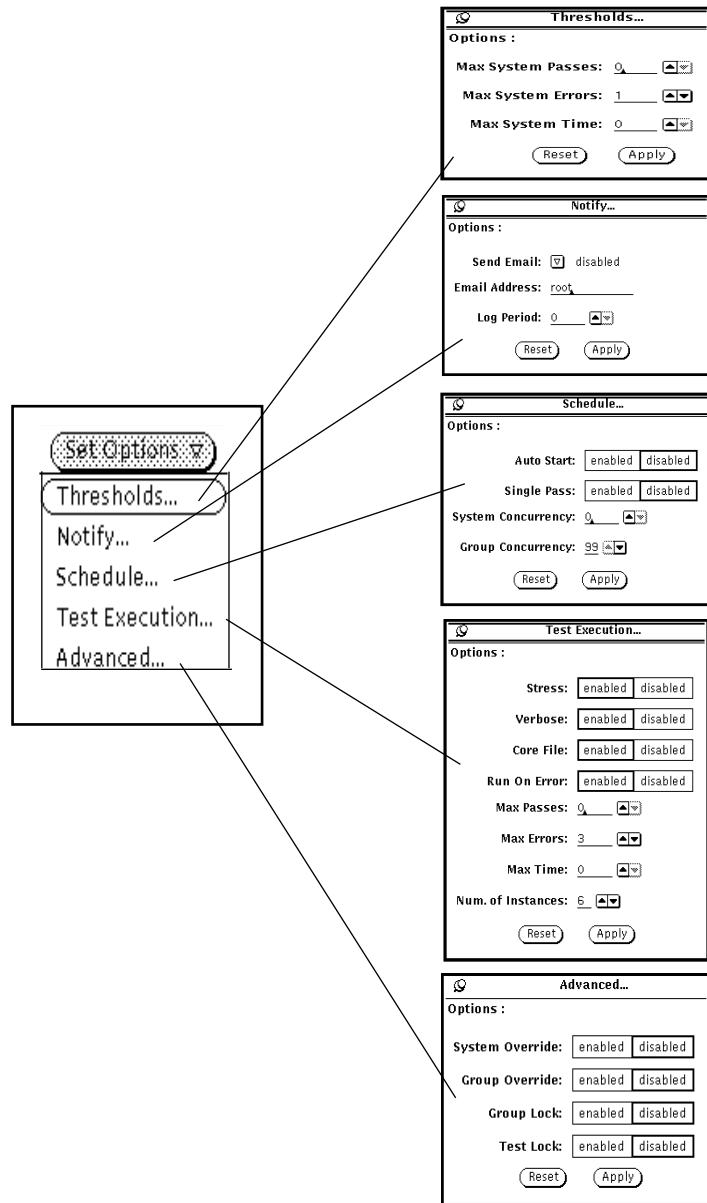


Figure 3-23 OPEN LOOK Options Windows

Table 3-2 OPEN LOOK Global Options

Global Options	System Option	Description
Thresholds...	Max System Passes	States the maximum number of system passes before stopping all tests (0 causes the SunVTS kernel to run the tests until you click the Stop button)
	Max System Errors	States the maximum number of system errors before SunVTS stops all tests (0 causes the SunVTS kernel to continue testing regardless of errors)
	Max System Time	Specifies the maximum number of minutes that SunVTS continues testing (0 makes the SunVTS kernel run the selected tests until you click the Stop button)
Notify...	Send Email	Determines when and if you want the test status messages sent to you through email. From this menu, you can choose: <ul style="list-style-type: none"> - Disabled (never send mail) - Now (send mail immediately) - On Error (send mail when an error occurs) - Periodically (send mail with a time period set in the Log Period option) - On Error & Periodically (send mail periodically as well as when an error occurs)
	Email Address	Indicates the email address where the test status messages are sent (the address is root by default)
	Log Period	Specifies, in minutes, the time between sending test status email messages
Schedule...	Auto Start	Eliminates the need to use the Start button to start a SunVTS testing session. To use this option: <ol style="list-style-type: none"> (1) Enable the Auto Start setting. (2) Save the System options and Test options to an option file (see "Option Files Button" in this chapter for more information). (3) Starts SunVTS from the command line, specifying the option file. SunVTS begins testing soon after the main window is displayed.
	Single Pass	Runs only one pass of each selected test
	System Concurrency	Sets the maximum number of test instances that can be run concurrently in the machine being tested

Table 3-2 OPEN LOOK Global Options (Continued)

Global Options	System Option	Description
Test Execution...	Group Concurrency	Sets the number of tests you want to run at the same time in the same group
	Stress	The amount of stress can be tuned by the number of test instances you select
	Verbose	Displays verbose messages in the SunVTS Console window
	Core File	Creates a core file. If the <SunVTS bin> directory is writable; core.<testname>.xxxxxx is the Core File name, where <testname> is the test that dumped core, and where xxxxxx is a character string generated by the system in order to make the file name unique. When Core File is disabled, a message indicating the signal that caused the failure is displayed and logged. See “Log Files Button” in this chapter for more information
	Run On Error	Continues testing until the Max Errors number is reached
	Max Passes	Specifies the maximum number of passes a test can run
	Max Errors	States the maximum number of errors a test allows before stopping (0 makes the SunVTS kernel continue testing regardless of errors)
	Max Time	States, in minutes, the time limit a test can run (0 = no limit)
	Number of Instances	Specifies the number of instances to run each scalable test
	Advanced...	System Override
Group Override		Supersedes the specific test options in favor of the group options in this window

Table 3-2 OPEN LOOK Global Options (Continued)

Global Options	System Option	Description
	Group Lock	Protects the specific group options from being changed in this window from the options set at the system level (the System Override option supersedes this option)
	Test Lock	Protects the specific test options from being changed in this window from options set at the group or system level (the System Override and Group Override options supersede this option)
	Processor Affinity	Only available on multiprocessor systems: lets you specify on which processor you want to run all tests. To select the specific processor, click the number. If no processor is specified, the operating system randomly distributes testing among all the processors. Note, that when you use random distribution, you cannot verify that all processors have been tested.

Select Tests Button

From the Select Tests Window, you can set the global testing options (see Figure 3-24).

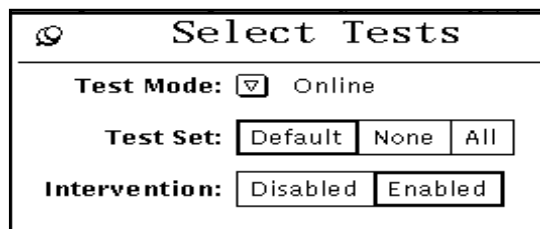


Figure 3-24 OPEN LOOK Select Tests Window

- ◆ **Select Test Mode to choose Online or Offline mode for testing.**
- ◆ **Select Test Set for a quick way to select groups of tests**
 - Default enables the default group of tests.
 - None enables none of the individual tests
 - All selects all of the tests

Note – Selecting None while tests are running stops the tests, but the System Status panel still displays the word testing, and the Elapsed Time continues to increment. Click the Stop button to halt testing.

♦ **Select Intervention to enable or disable tests that require you to intervene before or while a test is running.**

There are two categories of tests that require intervention mode:

- Tests of drives that require scratch media (tapes, discs, or diskettes)
- Tests that require loopback connectors

SunVTS cannot run these tests until you enable intervention mode. This setting does not change the test function; it just serves as a reminder that you must intervene before the test can be successfully completed.

Option Files Button

Storing an Option file saves the current settings from the global test options and specific test settings to a file in the `/var/opt/SUNWvts/options` directory (see Figure 3-25).

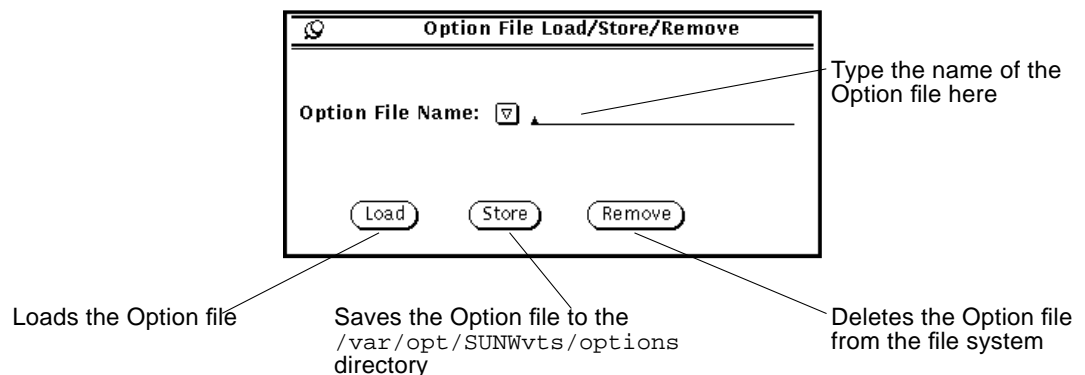


Figure 3-25 OPEN LOOK Option File Window

Please refer to “Option Files” in Chapter 4 for more details.

Info Selections

This area on the Main window lets you select various ways to view system information.

Sys Config Button

From the Sys Config menu, you can:

- Display test system configuration information
- Print test system configuration information

▼ To Display the Hardware Configuration of the Test System

1. Select Display from the Sys Config menu.

The Configuration window appears (see Figure 3-26) listing all of the hardware on the test system and their corresponding hardware tests.

```

skorpios: system configuration

session id= 01 2518 1342177280 1 0 0 192.9.132.19 3

Processor(s)
  fpu(fputest)
    Architecture: sparc
    Type: TI TMS390Z50 SuperSPARC chip
    CPU(0/A): Frequency=40Mz
    CPU(0/B): Frequency=40Mz
    CPU(1/A): Frequency=40Mz
    CPU(1/B): Frequency=40Mz
  mp(mptest)
    # of processors : 4
  system(systemst)
    System Configuration: sun4d SPARCserver 1000
    System clock Frequency: 40 MHz
    Number of XDBuses: 1

Memory
  kmem(vmem)
    Amount: 141840KB
  mem(pmem)
    Physical Memory size: 96Mb
    group=0/0 size= 32MB
    group=0/1 size= 0MB
    group=0/2 size= 0MB
    group=0/3 size= 0MB
    group=1/0 size= 32MB
    group=1/1 size= 32MB
    group=1/2 size= 0MB
    group=1/3 size= 0MB

SCSI-Devices(esp0)
  c0t0d0(rawtest)
    Logical Name: c0t0d0
    Capacity: 510.23MB
    Controller: esp0
  c0t1d0(rawtest)
    Logical Name: c0t1d0
    Capacity: 510.23MB
    Controller: esp0

```

Figure 3-26 OPEN LOOK Typical System Configuration Window

▼ To Print the Hardware Configuration of the Test System to a Local Printer

1. Select the Print option from the Sys Config pull-down menu.
A Print Configuration window displays (see Figure 3-27).

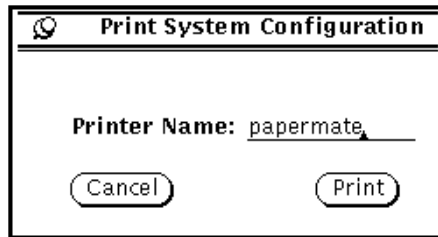


Figure 3-27 OPEN LOOK Sample Print System Configuration

2. Type the name of your printer in the Printer Name field.
3. Click the Print button.

Log Files Button

SunVTS saves the status of its progress in three log files. These files contain error, information, and UNIX messages. You can access these files from the Log Files Window, which is displayed when you click the Log Files button (see Figure 3-28).

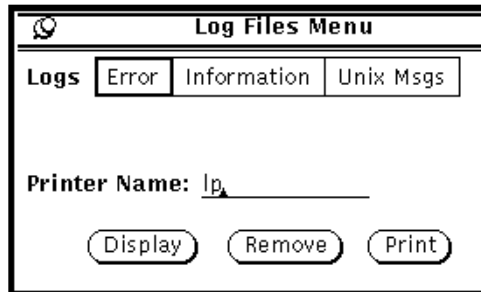


Figure 3-28 OPEN LOOK Log Files Menu

The three log files in this menu are:

- `/var/opt/SUNWvts/logs/sunvts.err` (SunVTS Error Status Log)
- `/var/opt/SUNWvts/logs/sunvts.info` (SunVTS Information Log)
- `/var/adm/messages` (Solaris System Message Log)

Please refer to “Reviewing Log Files” in Chapter 4 for more details.

System View Selections

This selection gives you a choice of displaying either the Logical or Physical view of the system being tested (see Figure 3-29).

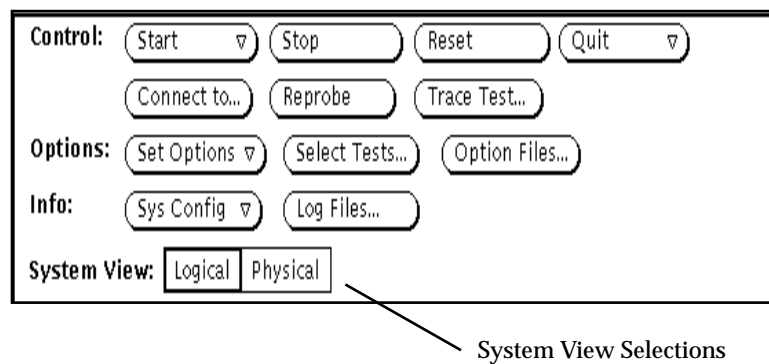


Figure 3-29 OPEN LOOK System View Selections

OPEN LOOK Test Selection Panel

From the Test Selection Panel, you can select and deselect the tests you want to run. You can also change global and individual test options (see Figure 3-30).

Note – The content of this panel is determined by the test configuration.

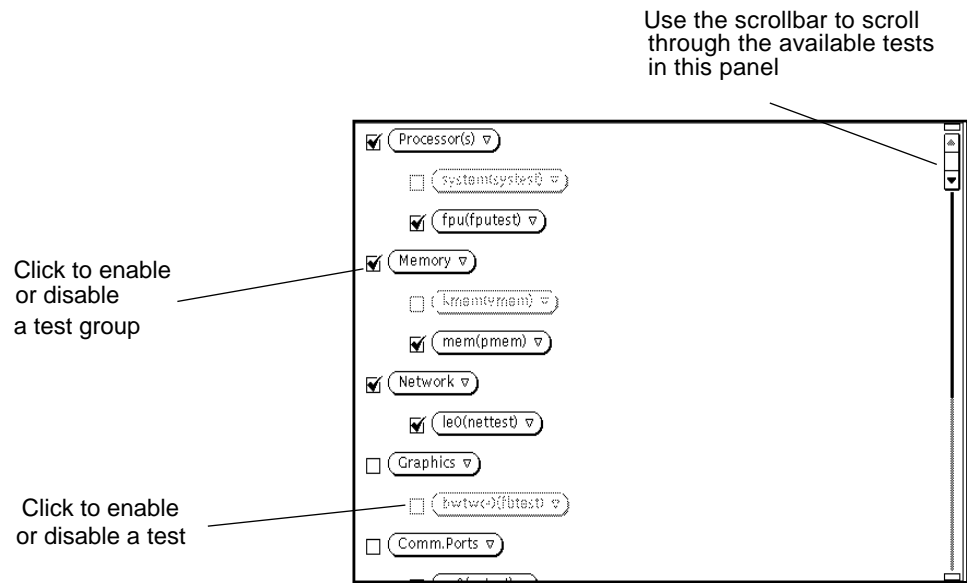


Figure 3-30 OPEN LOOK Test Selection Panel

Note – Some tests can only be selected if you are running SunVTS in Intervention mode. See “Intervention” in Chapter 4 for more information.

If you click a test *group* (Processor(s), Memory, Network, and so on), the test group’s system option window displays and gives you three options for viewing and setting test group options:

- Scheduling
- Test Execution
- Advanced

See Table 3-2 for descriptions of these options.

If you click an *individual* test (pmem0(pmem), cpu-unit(fptest), and so on), the test system option window displays and gives you three options for viewing and setting individual test options:

- Test Options
- Test Execution Options
- Test Advance Options

Each of these windows are test dependent and are described in the *SunVTS 2.0 Test Reference Manual*.

OPEN LOOK Console Panel

SunVTS error messages are displayed in the Console panel, located in the lower right portion of the SunVTS OPEN LOOK Main window (see Figure 3-31).

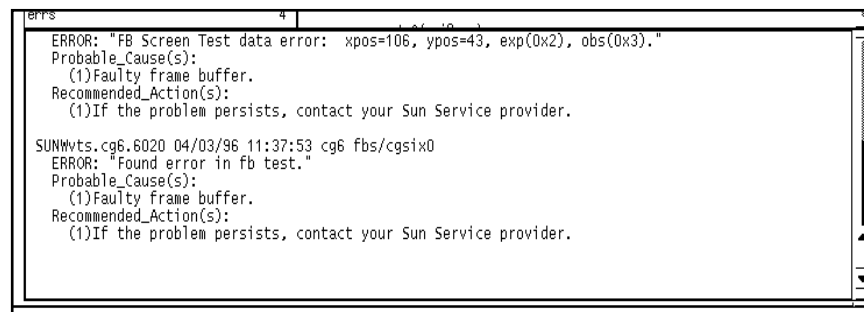


Figure 3-31 OPEN LOOK Console Panel

- ◆ **To display verbose messages from either the SunVTS kernel or the tests, enable the Verbose option on the Set Options window in the Test Execution selection.**

See "Option Files Button" in this chapter for more information about setting up Option files.

TTY Interface

A screen-oriented TTY-based interface is an option with SunVTS. You can use it in a command shell from a telnet, rlogin, or tip session, or from a terminal attached to a serial port or connected to the system being tested through a modem. Most of the control and monitoring options available through the GUI are available through the TTY interface also.

TTY Main Window

The TTY Main window is divided into four main areas (see Figure 3-32):

- Control panel
- Status panel
- Tests panel
- Console area

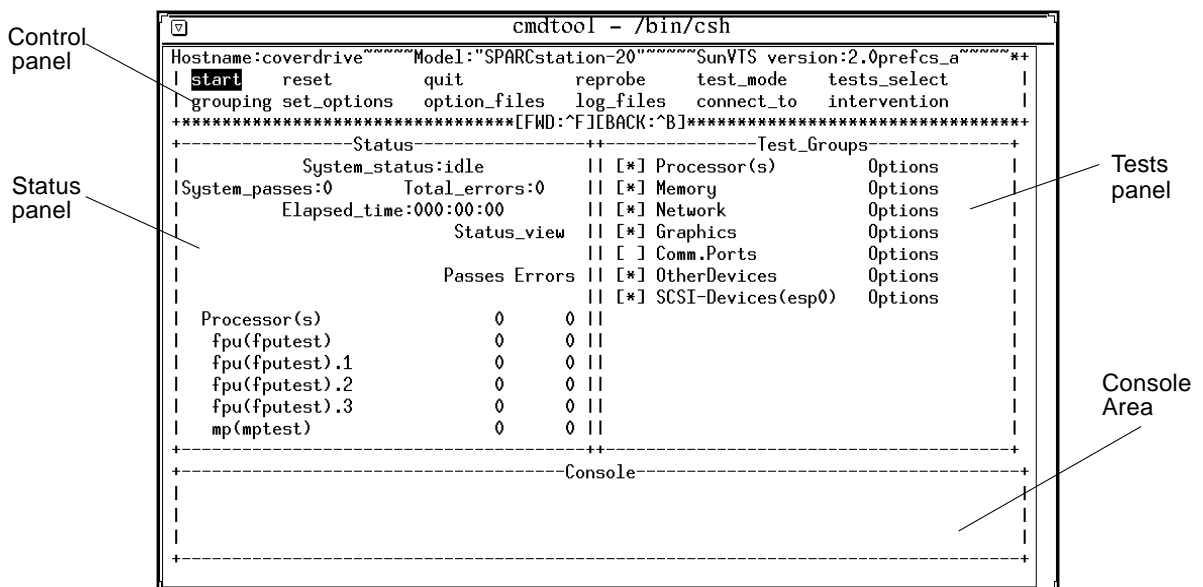


Figure 3-32 TTY Main Window

Navigating Through TTY

Throughout the TTY interface, there are common keyboard commands used to navigate through the interface. Table 3-3 summarizes these commands.

Table 3-3 TTY Keyboard Commands

Key	Description of Action
Tab	Shifts focus to another window. For example, if you are working in the Control panel and hit the Tab key, you will shift the focus (or highlight) the Status panel. A highlighted panel will be bordered by asterisks (*). You must first highlight a panel before you can change an option in that panel
Return	Depends on the context: <ul style="list-style-type: none">- Displays a menu, or- Selects and applies a choice or a command in a menu
Spacebar	Selects or deselects an option checkbox; select is represented by open double brackets [] and deselect is represented by an asterisk within double brackets [*]
Arrow Keys	Moves between options in a highlighted panel
Backspace Key	Deletes text in a text field
Escape	Discards a pop-up menu or window
Control-F	Scrolls forward in a scrollable window
Control-B	Scrolls backward in a scrollable window
Control-X	Quits the TTY user interface, but leaves the SunVTS kernel running
Control-L	Refreshes the TTY window

The following sections lead you through some common testing procedures. In all cases, use these keyboard commands to select and apply your test options.

Selecting Tests and Test Groups for Testing in TTY

▼ To Select and Deselect Tests and Test Groups

1. **Press the Tab key until the Tests panel is selected.**
When selected, the panel is bordered by asterisks.
2. **Use the arrow keys to highlight the checkbox by the test group name.**
In this example (see Figure 3-36) the checkbox associated with SCSI-Devices (esp0) group is selected, so it is highlighted.
3. **Press the Spacebar to deselect the test group.**
Notice that the asterisk is no longer between the brackets, and the test names are removed from the Status panel.

```

cmdtool - /bin/csh
-----
| start  reset      quit      reprobe  test_mode tests_select
| grouping set_options option_files log_files connect_to intervention
-----
+-----Status-----+*****Test_Groups*****+
| System_status:idle  || [*] Processor(s)  Options
| System_passes:0    Total_errors:0 || [*] Memory        Options
| Elapsed_time:000:00:00 || [*] Network       Options
|                               Status_view || [*] Graphics      Options
|                               Passes Errors || [ ] Comm.Ports    Options
|                               || [*] OtherDevices  Options
| sound0(audio)      0      0 || [*] SCSI-Devices(esp0) Options
|                               ||                   ||
|                               ||                   ||
+-----+*****+
+-----Console-----+

```

Figure 3-36 Deselecting a Test Group in TTY

4. **Use the right arrow key to highlight the test group name.**
5. **Press the Return key to display the tests within the test group.**

Using the TTY Status_view Menu

Because of the small size of the Status panel, often more tests are selected than can be shown on the panel. Use Control-F and Control-B keys to scroll forward and backward respectively. You can also use the Status_View menu to scroll through the pages and also to display only those tests that have errors.

▼ To Scroll Through Tests Using the Status_view Menu

1. Press the Tab key until the Status panel is highlighted.

When selected, the panel has asterisks around the border. Notice that the Status_view option is also highlighted.

2. Press the Return key to display the Status_view menu (see Figure 3-38).

```

cmdtool - /bin/csh
-----+-----
| Hostname:coverdrive~~~~~Model:"SPARCstation-20"~~~~~SunVTS version:2.0prefcs_a~~~~~+
| start reset quit reprobe test_mode tests_select |
| grouping set_options option_files log_files connect_to intervention |
+-----+-----+
+-----+-----+
| Status+-----+-----+ Test_Groups |
| System_status:idl+****Status_view****+cessor(s) Options |
| System_passes:0 Total_el Errors_only lory Options |
| Elapsed_time:000:00| Next_page(^F) lwork Options | |
| | St| Previous_page(^P) lphics Options |
| | | First_page lm.Ports Options |
| | Pas| Last_page lerDevices Options |
| | | I-Devices(esp0) Options |
+-----+-----+
| Processor(s) +****[DONE:ESC]****+ |
| fpu(fputest) 0 0 || |
| fpu(fputest).1 0 0 || |
| fpu(fputest).2 0 0 || |
| fpu(fputest).3 0 0 || |
| mp(mptest) 0 0 || |
+-----+-----+
+-----+-----+
| Console |
+-----+-----+

```

Figure 3-38 TTY Status_view Menu

3. Use the up and down arrow keys to select the option you want.

Choose one of the following options:

Table 3-4 Status_view Menu Options

Option	Description
Errors_only	Displays only the tests that produce errors
Next_page	Skips to the next page of tests
Previous_page	Goes back to the previous page of tests
First_page	Goes to the first page of tests
Last_page	Goes to the last page of tests

4. Press the Return key to select your choice.

The Status panel changes to reflect your choice.

Using the TTY log_files Menu

▼ To Display, Print, or Remove log_files

1. Press the Tab key until the Control panel is highlighted.

When selected, the panel has asterisks around the border (see Figure 3-39).

2. Use the arrow keys to highlight the log_files option.

3. Press the Return key to display the log_files menu.

4. Use the Up and Down arrow keys to select the option you want.

Choose one of the following options:

Table 3-5 TTY log_files Menu Options

Option	Description
Error	Selects the Error log file
Information	Selects the Information log file
Unix Msgs	Selects the UNIX messages log file


```

cmdtool - /bin/csh
$SUNWvts.nettest.6002 02/21/96 14:15:38 nettest.2 hme0 ERROR: "No ICMP echo reply from
gyver 192.9.132.32." Probable_Cause(s): <system load too heavy> <No cable connection
> <target machine too busy> Recommended_Actions: <reduce system load or increase time
out time> <Check cable connection!> <reduce target machine load>

000.00.999.9012 02/21/96 14:15:39 plsrdiag SunVTS ERROR: *Failed test*
hme0(nettest).2          passes: 46   errors: 1
SUNWvts.audio.8027 02/26/96 23:06:12 audio sound/0 FATAL: "play: `ioctl(filides=0x4, A
UDIO_DRAIN=0x20004103, NULL=0x0)` system call timeout. No response after 50 seconds.
Device = /dev/sound/0" Probable_Cause(s): <Audio hardware (usually consistent failu
res)> <System software problem (usually intermittent failures)>

000.00.999.9012 02/26/96 23:06:13 plsrdiag SunVTS ERROR: *Failed test*
sound0(audio)           passes: 13434 errors: 1
SUNWvts.audio.8027 02/27/96 10:59:26 audio sound/0 FATAL: "play: `ioctl(filides=0x4, A
UDIO_DRAIN=0x20004103, NULL=0x0)` system call timeout. No response after 50 seconds.
Device = /dev/sound/0" Probable_Cause(s): <Audio hardware (usually consistent failu
res)> <System software problem (usually intermittent failures)>

000.00.999.9012 02/27/96 10:59:27 plsrdiag SunVTS ERROR: *Failed test*
sound0(audio)           passes: 14628 errors: 2
@
@
"/tmp/sunvts_log" [Read only] 16 lines, 1720 characters

```

Figure 3-40 TTY log_file

7. Type :q to return to the main window.

Note – If you try to run a graphics test on a test machine that is not running OPEN LOOK, and you are running the SunVTS TTY interface on the test machine monitor, the graphics test may fail. You can avoid this failure by either running the SunVTS TTY interface on a terminal attached to a serial port on the test machine, or you can run the TTY interface from a remote machine.

SunVTS Testing Environment



This chapter describes a SunVTS testing environment. The examples in this chapter use the OPEN LOOK user interface.

System Mapping

System mapping provides a consistent view of the system configuration, depending on the user's requirements. The SunVTS probe only displays the devices for which tests are present. Devices that are not testable, or for which there is currently no SunVTS test, are not displayed.

There are two types of system mapping:

- Physical - shows the exact location of the device on the system for Field Replaceable Unit (FRU) identification. From the physical mapping, you can determine the actual location of the device(s). When possible, the board number and controller type for the device are also displayed.
- Logical - organizes devices being probed according to the functional device type, such as disks, graphics, and so forth. The Logical map is determined by the individual device probes. From the Logical view, you can view the system as being made up of one or more logical device groups. You can focus on a specific group or on all of the groups found on the system.

When you select either the physical or logical button from the user interface, the system mapping displays.

Note – This feature is available only on the following server systems: SS1000, SS2000, Ultra Enterprise 6000, Ultra Enterprise 4000, and Ultra Enterprise 3000.

Test Selection

The Test Selection panel lets you selectively enable the tests you want to run during the testing session.

Choosing Tests in the Test Selection Panel

When you start SunVTS, the SunVTS kernel probes the test system devices. The results of this probe are displayed on the Test Selection panel. There is an associated SunVTS test for most hardware devices on your system.

Test Modes

Three modes of testing are available: *Offline*, *Online*, and *Connectivity*. These modes differ from each other in their assumptions about the state of the system being tested and its objectives.

To indicate the level of system usage, a distinction is made between *Offline* and *Online* system states.

Connectivity Mode

In this mode, the tests determine if the devices are connected to the system being tested and are accessible. Functional testing is not done in this mode, but the device is accessed to establish system connection and accessibility.

Tests can safely be run in this mode when the system is online (see “*Online Mode*” for assumptions regarding the *Online* system state). As in the case of *Online* mode, some system and test options are fixed. When SunVTS testing is started in this mode, each test is run sequentially until all tests are run.

The limited nature of the tests in this mode makes it possible to run periodic checks for configuration verification on the system.

Online Mode

Online mode does functional testing to find and isolate faults, while minimizing the impact on other applications and users.

In Online mode the system is running critical production software. The tests are sensitive to this fact and usually try to achieve as much coverage as possible within the constraints imposed. In this mode, some of the test parameters, execution options, and some system level options are fixed (have preassigned values) that cannot be changed. This ensures that the system state is not violated by the user selecting an option or combination of options, which could trigger unsafe actions when SunVTS is run in Online mode.

Offline Mode

Offline mode thoroughly tests the functionality of the system devices. This finds any faults and exercises the system by running tests to increase the load and stress on the system.

During Offline mode, do not run critical applications on the system or use the system for production purposes.

Note – Solaris is required to be running. However, the system should not be running critical production software.

In Offline mode, tests expect all system resources that are associated with the device to be available for testing. If the test cannot access a device, it registers a failure. The tests do not economize on runtime, but focus on achieving complete coverage and thoroughly exercising the device.

Note – It is the responsibility of the system administrator (or whoever is running SunVTS) to ensure that the state of the system conforms to assumptions made regarding it before running the tests in the Offline mode. SunVTS does not verify that the system is offline or that the assumption made above is true; it does not stop other applications or log out other users.

Table 4-1 shows the default values of the test execution options in different modes.

Table 4-1 Test Execution Options

Option	Offline	Online	Connectivity
Stress	disabled	disabled (fixed)	disabled (fixed)
Verbose	disabled	disabled (fixed)	disabled (fixed)
Core File	disabled	disabled (fixed)	disabled (fixed)
Run On Error	disabled	disabled (fixed)	disabled (fixed)
Max Passes	0	1 (fixed)	1 (fixed)
Max Time	0	0 (fixed)	0 (fixed)
Number of Instances	depends on the number of processors	1 (fixed)	1 (fixed)

Intervention

Certain tests, like the serial port test (`sptest`), require that you intervene *before* running the test. Attach a loopback connector before running the serial port test. Other tests, like the tape drive test (`tapetest`), require that you insert scratch media into the device.

After selecting Enable on the Intervention switch, you can select all the tests (see “Test Set” and “Selecting Test Groups and Individual Tests” in this chapter). This switch serves as a reminder that you may need to intervene before running certain tests; it does not change the test.

Test Set

The Test Set switch lets you select test states. When you start SunVTS, a default set of tests appears on the Test Selection panel. This default selection of tests provides you with a set amount of coverage during the testing session.

You can select or deselect other tests besides the default test set. If you select a different group of tests, you can return to the default test selection by choosing the Default selection on the Tests switch.

If you enable Intervention, you can select all of the tests available by choosing All on the Test Set switch.

To deselect all of the tests, choose None on the switch. You can deselect all the tests with None. This selection comes in handy when you only want to run a single test. You can first deselect all the tests and then select the single test you want to run.

Selecting Test Groups and Individual Tests

You can select entire test groups or individual tests from the Tests Selection panel. There are check boxes in front of each test and test group (Figure 4-1). By clicking on the test group box, you can select or deselect all the tests in that group. Also, by clicking on a test box, you can select or deselect that one test.

Selecting only the tests you want to run fine-tunes your testing session.

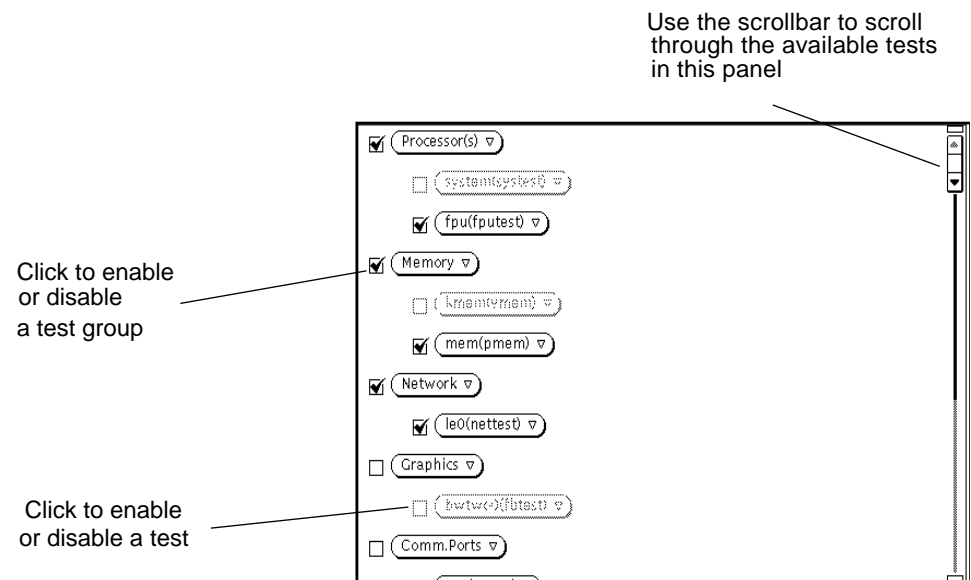


Figure 4-1 Selecting and Deselecting Tests

Test Execution Options

SunVTS lets you customize your SunVTS environment by setting option variables. There are two types of options:

- System options - affect the overall SunVTS environment, such as determining when to stop testing, whether verbose messages from a test are displayed, and so on.
- Test specific options - are the set of options that each test can have, and pertain to that test only. For example, the amount of media to test in a disk test, the amount of memory to test in memory test, the remote host address in a net test, and so on.

Table 4-2 System Options

System Option	Description
Stress	Performs stress testing
Core File	Creates a Core file. If the <code><SunVTS bin></code> directory is writable then <code>core.<testname>.xxxxxx</code> is the Core file name, where <code><testname></code> is the test that dumped core, and where <code>xxxxxx</code> is a character string generated by the system to make the file name unique. When <code>core_file</code> is disabled, a message indicating the signal that caused the failure is displayed and logged. See “Log Files Button” in Chapter 3
Max Errors	States the maximum number of errors a test allows before stopping (0 makes the SunVTS kernel continue testing regardless of errors)
Max Passes	Specifies the maximum number of passes a test can run
Max Time	States, in minutes, the time limit a test can run (0 = no limit)
Number of Instances	Indicates the number of instances (processes) of scalable tests that can be running on the same processor
Processor Affinity	Tests can be bound to a specific processor via this option
Run On Error	Continues testing until the <code>max_errs</code> number is reached
Verbose	Displays verbose messages in the SunVTS console window

Some options in Online and Connectivity modes of testing have preassigned values that cannot be changed. This prevents changing or setting values for these options that may not be safe when the system is online (see “Test Selection” in this chapter for more information on system states and testing modes).

The set of SunVTS option variables are classified into three categories:

- Options applied at the system or root level
- Options applied at the groups level
- Options applied at the test level

For example: Max Time is applied at the system level, Group Concurrency is applied at the group level, and Verbose is applied at the individual test level.

SunVTS provides a mechanism for setting the options so tests in all the groups are affected globally. The settings can be restricted to all the tests and sub-groups in just one group, or the effect could be restricted to just one test.

When the user assigns a value to an option globally, that value applies to all the groups and tests below. Similarly, setting an option at the group level causes the value to trickle down to all the sub-groups and tests below it. This is a powerful mechanism for customizing the SunVTS testing environment. For example, the Verbose option can be disabled at the system level and enabled only for a particular group (or only a particular test) so that just the verbose messages from that particular group (or test) are displayed.

The effects of these options can be modified by using locks and overrides. The Group Lock and Test Lock can be used at the group and test levels; and the System Override and Group Override at the global and group levels.

Enabling the Group Lock prevents an option set at a higher level from affecting a specific group or test and the sub-groups and tests below it. Similarly, the Test Lock can be set to protect the option setting of a test. The overrides can be used to void the protection of locks. For example, setting System Override will nullify all the locks, and setting Group Override for a particular group will nullify all the locks below that group.

Setting Options

In the Test Option panel, you can select and deselect tests. You can also change the global options for each test group and change the specific options for each test (see Figure 4-2).

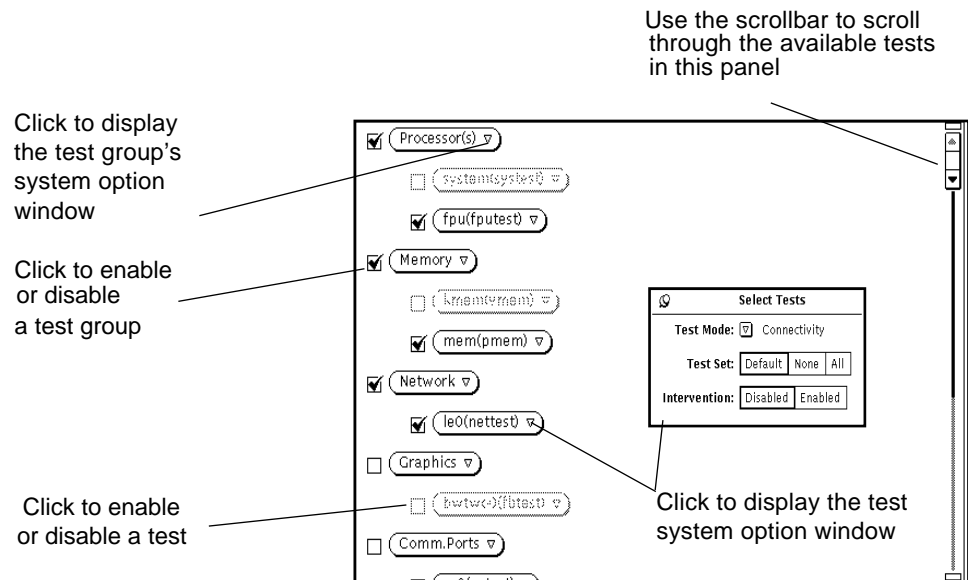


Figure 4-2 Test Option Panel

Note – The visual appearance of this panel is determined by your test system configuration.

Advanced Options

Since options generally trickle down from the system level to the tests, there are ways to prevent test or group options from being reset by global option settings. However, to do this, the Global/Group option menus have Override buttons for the locks that exist below that level. These special options can be selected from the Advanced options menu.

Scalability of Tests

The Scalability feature lets you scale the number of test instances or processes to stress single and multiprocessor systems. The scalable test's options can be modified so that each test instance can run simultaneously with a different option. Combined with the processor affinity mask, SunVTS provides a flexible testing environment. The amount of stress can be tuned by the number of test instances you select using the options described below.

- **Group Concurrency** - sets the maximum number of tests you want to run at the same time in the same group.
- **System Concurrency** - sets the maximum number of tests that can be run at the same time in the entire system; it overrides the Group Concurrency option.
- **Instances** - copies of a test that can be run simultaneously on the same device. For example, if a test has eight instances, then eight copies of that test can be run, and each copy can be run on either one or all of the processors in the system being tested (see "Processor Affinity" below). You can set the number of instances with the Number of Instances option (this option only applies to scalable tests).
- **Processor Affinity** - lets you specify the processor on which you want to run the tests; it is only available on multiprocessor systems. Each instance of the test can have a different Processor Affinity. Only one processor can be bound to an instance of the test. When no Processor Affinity is specified, migrating is the default.

Preparing for SunVTS Testing

Decide how you want to test your system before you begin testing. The SunVTS options let you fine-tune your test sessions. For example, you can choose to test only one specific piece of hardware, or you can test all of the system hardware. Similarly, you can set up SunVTS to verify the system's overall functionality, or you can set it up to stress system capabilities. Stressing the system uses more resources, and requires more testing time.

Loopback Connectors

Certain SunVTS tests require loopback plugs or cables to run successfully. Refer to the *SunVTS 2.0 Test Reference Manual* for more information about loopback connectors, and which tests need them.

Normal production programs cannot run with the loopback connectors on these devices. Be sure to remove these plugs for normal operation.

However, the loopback test is not applicable to online and connectivity modes, hence the loopback connectors are not required under these two modes.

Blank or Scratch CDs, Tapes, and Diskettes

Note – Writing to a device is not allowed in Online and Connectivity modes.

Before invoking `sunvts`, insert blank or scratch media (tape, diskette, or CD) into the drive(s), before the system is probed by the SunVTS kernel.

- For CD tests, load a blank or scratch CD into the drive.
- Tape tests require 4mm, 8mm, ½", or ¼" scratch tapes (depending on the type of drive being tested). Make sure the tape heads are properly cleaned.
- For hard disk and diskette tests, be sure there is enough space on your disk partition. Double or triple density diskettes (1.4 Mbyte) are required, depending on the diskette drive in your system.

Note – Using old or damaged tapes or diskettes may cause errors in corresponding tests.

Testing Frame Buffers

If you are running SunVTS on a frame buffer that has a graphics test running, a false error may occur. This is not a problem when you are running windows (OPEN LOOK or CDE). To activate this feature, select Enable from the option menu of the graphic test. No other graphic application can be run in the same window once you start the graphic test.

If you are running a frame buffer test from a command line, you can enable frame buffer locking by specifying a command line argument. (See the test command line descriptions in the *SunVTS 2.0 Test Reference Manual*.)

```
# ./fbtest -o dev=cgthree0,lock=Enable
```



Caution – Do not run TTY mode on the console monitor and frame buffer tests concurrently; the frame buffer tests may fail. For information about how to start the TTY interface and connect to a remote machine’s SunVTS kernel, see “In TTY Mode” in Chapter 2.

If you are starting SunVTS with `vtmui` without running `vtmsk` first, you must add the host name to the `xserver` using the `xhost` command.

Note – If window locking is disabled (unlocked) on frame buffers that are running `vtmui`, or you move the mouse, the SunVTS tests will return spurious error messages. Even slight mouse movements can cause a test to fail.

Testing Multiple Frame Buffers

These rules apply when testing multiple frame buffers (displays) simultaneously:

- You can test multiple frame buffers on a system simultaneously, but only the console monitor can run windows. The console monitor is the monitor connected to the frame buffer appointed by `/dev/fb`.
- The frame buffer that is running `windowd` must have frame buffer locking enabled to avoid spurious test failures. Other frame buffers must have frame buffer locking disabled.

- By default, SunVTS enables frame buffer locking on the console frame buffer (/dev/fb). If your system has more than one frame buffer, you must disable frame buffer locking on all of them except the one running windows. If you are running a frame buffer test from a command line, you can disable or enable frame buffer locking by specifying a command line argument. (See the test command line descriptions in the *SunVTS 2.0 Test Reference Manual*.) For example, if you were running the generic frame buffer test (fbtest), you would use the lock=Disable/Enable option to disable frame buffer locking:

```
#./fbtest -o dev=cgthree0,lock=Enable
```

Frame buffer locking is not available if SunVTS is started from a screen other than the console monitor. The frame buffer lock for the console monitor must be turned off. SunVTS user interface will not be displayed on a monitor that has frame buffer locking disabled.

Starting the Testing Session

Use the Start Button on the SunVTS Control Panel interface to start a test session. This will start testing on the peripherals. Please refer to “Start Button” in Chapter 3 for more details.

Suspending the Testing Session

During the testing session, you may need to suspend or pause all tests. For example, you may want to look at messages on the Console panel that have scrolled out of view, or you may want to view and print a log file.

Clicking the Suspend button causes all of the SunVTS tests to pause. After the test has paused, the Suspend button changes and becomes a Resume button. Clicking on the Resume button continues the testing session.

Resuming the Testing Session

Once the testing session has been suspended, it must be resumed before you can continue testing or stop testing. To resume testing, click the Resume button (see Figure 4-3). You can now stop the testing by clicking the Stop button.

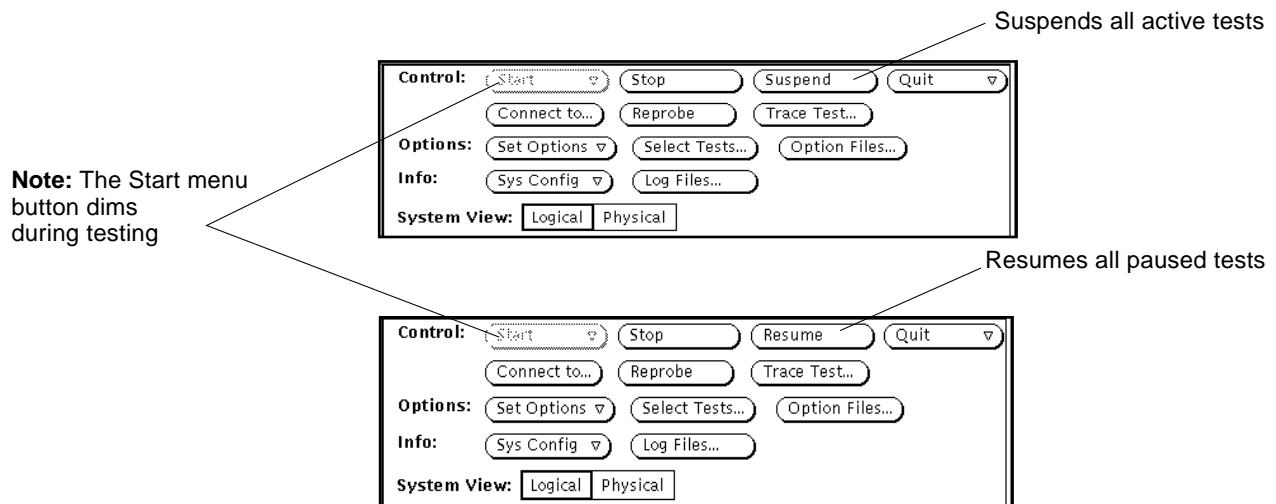


Figure 4-3 Suspend/Resume Button

Resetting the Test Environment

If the testing session needs to start all over again, without quitting SunVTS, click the Reset button. Please refer to “Reset Button” in Chapter 3 for more details.

Stopping the Testing Session

Once you have adequately tested your system, you can stop the testing session and review the results.

SunVTS ends the test execution automatically for a number of reasons. For example, if you have enabled the Single Pass option on the Option menu, the software runs all enabled tests once and stops, but the elapsed time continues to increment.

SunVTS stops if an error occurs and the run at error was not set or, if run at error was set but the error count reached the maximum number of errors.

Stop Button

Click the Stop button to stop the testing session. The System Status panel temporarily displays “stopping” while the tests wind down. The amount of time it takes to stop depends on which tests you are running. For example, the `tapetest` requires time to rewind the tape or remove the mounted partitions and temporary files. A pop-up menu will display the message “testing completed: xxx pass(es), x error(s)” when the testing is completed.

After you stop the testing session, you can view the Test Status panel to see how many passes and errors occurred per test, and you can display or print the log files.

If a test hangs, SunVTS remains in Stop mode, and waits for the test to terminate. (This situation is probably due to a hardware problem.) Deselect the test, which signals SunVTS to ignore the stopped test and return to Idle mode. Please refer to “Stop Button” in Chapter 3 for more details.

Monitoring Test Status

While SunVTS is testing the system, you can view the progress of the test by monitoring the panels, windows, and log files.

System Status Panel

The System Status displays the current activity of the SunVTS kernel. For example, the status can be idle (when not testing), testing, or stopped (when the maximum number of errors is reached, or when you stop the testing).

This panel also displays the total number of successful system passes (a system pass is when all tests have been run once), and the total number of errors from all tests. The total elapsed time is also displayed on this panel.

Test Status Panel

This panel, located below the System Status panel, displays the status of all selected tests. The status of each selected test is listed as follows:

- The Passes count shows how many times the test has completed a run.
- The Errors count shows how many times the test exited with an error. If the test has an asterisk by it, that test is currently being run.
- The letter 'T' is displayed next to the test name when Trace mode is active. While monitoring this panel, you'll notice that some tests take longer to run than others.

The Test Status panel displays information on a limited number of tests. Use the icons on the top of the panel to page through the tests.

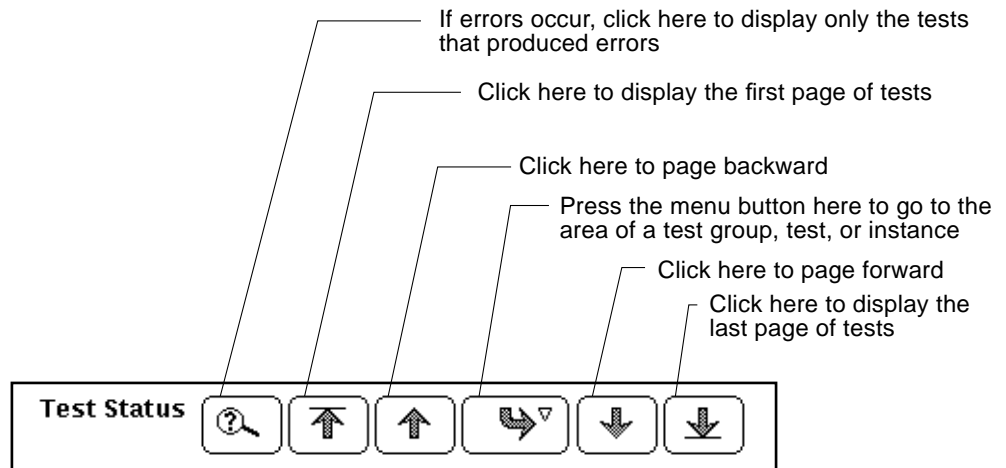


Figure 4-4 Test Status Icons

Performance Meter

This panel displays the performance statistics of the system being tested. See “OPEN LOOK Performance Meter” in Chapter 3 for more details.

Console Panel

The Console panel displays all the messages sent from the tests and SunVTS kernel. If you enabled verbose messages or system call trace messages on one or more tests, the messages appear in this window. Use the scrollbar to view these messages.

Reviewing Log Files

This section provides information about displaying, printing, and deleting log files. The Log file error message formats are also discussed in this section.

Log Files Menu

SunVTS saves the status of its progress in three log files. These files contain error information messages. You can access these files from the Log Files menu, which is displayed when you click the Log Files button (see Figure 4-5).

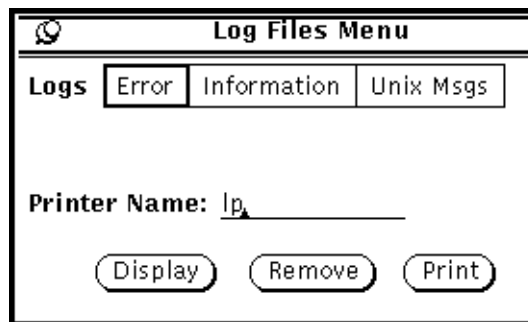


Figure 4-5 Log Files Menu

The three log files in this menu are:

- SunVTS Error Status Log:
`/var/opt/SUNWvts/logs/sunvts.err`
- SunVTS Information Log:
`/var/opt/SUNWvts/logs/sunvts.info`
- Solaris System Message Log:
`/var/adm/messages`

The `sunvts.err` file contains SunVTS test error messages and start and stop times. The status log file, `sunvts.info`, contains informative messages generated while starting and stopping SunVTS. The `messages` file is a log of all the general UNIX messages.

Displaying Log Files

You can display any of the three log files by selecting the name of the Log file and then clicking the Display button.

A pop-up window displays the selected log file. Notice that the log file's name appears at the top of the window (see Figure 4-6).

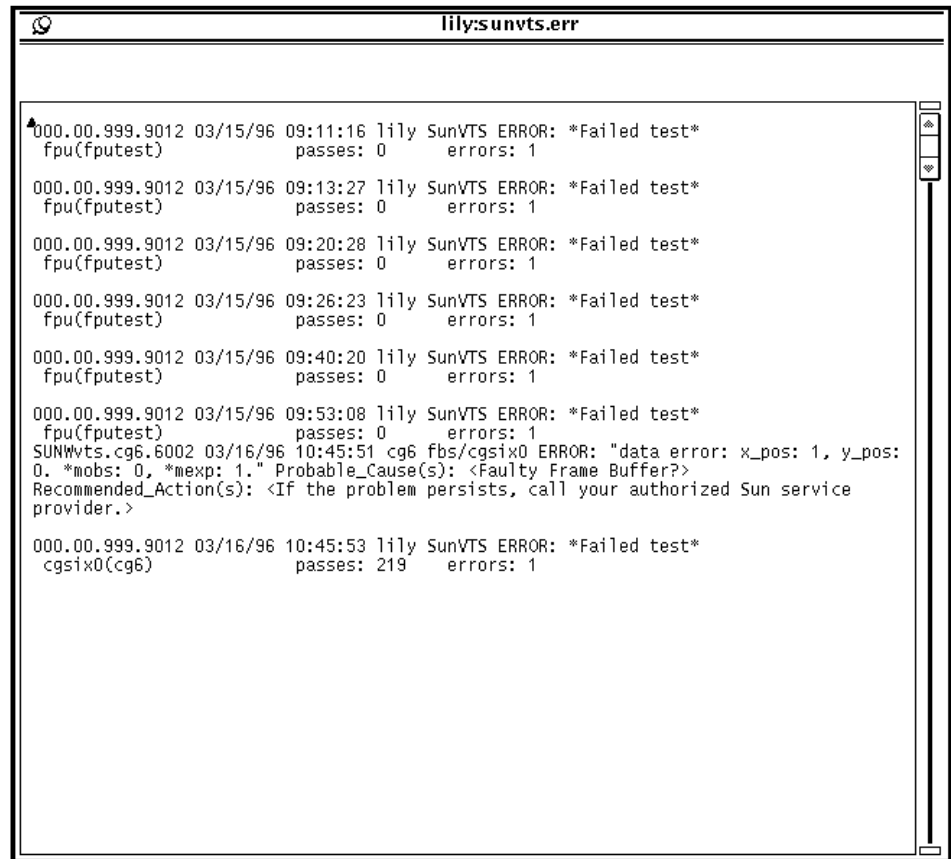


Figure 4-6 Info Log File

SunVTS Test Message Syntax

SunVTS test messages follow this format:

```

SUNWvts.testname[.subtest_name].message_number date time
testname device_name [FRU_path]ERROR/FATAL/INFO/WARNING/VERBOSE
message
  
```


Table 4-3 SunVTS Test Message Syntax

Argument	Description
<i>SUNWvts</i>	SunVTS package name
<i>testname</i>	SunVTS test name
<i>subtest_name</i>	The subtest module name (optional)
<i>message_number</i>	The message identifier; which is a unique number for the test. The number is usually within the following ranges: VERBOSE: 1 - 1999 INFO: 2000 - 3999 WARNING: 4000 - 5999 ERROR/FATAL: 6000 - 7999 FATAL: 8000 - 9998 (The number 9999 is reserved for any possible old message types in previous SunVTS releases for compatibility reasons)
<i>date time</i>	Tells when the error occurred
<i>testname</i>	The name of the test reporting the error
<i>devicename</i>	The device being tested when the error occurred
<i>FRU_path</i>	A full Solaris device path of the failed FRU; this argument varies, depending on the type of test running when the error occurred; see “Interpreting Failed FRU Information” in this chapter for details
<i>message</i>	Contains test lmessages plus probable_causes and recommended_actions

♦ To display Log Files, click the Display button on the Log Files menu (Figure 4-7).

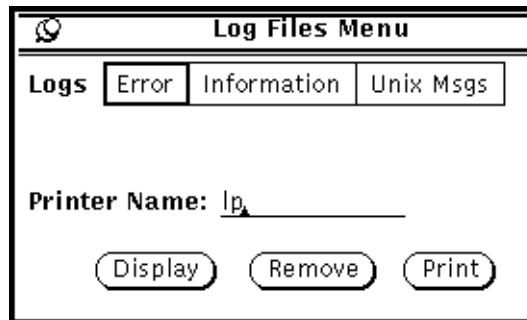


Figure 4-7 Log Files Display

- ◆ To remove Log Files, click the Remove button on the Log Files pop-up window.
- ◆ To print Error Logs, click the Print button on the Log Files pop-up window.

Note – These logs can be very long. Make sure you want the entire file before printing it.

Interpreting Failed FRU Information

When a test fails, SunVTS incorporates information about the failed FRU into the error message. The error message indicates the location of the failed FRU on the system. The location is indicated in the form of a path that starts with the board number to which the FRU is connected.

For example, the FRU path of `cpu-unit0` on board number 0 will be:

```
cpu-unit0(board0)
```

That of a disk, `c0t0d0`, controlled by `esp0` on board 0 will be:

```
c0t0d0(board0/sbi0/esp0)
```

That of a disk, c1t0d0, connected to a soc on board 1 will be:

```
c1t0d0(board1/sbi1/soc1/pln1)
```

Note - This feature is available only on the server systems: SS1000, SS2000, Ultra Enterprise 6000, Ultra Enterprise 4000, and Ultra Enterprise 3000.

Debug Features

The following options can be used to debug your system.

- **Verbose** - displays a verbose message indicating that the operation is being performed on the device being tested.
- **Core File** - creates a Core file when selected. If the SunVTS bin directory is writable, `core.<testname>.xxxxxx` is the Core file name, where `<testname>` is the test that dumped core, and `xxxxxx` is a character string generated by the system in order to make the file name unique. When Core File is disabled, a message indicating the signal that caused the failure is displayed and logged.
- **Run On Error Option** - continues testing until the Max Errors number is reached.
- **Processor Affinity** - lets you attach a process list to a specific processor. Advanced users can use this option to isolate faults of a specific processor.

Testing with Record and Replay Options

The purpose of the Start with Record and Replay options is to record a sequence of significant events during a testing session, and to replay or view this information at a later time. Once a testing session is recorded, you can use this information to drive the SunVTS kernel in such a way as to reproduce the recorded sequence of events. These record and replay features provide a way to reproduce testing conditions, a process that is helpful for debugging.

The Record with Replay option can closely reproduce the ordering of the events, but it cannot reproduce the time periods of these events because the execution times may vary from one run to another. When scheduling a replay using this option, only the ordering and relative scheduling time differences between events during the original run are considered.

These options are limited in the way they replay a testing session because the Replay option can only be controlled when a command is started, not when the command is completed.

The Record with Replay option records the following test events:

- Starting
- Stopping
- Enabling/Disabling Intervention mode
- Selecting and Deselecting

The events are recorded in a file called `vts_replay_file`, which will be saved in the log directory you specify. If no log directory is specified, the `/var/opt/SUNWvts/logs` directory is used by default.

The first part of the `vts_replay_file` consists of the SunVTS kernel and test options settings at the time when recording was started. This information is used during the replay to restore the option settings to what they were during recording.

The events are recorded following the saved option settings. For each event, information is recorded in the following format:

```
event_type rel_time target_object [instance_num]
[event_specific]
```

The following table describes the significance of each event string.

Table 4-4 vts_replay_file Event String Descriptions

Event String	Description
event_type	The type of event can be one of the following: START, STOP, SELECT, DESELECT, or INTERVENTION
rel_time	The time in seconds since the preceding event
target_object	The object involved in the event. For example, fpu (fputest). This field is ignored if the value is a dash (-) as in the case of an INTERVENTION event
instance_num	The instance number of the test. A valid number is required for the START and STOP events. This field has a value of -1 for INTERVENTION, SELECT, and DESELECT events
event_specific	Any additional event-specific information required to replay the event. This field contains the test command line arguments for the START event. For the INTERVENTION event, the value describes the state: either enabled, or disabled. This field is blank in the case of STOP, SELECT, and DESELECT

Installing .customtest

The SunVTS custom test capability provides an alternative interface to run user-developed tests.

- ◆ **To install a custom test, create a text file called `.customtest` in the current SunVTS bin directory.**

The options you set in the `.customtest` file become the default options for each test. You can change these options using the pop-up option menus on the SunVTS window interface, but the Reset button returns the options to the default settings specified in the `.customtest` file.

- ◆ **To probe a specific device, or to always display a custom test, enter the test label, test name, and options specifications in the `.customtest` file.**

When invoked SunVTS displays this test.

An example of a `.customtest` file is included in the SunVTS bin directory. The default path is `/opt/SUNWvts/bin`.

▼ To Copy the Test Binary to the `sunvts` Installation Directory

1. Edit `.customtest` according to the following format.
2. Restart `sunvts` or reprobe the system configuration.

Note – If `.customtest` is renamed as `.customtest-<group>`, all its user tests will appear under the specified `<group>`.

`.customtest` *File Format*

The `.customtest` file is located in the SunVTS installation directory. Each line in this file is made up of two or more fields that are separated by a semicolon where:

- The first field is the label/device name (MANDATORY FIELD).
- The second field is the test name (MANDATORY FIELD).
- The third field may be an option line (OPTIONAL FIELD). If used, this field must be in the format specified.
- The fourth field is used if the test is scalable. If used, add “SCA” in this field.

A user test definition requires a minimum of two fields, separated by a semicolon, as shown in the following `.customtest` file format examples:

```
% your_label_name;your_test_name
```

◆ To add the scalability option, append the keyword SCA.

```
% your_label_name;your_test_name;SCA
```

◆ To custom build an option menu, add an option specification:

```
% Option_Name<Option_Type|Value|Default_Value|Command_Line_Option
```

◆ To specify more than one option, separate each option by a comma:

```
% label_name;test_name;Numeric<NUMERIC|0,100|50|numeric>,
Exc_Choice<EXC_CHOICE|Top,Middle,Bottom|Middle|exc_choice>,
Inc_Choice<INC_CHOICE|Left,Center,Right|Left+Center+Right|inc_choice>,
Toggle<TOGGLE|This,That|This|toggle>, Text <TEXT|20|Type_Here|text>,
Slidebar<SLIDEBAR|0,10|5|slidebar>, Errors<CYCLE|Yes,No|No|errors>,
Cycle<CYCLE|First,Second,Third|First|cycle>;SCA
```

SunVTS invokes the above test as follows:

```
% ./test_name -s[vq..] [-i n] -o dev=user[0,1..],Command_Line_Option=Value...
```

The `customtest` facility does not allow a test probe to be attached. You must ensure that the binaries are compatible with the version of the Solaris kernel on which SunVTS is currently running.

`vtsprobe` *Utility*

Use the `vtsprobe` utility to display the results of the SunVTS kernel's hardware device probe. `vtsprobe` lists all of the test machine's devices and their configuration information, as well as their corresponding hardware tests.

Note – The SunVTS kernel must be running on the test machine for the `vtsprobe` command to work. See “Using Other Commands to Start SunVTS” in Chapter 2 for instructions on how to start the SunVTS kernel.

Using vtsprobe on a Local Machine

▼ To Display the Devices of a Machine Running the SunVTS Kernel

1. **Change directories to the SunVTS `bin` directory.**
The directory path is `/opt/SUNWvts/bin` by default.

2. Type `vtsprobe` to display the list of hardware devices.

Code Example 4-1 vtsprobe Example

```
example% vtsprobe

Processor(s)
  fpu(fputest)
    Architecture: sparc
    Type: TI TMS390Z50 SuperSPARC chip
  system(systest)
    System Configuration: sun4m SPARCstation 10 (1 X 390Z50)
    System clock frequency: 40 MHz
    SBUS clock frequency: 20 MHz

Memory
  kmem(vmem)
    Amount: 233580KB
  mem(pmем)
    Physical Memory size:48 Mb

Network
  isdn0(isdntest)
  le0(nettest)
    Host_Name: example
    Host Address: 131.155.56.122
    Host ID: 12347f61
    Domain Name: widget.com

SCSI-Devices(esp0)
  c0t0d0(rawtest)
    Logical Name: c0t0d0
    Capacity: 510.23MB
    Controller: esp0
  c0t0d0(fstest)
    Logical Name: c0t0d0
    Controller:esp0
  tape0(tapetest)
    Drive Type: Exabyte EXB-8200 8mm Helical Scan

Comm.Ports
  zs0(sptest)
    term/a & term/b

Graphics
  cgsix0(cg6)
    5000KB required for testing.

OtherDevices
```


Code Example 4-1 vtsprobe Example (Continued)

```
bpp0(bpptest)
  Logical name: bpp0
diskette(rawtest)
  Logical Name:diskette
  Controller:Intel 82077
diskette(fstest)
  Logical Name:diskette
  Controller:Intel 82077
sound0(audio)
  Audio Device Type: DBRI Speakerbox
```

Using vtsprobe on a Remote Machine

You can also display the hardware devices of a remote machine that is running the SunVTS kernel.

▼ To Display Devices of a Remote Machine Running the SunVTS Kernel

1. Change directories to the SunVTS bin directory.

This directory is `/opt/SUNWvts/bin` by default.

2. Type `vtsprobe -h hostname`, where *hostname* is the hostname of the remote machine.

The `vtsprobe` utility then connects to the remote machine, and displays the remote machine's hardware devices.

The output will be displayed on the window from which `vtsprobe` is invoked.

Option Files

Option files provide a method by which the current SunVTS global and test-specific options can be saved to a file for later use.

The SunVTS user interface provides an Option Files button that lets you to load, store, or remove an Option file by name. The file name can be any ascii file name.

When the Option file window displays, click the Load button to restore the SunVTS options selection specified.

Although hand editing of the Option file is allowed, the file is fairly strict regarding format requirements. Unnecessary or spurious characters in the Option files may cause unexpected actions with the SunVTS kernel/user interface.

Storing an Option file saves the current settings from the global test options and specific test settings to a file in the `/var/opt/SUNWvts/options` directory (see Figure 4-8).

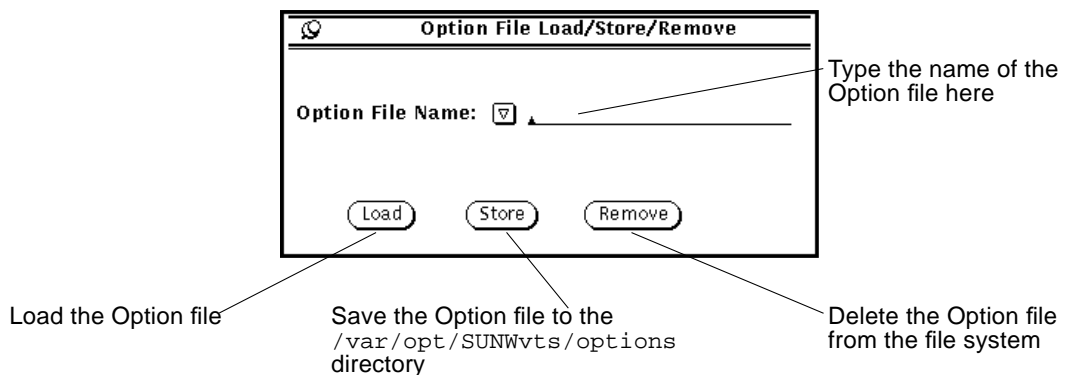


Figure 4-8 Option File Window

▼ To Save an Option File

1. Type the Option file name in the test field.

2. Click the Store button.

All the current system and test options can now be saved as a file.

After you save an Option file, you can load it at the command line when you start the SunVTS kernel with the `-o` option. For example, if you create an Option file called `test_defaults`, you can load this Option file when you start the SunVTS software by typing:

```
# ./sunvts -o test_defaults
```

▼ To Load a Previously Saved Option File

Note – If the Option file name is `.sunvts`, it is loaded by default every time SunVTS comes up.

1. Press the MENU mouse button on the Option File menu button to display the available Option files.

All Option files saved in `/var/opt/SUNWvts/options` are displayed in the Option File Name menu.

2. Select the Option file you want to load.

Figure 4-9 shows an example of selecting an Option file named `SystemTest.defaults` from the Option File Name menu.

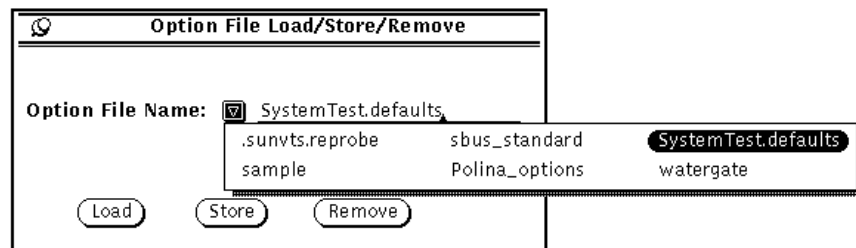


Figure 4-9 Option File Name Menu

3. Click the Load button.

After loading the Option file, the SunVTS Control Panel window reflects the new Option values.

▼ To Remove an Option File:

1. **Press the MENU mouse button on the Option File Name menu button to display the available Option files.**
2. **Select the Option file you want to delete.**
3. **Click the Remove button.**
After prompting you for confirmation, the Option file is deleted from the system.

Problem:

The `inetd` invoked kernel takes an unusually long time to come up.

Solution:

The user interface or `vts_cmd` call can return prematurely. It can be reset by determining the `pid` (process id) of the `inetd` process and sending a HUP signal to it. To do this type:

```
# ps _ale:grep inetd
# kill -HUP <pid>
```

Problem:

A device probe failed, due to a problem in the device. If this occurs, information about the failed device is displayed on the command line.

Solution:

Fix or disconnect the failed device, reboot (`boot -r`), and start SunVTS again.

Problem:

If OPEN LOOK software is not installed, TT (ToolTalk) session is not available to the SunVTS kernel. In this case, the SunVTS kernel is running, but it is not accessible.

Solution:

Install the OPEN LOOK software and start SunVTS again.

Problem:

If the SunVTS kernel is not running when vtsui is invoked, the user interface starts and indicates that hostname SunVTS kernel is not responding.

Solution:

Start the SunVTS kernel on the <host> system using the procedure described in “Using Other Commands to Start SunVTS” in Chapter 2 and from the user interface select Connect to, to reconnect.

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