SunVTS™ 6.0 Test Reference Manual

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Contents

Preface

SunVTS™ is the Sun Microsystems™ Validation Test Suite. SunVTS is a comprehensive software diagnostic package that tests and validates Sun™ hardware by verifying the configuration and functionality of most hardware controllers, devices, and platforms.

SunVTS is primarily used from a graphical user interface (GUI), for the Common Desktop Environment (CDE). This book describes SunVTS tests that run on machines with SPARC™ and x86 architectures. The descriptions include specific test options, procedures, and error messages.

This book is primarily written as a reference for SunVTS test specific information. Refer to the *SunVTS User's Guide* for overall SunVTS information. Developers or experienced users who want to run the SunVTS diagnostic application will find these documents useful.

Note – The Solaris release with which this version of SunVTS is delivered supports systems that use the SPARC® and x86 families of processor architectures: UltraSPARC®, SPARC64, AMD64, Pentium, and Xeon EM64T. The supported systems appear in the *Solaris 10 Hardware Compatibility List* at `http://www.sun.com/bigadmin/hcl`. This document cites any implementation differences between the platform types.

In this document the term x86 refers to 64-bit and 32-bit systems manufactured using processors compatible with the AMD64 or Intel Xeon/Pentium product families. For supported systems, see the *Solaris 10 Hardware Compatibility List*.

Before You Read This Book

In order to fully use the information in this document, you must have thorough knowledge of the topics discussed in these books:

- *SunVTS User's Guide*
- *SunVTS Quick Reference Card*

How This Book Is Organized

This book is organized as follows:

Chapter 1 describes SunVTS requirements, test modes, user interfaces, the collection of tests, and how to run a test from the command line.

The remaining chapters describe the individual SunVTS tests, their options, applicable test modes, and command-line syntax. These chapters are arranged in alphabetical order according to each test name.

Appendix A provides information about the serial and parallel port loopback connectors that are required by some of the SunVTS tests.

Using UNIX Commands

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

Refer to one or more of the following for this information:

- *Solaris Handbook for Sun Peripherals*
- Software documentation that you received with your system
- Solaris™ Operating System documentation, which is at

  `http://docs.sun.com`

Shell Prompts

Shell	Prompt
C shell	*machine-name*%
C shell superuser	*machine-name*#
Bourne shell and Korn shell	`$`
Bourne shell and Korn shell superuser	`#`

Typographic Conventions

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

Related Documentation

This manual covers SunVTS version 6.0 tests. It serves as a reference companion to the SunVTS 6.0 documents listed below.

Application	Title	Part Number
Installation and Navigation	*SunVTS 6.0 User's Guide*	817-7664-10
Quick Reference Card	*SunVTS Quick Reference Card*	817-7686-10

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SunVTS 6.0 Test Reference Manual, part number 817-7665-10

CHAPTER 1

Introduction

This manual describes SunVTS™ Version 6.0 tests that are distributed on the Solaris 10 Software CDs.

The Sun™ Validation and Test Suite (SunVTS) software performs multiple diagnostic hardware tests from a single user interface. SunVTS verifies the connectivity, functionality, and reliability of most hardware controllers and devices.

SunVTS is composed of many individual tests that support testing of a wide range of products and peripherals. Most of the tests are capable of testing devices in a 32-bit or 64-bit Solaris™ environment.

Only the following tests are supported on x86 (and SPARC) platforms. The current x86 support is for the 32-bit operating system only. See "x86 Solaris Support" on page 2.

- CD DVD Test (`cddvdtest`)
- CPU Test (`cputest`)
- Disk and Floppy Drives Test (`disktest`)
- Data Translation Look-aside Buffer (`dtlbtest`)
- Floating Point Unit Test (`fputest`)
- Network Hardware Test (`nettest`)
- Ethernet Loopback Test (`netlbtest`)
- Physical Memory Test (`pmemtest`)
- Serial Port Test (`serialtest`)
- System Test (`systest`)
- Universal Serial Board Test (`usbtest`)
- Virtual Memory Test (`vmemtest`)

Use SunVTS to test one device or multiple devices. Some of the major test categories are:

- Audio tests
- Communication (serial and parallel) tests
- Graphic/video tests
- Memory tests
- Network tests

- Peripherals (disks, tape, CD-ROM, DVD-ROM, printer, floppy) tests
- Processor tests
- Storage tests

Such flexibility means that the proper test modes and options need to be selected to maximize its effectiveness. This book covers the individual test options, modes, and requirements. For overall test configuration modes and options refer to the *SunVTS User's Guide*.

Note – When an error occurs in VTS testing, the test message window displays the error number, the error description, the probable cause of the error, and the recommended actions. Because this information is displayed at the time of the error, error messages are not included in this manual.

The default installation directory for SunVTS is `/opt/SUNWvts.` However, when you are installing SunVTS, you can specify a different directory. Refer to the *SunVTS User's Guide* for installation information.

Note – SunVTS does not support processor sets. If processor sets are defined, you must first delete the processor sets before running SunVTS.

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x86 Solaris Support

Starting with Solaris 10, the SunVTS infrastructure and a few core diagnostics are available for x86 Solaris platforms. The current x86 support is for the 32-bit operating system only. x86 support was first delivered with Solaris 10 Beta 6.

You must install the x86 version of the SunVTS packages to be able to perform SunVTS on x86 platforms. The software packages use the same names as in the SPARC environment. The SunVTS packages delivered separately for both x86 and SPARC Solaris platforms are as follows:

- `SUNWvts` – Contains the SunVTS core framework that includes the kernel and user interface.
- `SUNWvtsmn` – Contains the SunVTS online manual pages
- `SUNWvtsr` – Contains the SunVTS framework configuration files in the root partition (Superuser).
- `SUNWvtsts` – Contains the SunVTS test binaries.

The SunVTS components available for x86 Solaris platforms are as follows.

Infrastructure:

- sunvts
- vtsk
- vts_cmd
- vtstty
- vtsui
- vtsprobe

SunVTS Tests:

- CD DVD Test (cddvdtest)
- CPU Test (cputest)
- Disk and Floppy Drives Test (disktest)
- Data Translation Look-aside Buffer (dtlbtest)
- Floating Point Unit Test (fputest)
- Network Hardware Test (nettest)
- Ethernet Loopback Test (netlbtest)
- Physical Memory Test (pmemtest)
- Serial Port Test (serialtest)
- System Test (systest)
- Universal Serial Board Test (usbtest)
- Virtual Memory Test (vmemtest)

New and Consolidated Tests

The following tests are new in this release:

- CD and DVD Test (cddvdtest) – a consolidation of cdtest, cddvdrwtest, and dvdtest.
- Ethernet Loopback Test (netlbtest)
- Serial Port Test (serialtest) – a consolidation of sptest and sutest.
- Universal Serial Board Test (usbtest) – a consolidation of usbaudiotest, usbkbtest, and usbppptest.
- Parallel Port Printer Test (pptest) – a consolidation of bpptest and ecpptest.

The following tests were consolidated in this release:

- cdtest, cddvdrwtest, and sutest are consolidated into cddvdtest.
- sptest and sutest are consolidated into serialtest
- usbaudiotest, usbkbtest, and usbppptest are consolidated into usbtest.
- bpptest and ecpptest are consolidated into pptest.

Test Requirements

SunVTS Version 6.0 was first introduced and designed to run in the Solaris 10 operating system and later releases. SunVTS 6.0 is not supported on earlier relases of the Solaris operating system.

The operating system kernel must be configured to support all peripherals that are to be tested.

Some SunVTS tests have special requirements such as the connection of loopback connectors, installation of test media, or the availability of disk space. These requirements are listed for each test in the corresponding chapter in this book.

Collection of SunVTS Tests

Many individual tests make up the collection of tests in the SunVTS application. Each test is a separate process from the SunVTS kernel. Each test can be run individually from the command line or from the SunVTS user interface.

When SunVTS is started, the SunVTS kernel automatically probes the system kernel to determine the hardware devices. The devices are then displayed on the SunVTS control panel with the appropriate tests and test options. This provides a quick check of your hardware configuration, and no time is wasted trying to run tests that are not applicable to your configuration.

During testing, the hardware tests send the test status and messages to the SunVTS kernel through interprocess communication (IPC) protocols. The kernel passes the status to the user interface and logs the messages.

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. You can add new tests into the SunVTS environment without recompiling the SunVTS source code.

As of SunVTS 3.0, the SunVTS kernel and most tests support 32-bit and 64-bit operating systems. When the `sunvts` command is used to start SunVTS, the appropriate tests (32-bit or 64-bit versions) are presented.

32-Bit and 64-Bit Tests

Because each test is a separate program, you can run individual tests directly from the command line. When this is done, care must be taken to run the appropriate test (32-bit or 64-bit) that corresponds to the operating system that is running (32-bit or 64-bit). This is done by running tests from specific directories as follows:

- 32-bit tests—`/opt/SUNWvts/bin/`*testname*
- 64-bit tests—`/opt/SUNWvts/bin/sparcv9/`*testname*
  - The test is an actual 64-bit binary test if *testname* is a binary file.
  - The test is a 32-bit test capable of running in the 64-bit environment if *testname* is a symbolic link.

Note – The `SUNWvtsx` package must be installed for 64-bit SunVTS support. For more information on SunVTS packages and installation procedures refer to the *SunVTS User's Guide*.

If you use the `sunvts` command to run SunVTS, SunVTS automatically allocates 32-bit or 64-bit tests based on the 32-bit or 64-bit Solaris operating environment that is running. Therefore, the only time that you need to be concerned with the 32-bit or 64-bit operation is when you run the SunVTS kernel or SunVTS tests from the command line.

If you are not sure which operating system is running, refer to the Solaris System Administration manuals. In Solaris 10, the following command can be used to identify the application support of your system.

```
# isainfo -v
```

Note – The `isainfo` command is not available in Solaris 2.6 or earlier releases.

SunVTS User Interfaces

You can run SunVTS tests from various interfaces: The CDE graphical user interfaces, or the TTY interface. SunVTS tests can also be run individually from a shell tool command line, using the command-line syntax for each test (refer to

"Running a Test From the Command Line" on page 8). TABLE 1-1 describes the various SunVTS user interfaces. Refer to the *SunVTS User's Guide* for more information on these interfaces.

TABLE 1-1 SunVTS System Interfaces

SunVTS System Interfaces	Description
Graphical user interfaces (GUIs)	Users can select tests and test options by pointing and clicking with a mouse button in the CDE interface.
TTY interface	Users can run SunVTS from a terminal or modem attached to a serial port. This feature requires that users use the keyboard instead of the mouse, and it displays one screen of information at a time.
Command-line execution	Users can run each of the SunVTS tests individually from a shell tool command line using the command-line syntax. Each test description in this book contains the corresponding command-line syntax.

Note – To increase or decrease a numeric value in a SunVTS CDE dialog box, you can use either the up or down arrows, or type a new value in the text box and press Return. Select Apply to apply all dialog box changes.

Running a Test From a User Interface

The common way to run SunVTS testing is through a SunVTS user interface—CDE or the TTY interface.

Test configuration, control, and results are easily accessed through buttons and dialog boxes. These buttons and dialog boxes are covered in the *SunVTS User's Guide*. However, the Test Parameter Options dialog box is unique for each test, and is therefore covered in this manual.

Test Parameter Options Dialog Box

The options displayed in this menu differ for each test, but the lower set of buttons are generic and are described below.

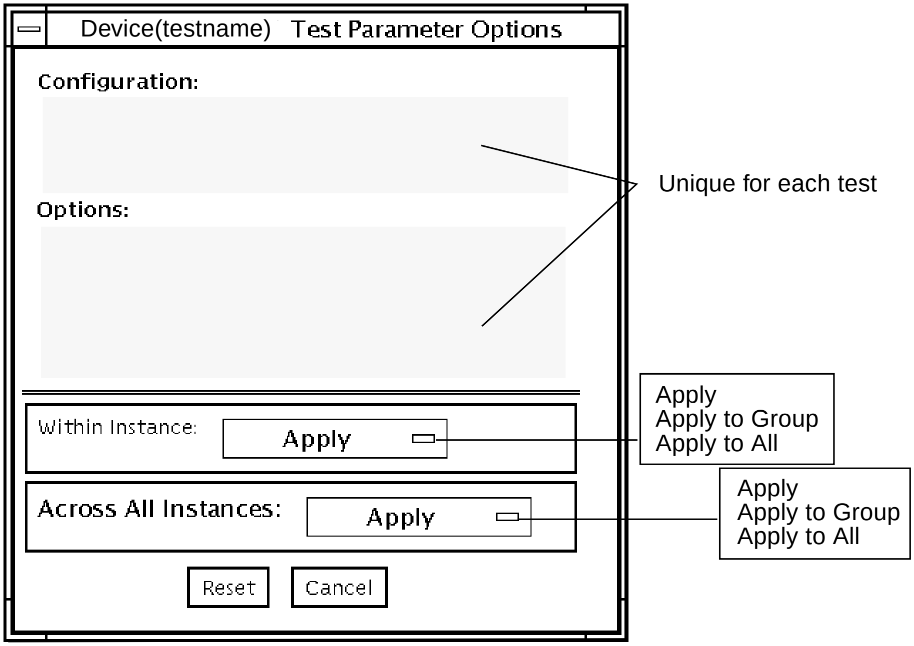


FIGURE 1-1 Test Parameter Options Dialog Box (CDE)

TABLE 1-2 Test Parameter Options Dialog Box Items

Menu Item	Description
Configuration	Information such as device type, capacity, revision, and serial numbers for the selected device. This information cannot be changed.
Options	A list of test options that are used to customize the testing of the selectable device, group, or all devices. The options are specific for each test and are covered in the test specific-chapters in this manual.
Within Instance	Provides the means to apply the settings: • to this device only with Apply, or • to all devices within this group with Apply to Group, or • to all devices (of the *same device type* for *all controllers*) with Apply to All. The option settings are only applied to one instance of the test.

TABLE 1-2 Test Parameter Options Dialog Box Items *(Continued)*

Menu Item	Description
Across All Instances	Provides the means to apply the settings globally: • to this device only with Apply, or • to all devices within this group with Apply to Group, or • to all devices (of the *same device type* for *all controllers*) with Apply to All. The option settings are applied to all instances.
Reset	Returns the option values to their default settings and closes the test parameter option menu.
Cancel	Ignores any changes made to option values and closes the test parameter option menu.

Note – The Test Parameter Options Dialog Box descriptions also apply to the Test Parameter Options menu in the TTY interface.

Running a Test From the Command Line

In some cases it may be more convenient to run a single SunVTS test from the command line rather than through a SunVTS user interface. The following information describes how to do this.

Unless specified, the test runs without the SunVTS kernel (`vtsk`). All events and errors are sent to `stdout` or `stderr` and are not logged in the log files.

When you run a test in this way, you must specify all test options in the form of command-line arguments.

There are two types of command-line arguments:

- Standard arguments—common to all tests. Refer to TABLE 1-3 for details.
- Test specific arguments—unique to a specific test. Refer to the test-specific chapters in this book for details.

The standard syntax for all SunVTS tests is:

`testname` `[`**`-scruvdtelnf`**`]` `[`**`-i`** *number*`]` `[`**`-w`** *number*`]``[`**`-o`** *test_specific_arguments*`]`

Note – 64-bit tests are located in the `sparcv9` subdirectory: `/opt/SUNWvts/bin/sparcv9/`*testname*, or the relative path to which you installed SunVTS. If a test is not present in this directory, then it might be available as a 32-bit test only. For more information, see "32-Bit and 64-Bit Tests" on page 5.

Standard Command-Line Arguments

The following table defines the standard SunVTS command-line arguments:

TABLE 1-3 Standard Command-Line Arguments

Argument	Description
`-s`	Runs a test as though it were invoked from the SunVTS kernel (`vtsk`). The default is to send the output to `stdout` or `stderr`.
`-c`	Enables a core image of the test process to be created in the current working directory upon receipt of certain signals, otherwise those signals are caught and handled to prevent a core from being generated. The default is to disable the creation of a core image.
`-r`	Enables run on error so that when an error occurs, the test continues with the next test sequence instead of exiting. The default is false.
`-v`	Runs the test in Verbose mode and displays messages with more detailed information about the testing process. The default is false.
`-V`	Displays the SunVTS version and release date of the test.
`-d`	Runs the test in debug mode and displays messages to help programmers debug their test code. The default is false.
`-t`	Runs the test in test Trace mode and displays messages that track function calls and sequences currently in use by the test code. The default is false.
`-l`	Runs the test in Online Functional mode. This is the same mode that tests run in when executed with the `vtsui.online` command. It is a non-intrusive version that will not significantly affect other applications. See the note below. The default is true.
`-x`	Runs the test in Exclusive mode.
`-n`	Runs the test in Connection mode. See the note below. The default is false.
`-f`	Runs the test in full Functional test mode. This mode assumes that the test has complete control of the device under test. See the note below. The default is false.
`-p` *number*	Defines the number of passes for scalable tests. The default is 1.

TABLE 1-3 Standard Command-Line Arguments *(Continued)*

Argument	Description
`-i` *number*	Defines the number of instances for scalable tests. The default is 1.
`-w` *number*	Defines to which instance the test is assigned; this option is for scalable tests. The default is 0.
`-o`	Indicates that the options and arguments that follow are test specific.

Note – Separate each test-specific argument by commas, with no space after each comma.

Note – If you choose to specify a test mode with the `l`, `n`, or `f` option, specify only one option at a time because only one test mode can be selected at a time.

Test-Specific Arguments

There are test-specific arguments, as described in TABLE 1-4. Test-specific arguments follow the format specified in the `getsubopt(3c)` man page. For information about test-specific arguments refer to the specific test chapter in this book.

TABLE 1-4 SunVTS Test-Specific Arguments

Argument	Description
`-o`	Separate each test-specific argument by commas, with no space after the comma. For example: `#`**`./sample -v -o dev=/dev/audio,volume=78`** The test option format is specified by the man page `getsubopt`(3C).

Testing Frame Buffers

Before running a frame buffer test, determine whether the test requires frame buffer locking. Not all frame buffer tests have a locking option. Some tests set the lock automatically. Check the test chapter for each individual test to see if this step is needed. If locking is required, you can set the lock in one of two ways:

- If you are using the CDE SunVTS interface, go to the Option menu of the graphic test and select Enable for the frame buffer locking option.
- If you are working from the command line, you can enable frame buffer locking with the `lock=e/d` option. For example, to run the generic frame buffer test (`fbtest`) with a locked frame buffer, enter:

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

(See the test command line argument descriptions in this manual.)

Caution – If frame buffer locking is disabled (unlocked) on frame buffers that are running `vtsui`, or if you move the mouse, you will receive false error messages. Even a slight mouse movement can cause a test to fail.

Caution – Disable the Power Management screen saver option and the Save/Resume option before you run any of the SunVTS frame buffer tests. For information on disabling these Power Management features, refer to the Power Management chapter in the *Solaris Common Desktop Environment: Users's Guide* in the Solaris 9 User Collection. This document is available at: `docs.sun.com`.

Caution – If you are using the CDE interface for SunVTS, do not conduct frame buffer tests through the `dtlogin` window. Log in as `root` and disable the auto-logout option.

Caution – Do not run TTY mode and frame buffer tests concurrently on the console monitor. The frame buffer test may fail.

Testing Multiple Frame Buffers

The following rules apply when you test multiple frame buffers (displays) simultaneously:

- Only the console monitor can run the window environment (such as CDE). The console monitor is the monitor connected to the frame buffer appointed by `/dev/fb`. SunVTS enables frame buffer locking on the console monitor by default.

- The frame buffer that is running the window environment must have window locking enabled to avoid false test failures. All other frame buffers must have window locking disabled.

Remote Testing of Frame Buffers

If you start `sunvts` or `vtsk` from a screen other than the console monitor, frame buffer locking is not available. In this case:

- Disable the window locking option on the remote screen by setting it to `d`.
- Enable frame buffer locking for the console monitor, as shown in the example above. The SunVTS user interface cannot display on a monitor if locking is disabled.

Do not run any graphic programs (including `vtsui`) on the remote frame buffer during graphic testing.

CHAPTER 2

SunATM Adapter Test (atmtest)

The atmtest checks the functionality of the SunATM™-155 and SunATM-622 SBus and PCI bus adapters.

It runs only in loopback (external or internal) mode. The asynchronous transfer mode (ATM) adapter, and ATM device driver must be present. To run the atmtest in external loopback mode, a loopback connector must be attached to the ATM adapter. The internal loopback mode does not require a loopback connector.

atmtest uses DLPI RAW mode to talk to the device driver. It establishes a virtual circuit (VC) to send a message, receive a message, and compare messages. If the message does not match, or the message is out of sequence, it displays an error message.

Using a random number generator, atmtest sends data into a data buffer and then sends each message from a different starting point. This assures that no two consecutive messages are the same.

atmtest can test more than one virtual circuit. The more virtual circuits used increases the stress level of the test. atmtest automatically selects the virtual circuit number which is unique to the test.

atmtest is nonscalable because it provides multiple virtual circuits to be tested by a single instance.

atmtest Test Requirements

atmtest can only be selected when the Intervention mode is enabled since it requires a loopback connector for external loopback testing. While Intervention mode is enabled, atmtest and nettest are both available as default selections; however, you must deselect nettest when testing the ATM device.

Bring the ATM interface down to make sure that the interface is in offline mode before running `atmtest`.

Note – Do not run `nettest` while running `atmtest`.

Note – The external optical loopback test requires a 62.5 micron cable.

`atmtest` Options

To reach the dialog box below, right-click on the test name in the System Map and select Test Parameter Options. If you do not see this test in the System Map, you might need to expand the collapsed groups, or your system may not include the device appropriate to this test. Refer to the *SunVTS User's Guide* for more details.

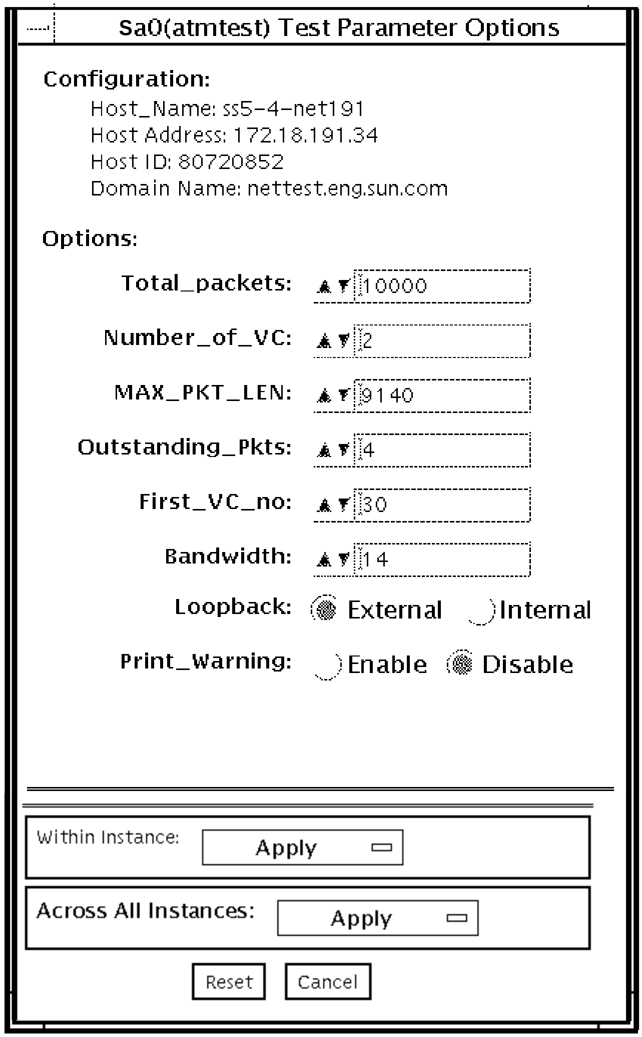


FIGURE 2-1 `atmtest` Test Parameter Options Dialog Box

TABLE 2-1 `atmtest` Options

Options	Description
Configuration	The post address, host ID, and domain name of the system being tested.
Total packets	The total number of packets sent. The default number of packets sent is 10000.
Number of VC	The default number of virtual circuits is 2. The `atmtest` uses these two virtual circuits to send out messages simultaneously. The message is received in sending order.
MAX_PKG_LEN	The maximum packet length to be used by the test to send out the data. The default number is 9140.
Outstanding_pkts	Describes the maximum number of outstanding packets. `atmtest` stops sending messages when the outstanding packet count is more than the number of packets this field specifies.
First_VC_no	Enables the user to set up the starting virtual circuit number to be used for each `atmtest` instance. `atmtest` can automatically avoid virtual circuit numbers that have already been used.
Bandwidth	Enables the user to select different bandwidths to test. The default number is 14.
Loopback	Enables the user to select either the external loopback field or internal loopback field. The default selection is the external loopback field. A loopback connector is only needed for external loopback testing.
Print Warning	Disabled by default. Click Enable to see warning errors, such as retry on timeout.

`atmtest` Test Modes

TABLE 2-2 `atmtest` Supported Test Modes

Test Mode	Description
Functional (Offline)	Runs the full set of tests.

`atmtest` Command-Line Syntax

`/opt/SUNWvts/bin/atmtest` *standard_arguments*,**`-o dev=`***device*,**`tpkts=`***n*,**`nv=`***n*,**`ml=`***n*,**`bw=`***n*,**`opkts=`***n*| **`warn`**|**`ld`**|**`sd`**|**`sl`**|**`nc`**|**`ns`**,**`vcf`**=*n*

TABLE 2-3 `atmtest` Command-Line Syntax

Argument	Description
`dev=`*device*	Specifies the device name to be tested, such as `ba0` or `sa0`.
`tpkts=`*n*	Specifies the number of packets to loopback, -1 for continuous [1...2147483647, -1].
`nv=`*num_vc*	Specifies the number of simultaneous virtual circuits to be tested.
`ml=`*max_len*	Specifies the maximum length of the random packet.
`bw=`*bandwidth*	Specifies the bandwidth in MBits/s of a virtual circuit.
`opkts=`*n*	Specifies the number of packets for each virtual circuit that can be transmitted without receiving a corresponding packet.
`warn`	When enabled, prints warning messages.
`ld`	The internal loopback mode is selected.
`sd`	Changes the payload data to static instead of random.
`sl`	Changes all packets to their maximum length.
`nc`	Instructs the test not to check the receive payload (improves throughput).
`ns`	Instructs the test not to exit on a packet reception failure.
`vcf`=*n*	Specifies the first virtual circuit number used.

Note – 64-bit tests are located in the `sparcv9` subdirectory: `/opt/SUNWvts/bin/sparcv9/`*testname*, or the relative path to which you installed SunVTS. If a test is not present in this directory, then it might be available as a 32-bit test only. For more information, see "32-Bit and 64-Bit Tests" on page 5.

CHAPTER 3

Audio Test (`audiotest`)

The `audiotest` verifies the hardware and software components of the `audio` subsystem. This test supports all Sun audio implementations.

This test will work with exclusive access devices (only one process or application available at a time), or with newer audio devices which support the software mixer feature available in the Solaris 8 operating environment.

Note – `audiotest` turns the mixer off automatically at run time. Shut down all audio applications before running `audiotest`, as Online mode is not supported. The mixer is restored after testing.

This test is not scalable.

The availability of the following subtests depends on the particular `audio` implementation being tested.

`audiotest` Subtests

TABLE 3-1 `audiotest` Subtests

Subtest	Description
Record/Play test	This test plays and records one second of data. It does not check data. This test is run on all audio implementations.
Crystal test	The crystal test measures the accuracy of the crystal that generates the sample rate clock. It does this by playing a one-second signal and then measuring the actual time required to play the signal. This measurement is performed for each of the eight standard sample rates. This test is available for `dbri`(7) and `audiocs`(7) audio implementations
Loopback tests	This test verifies the functionality and signal quality of the audio ports. The test simultaneously plays and records a known signal. The recorded signal is analyzed for loop gain and signal-to-noise ratio plus distortion. This is repeated at various sample rates, encodings, precisions and channels. The audio ports that are supported depend on the audio implementation under test. The `audiocs(7)` implementation supports loopbacks from/to headphone, line-out, microphone, and line-in ports. The `dbri(7)`/speakerbox implementation supports fewer ports. The `audioamd(7)` implementation does not support loopback tests. Most tests require a stereo loopback cable. Note: The microphone loopback tests require special hardware and are used by manufacturing centers and special test facilities. Do not invoke the microphone loopback tests unless you have the required hardware.
Controls test	This test verifies the three control buttons on the Sun speakerbox. The Controls test plays music while the user is prompted to press the Volume Down, Volume Up, and Mute buttons in a specific order. If no button is pressed in 30 seconds the test fails. This test is only supported on the `dbri`(7)/speakerbox implementation.
Audio test	This test plays a 30-second music file out of the speaker or headphone. The full benefit of this test is only realized if the user listens to the output. Badly distorted audio or inaudible music indicates a problem. This test is supported on all audio implementations.

audiotest Options

To reach the dialog box below, right-click on the test name in the System Map and select Test Parameter Options. If you do not see this test in the System Map, you might need to expand the collapsed groups, or your system may not include the device appropriate to this test. Refer to the *SunVTS User's Guide* for more details.

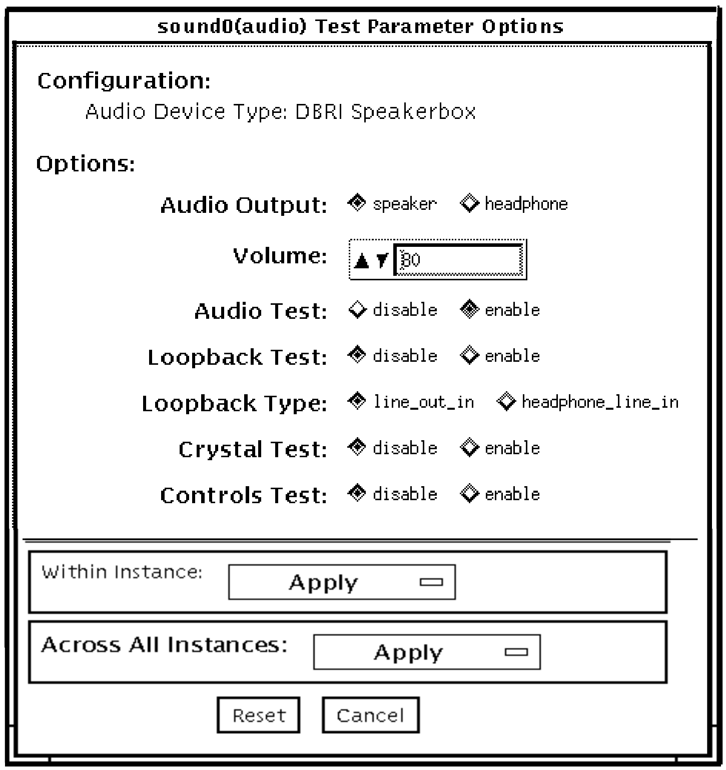


FIGURE 3-1 `audiotest` Test Parameter Options Dialog Box

Note – Upon startup, the SunVTS probe utility determines which audio implementation is present and adjusts the `audiotest` Option menu appropriately. Your dialog box may look different than the one pictured here, but will contain some or all of these options.

Note – The internal loopbacks are only active if the audio jacks are unused (nothing connected).

Some options can only be selected through the command line. See the command-line option descriptions in “`audiotest` Command-Line Syntax” on page 23.

TABLE 3-2 `audiotest` Options

Option	Description
Audio Output	Selects the output port for the Music Play test.
Volume	Sets the volume for the Music Play test.
Audio test	Enables or disables the Music Play test. This test is enabled by default.
Loopback test	Enables or disables the Loopback test. A loopback cable must be installed between the selected ports to run external loopback tests. This test is disabled by default.
Loopback type	Selects the type of Loopback test to run.
Crystal test	Enables or disables the Crystal test. This test is disabled by default.
Controls test	Enables or disables the speakerbox Controls test. This is an interactive test. The user is prompted to press the control buttons on the speakerbox. This test is disabled by default.

Note – Do not run the Crystal test while running other SunVTS tests. The Crystal test is timing-dependent. If the system is too busy, it fails due to time-out errors.

---

audiotest Test Modes

TABLE 3-3 audiotest Supported Test Modes

Test Mode	Description
Connection test	A simple open and close is performed. No data is transferred. The test returns a pass if the device can be opened and closed successfully. If the device cannot be opened because it is busy, then it is assumed that the device is successfully connected to another process and the test passes.
Functional (Offline)	The record/play test is run and you can choose to run any of the tests described earlier. In this mode, the test will fail if the device is busy.

audiotest Command-Line Syntax

/opt/SUNWvts/bin/audiotest *standard_arguments* **-o dev=/dev/sound/***unit_no***,I=/dev***ioctl_device***, M,L,Q,S,T=***loopback_test_type***, X,E,LE,CD,CDD=***CD_device_name***,CDT=***track_number***,CDG=***play_gain***, CDL=***play_time***,W,MF=***filename***,TF=***filename*

TABLE 3-4 audiotest Command-Line Syntax

Argument	Description
dev=/dev/*audio_device*	Specifies the audio device to be tested. The default is dev=/dev/audio.
I=/dev/*ioctl_device*	Specifies the audio ioctl device to be tested. The default is /dev/audioctl.
M	Enables the Music Play test.
L	Enables the Loopback test.
Q	Enables the Quality test. This option does the same thing as L option except that it prints an extra status message upon completion.
S	Enables the speakerbox Controls test.

TABLE 3-4 `audiotest` Command-Line Syntax *(Continued)*

Argument	Description
T=*loopback_test_type*	Specifies the type of Loopback test. The default is 1; the choices are listed below: • 0—Codec Internal Loopback (CS4231 audio only) • 1—Line-in/Line-out • 2—Headphone/Line-in • 3—Headphone/Microphone • 4—Speaker/CD-input • I1—Internal Line-in/Line-out • I2—Internal Spk/Mic • I3—Internal Headphone/Aux1 • I4—Internal Speaker/Aux1 • I5—Internal Headphone/Mic Note: Test type 0 is always run by default on CS4231 audio implementations. Test types 3 and 4 require special hardware, and are used by manufacturing centers and special test facilities. Do not invoke these tests unless you have the required hardware.
X	Enables the Audio Crystal test.
E	Continues testing if an error occurs.
LE	Loops on error. This plays the signal data in a continuous loop.
CD	Enables the `cdtest`. This is for systems with an internal CD-ROM drive. A CD-ROM with music tracks must be loaded prior to running this test.
CDD=*CD_device_name*	Specifies the raw device name for the CD-ROM drive. The default is `CDD=/dev/rdsk/c0t6d0s0`.
CDT=*number*	Specifies the track number of the CD-ROM to play. The default is to play the first track on the disc.
CDG=*play_gain*	Specifies the play gain of the CD Play test (0 to 255). The default is 120.
CDL=*play_time*	Specifies the number of seconds to run the CD Play test. The default is 30 seconds.

TABLE 3-4 `audiotest` Command-Line Syntax *(Continued)*

Argument	Description
`W`	Shows warning messages during the Loopback test.
`MF=`*filename*	Selects an optional music file.
`TF=`*filename*	Specifies an optional tolerance file. Note: The tolerance file is used by manufacturing centers and special test facilities. Do not use this option unless you are familiar with the tolerance file format.

Note – 64-bit tests are located in the `sparcv9` subdirectory: `/opt/SUNWvts/bin/sparcv9/`*testname*, or the relative path to which you installed SunVTS. If a test is not present in this directory, then it might be available as a 32-bit test only. For more information, see "32-Bit and 64-Bit Tests" on page 5.

CHAPTER 4

Blade Support Chip Test (`bsctest`)

Caution – The bsctest exercises the Blade Support Chip and supporting hardware used in Sun Fire B100 blade systems. This includes the Open Boot Prom (OBP) and Time of Day (ToD) Prom chips.

Caution – If the LED subtest is selected, please be aware that LEDs on the blade will change. They will return to their correct state when the test is completed.

`bsctest` Options

To reach the dialog box below, right-click on the test name in the System Map and select Test Parameter Options. If you do not see this test in the System Map, you might need to expand the collapsed groups, or your system may not include the device appropriate to this test. Refer to the *SunVTS User's Guide* for more details.

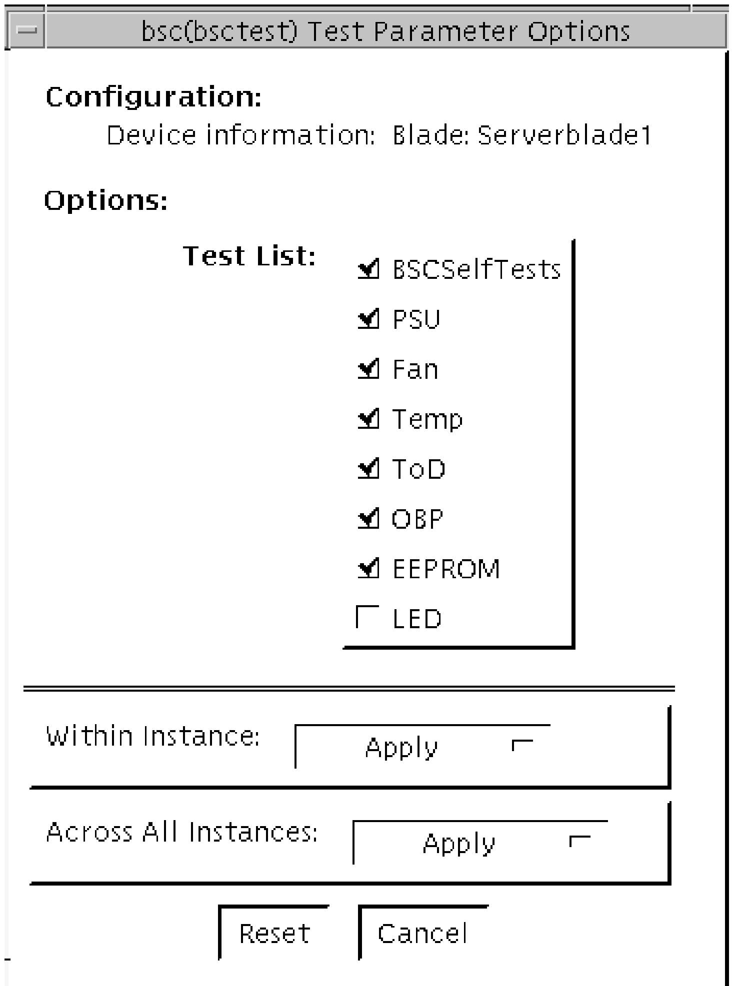


FIGURE 4-1 `bsctest` Test Parameter Options Dialog Box

TABLE 4-1 `bsctest` Options

`bsctest` **Options**	**Description**
BSCSelfTests	Calls on the BSC to execute its built-in self tests.
PSU	Performs read-only checks of Power Supply status.
Fan	Performs read-only checks of Fan status.
Temp	Performs read-only checks of Temperature Monitor status.
ToD	Performs read-only checks of Time of Day chip.

TABLE 4-1 `bsctest` Options *(Continued)*

`bsctest` **Options**	**Description**
OBP	Performs read-only checks of platform specific Open Boot properties.
EEPROM	Performs read-only check of EEPROM.
LED	Performs read-only check of Service Required LED status and performs a test in which all three LEDs (Power, Service Required, and Ready to Remove) are flashed simultaneously at 4Hz and then returned to their original state.

`bsctest` Test Modes

TABLE 4-2 `bsctest` Supported Test Modes

Test Mode	**Description**
Connection	Opens the BSC, OBP, and ToD devices.
Functional	Performs all tests with the LED testing off by default.
Online	Performs all tests except BSCSelfTests and LED *Flashing* test.

`bsctest` Command-Line Syntax

`/opt/SUNWvts/bin/bsctest` *standard_arguments* **`[-o dev`**=*device_name* **`test`**=<*test_list*>**`]]`**

TABLE 4-3 `bsctest` Command-Line Syntax

Argument	**Description**
`dev=`*device_name*	*device_name* is the device to be tested, for example, `bsc`
`test`=*test_list*	*testlist* is the list of subtests, for example: `BSCSelfTests`, `PSU`, `Fan`, `Temp`, `ToD`, `OBP`, `EEPROM`, `LED`

Note – 64-bit tests are located in the `sparcv9` subdirectory: `/opt/SUNWvts/bin/sparcv9/`*testname*, or the relative path to which you installed SunVTS. If a test is not present in this directory, then it might be available as a 32-bit test only. For more information, see "32-Bit and 64-Bit Tests" on page 5.

CHAPTER 5

Optical Disk Drive Test (`cddvdtest`)

`cddvdtest` verifies the functionality of optical disk drives.The `disktest` probe detects the media type in the drive and shows the test options for the media found. If inserted media is not supported by the drive, the `disktest` probe shows an error and registers options for CD-ROM as default.

Note – `cddvdtest` is a newly consolidated test which is used to test the optical media drives such as the CD-ROM, DVD-ROM and CD-DVD-RW drives. `cddvdtest` supports the same set of options for both SPARC and x86.

Volume Management

`cddvdtest` tests the optical drive(s) even if the Volume Manager is not running. If the Volume Manager is running and no media is installed in the drive(s), SunVTS prompts you to install media in the drive before selecting the test. The test fails if you try to run it without media in the drive.

Note – When testing rewritable media, the media can be either blank or contain the SunVTS test data. When testing the write-once media, the media (such as CD-R) has to be blank at the start to run the write test. Such media could still run multiple passes of the test because after the first write test, the subsequent invocations will treat the media as Read Only and perform the test accordingly.

For CD-ROM and DVD-ROM drives, the test checks the unit by reading either the CD or DVD. For CD-ROM, each track is classified as follows:

- Mode 1 uses error detection/correction code (288 bytes).
- Mode 2 uses that space for auxiliary data or as an audio track.

For rewritable CD media, the test can write one or more tracks in one test pass. `cddvdtest` writes tracks on next available space on the media. If the media is full, `cddvdtest` automatically erases the whole media and starts the next test pass from the beginning of the media.

For rewritable DVD media, the test writes only one track in one test pass (because there is only one track in DVD format). `cddvdtest` blanks the media when starting the test, if the media is not already blank.

For rewritable media types, the test verifies write, read, and other supporting functions of CD and DVD RW drives. The supported media include the following:

- CD-R (must be blank)
- CD-RW (can either be blank or contain the SunVTS test data)
- DVD-R (must be blank)
- DVD+R (must be blank)
- DVD-RW
- DVD+RW

Note – `cddvdtest` is not a scalable test.

`cddvdtest` Hardware and Software Requirements

`cddvdtest` has different set of test requirements based on the media type as described below.

CD-ROM and DVD-ROM

The drive must have the appropriate CD-ROM or the DVD-ROM media before performing the test.

When a CD-ROM is loaded in the drive, `cddvdtest` uses CD-ROM specific options to test the drive. When a DVD-ROM is loaded, the test uses DVD-ROM specific options. Whenever you change the media in the drive you must perform a reprobe (refer to the *SunVTS User's Guide* for details) so the SunVTS kernel associates the correct test options based on the media that is loaded in the drive.

CD-RW and DVD-RW

When testing rewritable media, reprobing is required if the media is changed. To prevent accidentally erasing useful data on a media used for testing, cddvdtest accepts the test media only if it is blank or it contains SunVTS test data (data that is written by `cddvdtest` itself). The test checks these conditions at probe time and at the start of test.

In case of non-blank media OR the media with non-SunVTS test data, the media must be blanked first by using the `cdrw` utility. Because -R or +R media can be written only once, only a blank media should be used for write testing. Such media could still run multiple passes of the test because after the first write test, the subsequent invocations will treat the media as Read Only and perform the test accordingly.

To prevent media corruption, if stopped during a write, finalize, format, or erase, the test posts a Warning message and continues until the current operation is completed. Wait until the test completes before doing any operation on the drive.

Do not stop the test in the middle of a writing operation. Doing so may cause damage to the media in some cases. It is better to set a limited number of passes for `cddvdtest`, instead of setting Max Passes=0 (unlimited) and stop the test manually. If a media is damaged, you should blank the media with `cdrw` command.

Note – DVD+RW media can not be blanked.

The default Delay between two passes for the Read Write media is three minutes. This setting is intended to make the test run less passes in long hours testing to preserve the media. It is also intended to give plenty of time to stop the test between passes.

`cddvdtest` Subtests

`cddvdtest` has different subtests based on the media type as described below.

CD-RW and DVD-RW

TABLE 5-1 `cddvdtest` Subtests for CD-RW and DVD-RW Media

Subtest	Description
Blank	Erases data on DVD-RW media and CD-RW media if not blank. This subtest does not apply to DVD+RW media because this media type can not be blanked.
Simulation	Performs a write track with Laser turned off. This mode tests writing function without data written to the media.
Write	Writes to media with predefined data patterns of 0..ff hex. For CD-RW media, track can be specified as data or audio track.
Read	Reads the written data.
Compare	Compares write/read data, reports failure if miscompared.
Read Disk/Track	Reads and shows Disk Table of Content (TOC).
Eject	Ejects media.

`cddvdtest` Options

To reach the dialog boxes below, right-click on the test name in the System Map and select Test Parameter Options. If you do not see this test in the System Map, you might need to expand the collapsed groups, or your system may not include the device appropriate to this test. Refer to the *SunVTS User's Guide* for more details.

`cddvdtest` has different test options based on the media type as described below.

CD-ROM Test Options

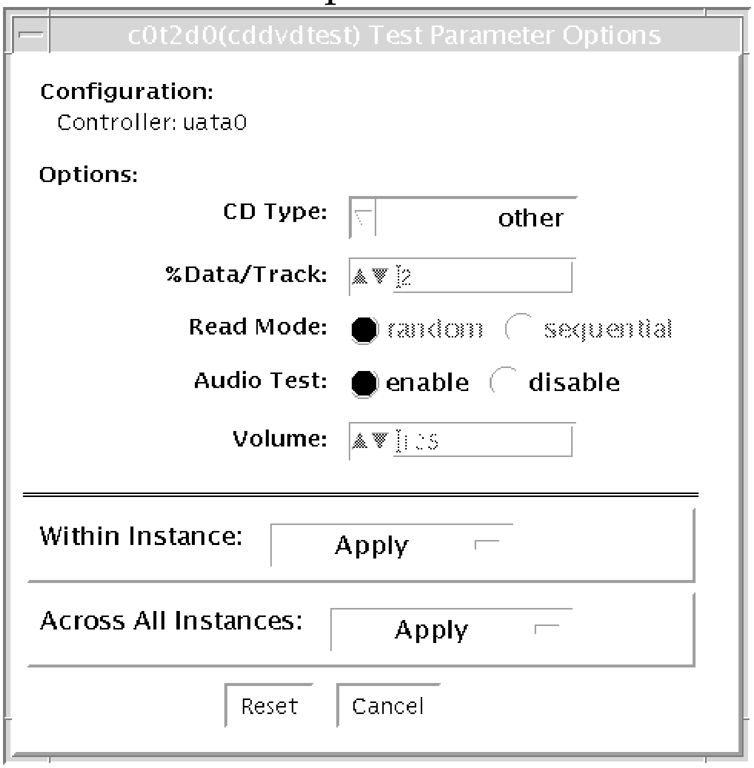


FIGURE 5-1 `cddvdtest` Test Parameter Options Dialog Box for CD-ROM

TABLE 5-2 `cddvdtest` Options for CD-ROM

Option	Description
CD Type	The types of compact discs that can be tested are listed in the CD Type menu. The choices are: pdo, multi-session, or other the default CD type is other). In the Connection test mode, this option has a default value of other. Note - Your choice must correspond with the disc used for testing.
% Data/Track	Tests a percentage of data on each track. Type a value between 0 and 100 in this field to indicate the percentage. In the online and connection tests this option has a canned value of 2%.
Read Mode	cddvdtest reads the CD either in Random or Sequential mode. In Random mode, data blocks are read from random track positions; in Sequential mode, data blocks are read in sequence. For both modes, the total number of blocks read is determined by the %_of_data option. In the online and Connection tests this option has a canned value of random.
Audio Test	Enables or disables the audio test. You must connect headphones or a speaker to the audio jack on the CD player to hear audio output. In the Connection test, this option has a default value of disable.
Volume	Adjusts the volume. Type a value between 0 and 255 in this field. In the online and connection tests this option has a default value of 125.

DVD-ROM Test Options

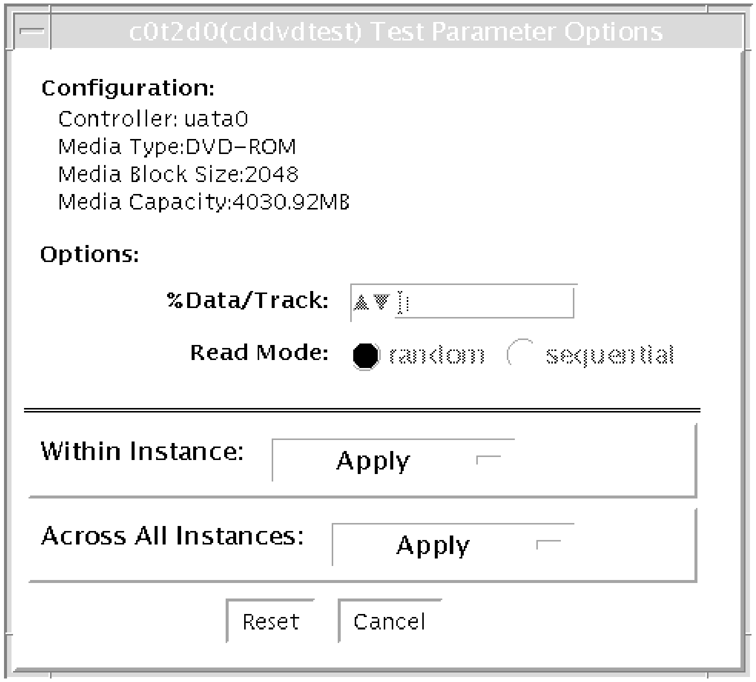


FIGURE 5-2 `cddvdtest` Test Parameter Dialog Box for DVD-ROM

TABLE 5-3 `cddvdrwtest` options for DVD-ROM

Option	Description
% Data/Track	Specifies a percentage of data to test for each track. Use a number between 0 and 100.
Read Mode	Specifies either Random or Sequential mode. Random mode reads data blocks from random track positions. Sequential mode reads data blocks in sequence. For both modes, the total number of blocks read is determined by the % Data/Track value.

CD-RW Test Options

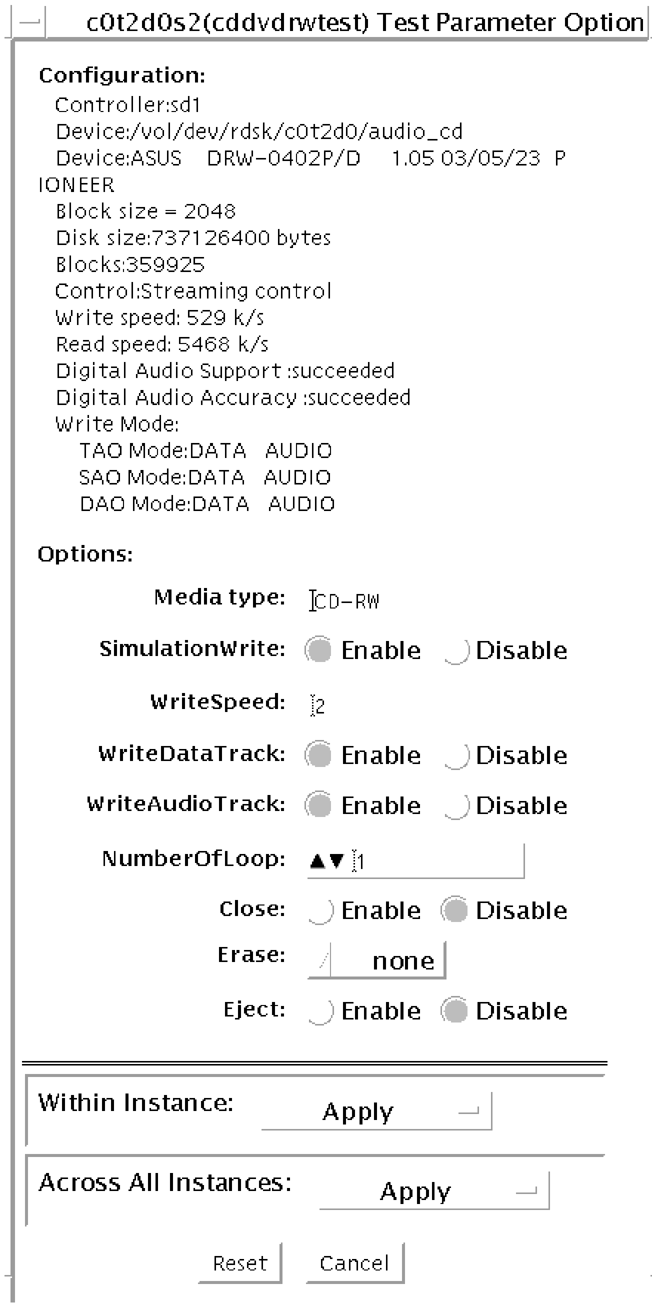


FIGURE 5-3 cddvdtest Test Parameter Options Dialog Box for CD-RW

TABLE 5-4 cddvdtest Options for CD-RW

Option	Description
SimulationWrite	Disable/Enable Simulation Write
WriteSpeed	Speed entered in terms of `nX`. Speed will be set to closest approximation of *nX* allowed by device.
WriteDataTrack	Write a Data Track in one Test Loop
WriteAudioTrack	Write an Audio Track in one Test Loop
NumberOfLoop	Number of loop in one test pass comprising Data and Audio Track if enabled.
Close	Close after writing. Can not write more track on media.
Erase None	No erase All: Erase whole disk
Eject	Eject the disk when test completed. Do not enable this option in a multiple pass test session.

DVD-RW Test Options

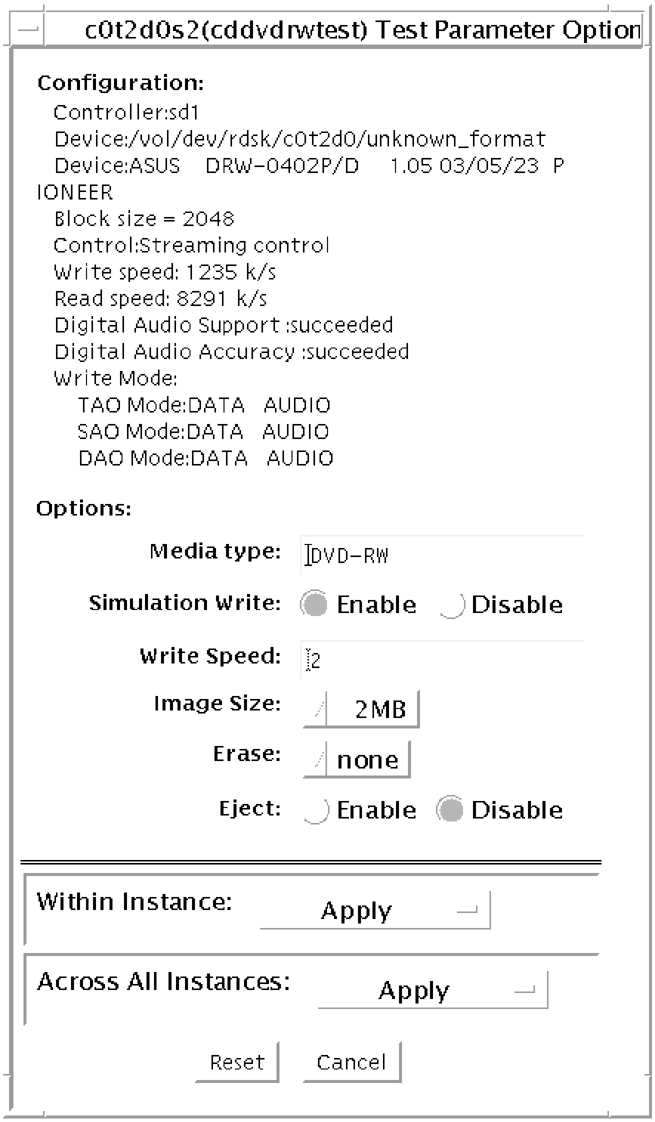


FIGURE 5-4 `cddvdtest` Test Parameter Options Dialog Box for DVD-RW

TABLE 5-5 `cddvdtest` Options for DVD-RW

Options	Description
SimulationWrite	Disable/Enable Simulation Write
WriteSpeed	Speed entered in term of `nX`. Speed will be set to closest approximation of `nX` allowed by device.
ImageSize	Track Size, how much data is written: 2MB, 10MB, 2GB, 4GB
Erase None	No erase
Fast	Erase with "fast" option. Only Table of Content is erased
All	Erase with "all" option. Erase whole disk surface.
Eject	Eject the disk when test completed. Do not enable this option in a multiple pass test session.

`cddvdtest` Supported Test Modes

This test supports Connection and Functional test modes for all media types. The test behavior in each mode for the different media types is explained below.

CD-ROM Test Modes

TABLE 5-6 Supportted Test Modes for CD-ROM

Test Mode	Description
Connection	In this mode, `cddvdtest` verifies that a CD-ROM drive is connected to and configured in the system.
Functional	In this mode, the test registers a failure if the device is found to be busy. This is because SunVTS tests make the assumption that all the resources will be available for testing in the Functional test and the unavailability of a device is interpreted as an indication of a fault condition.

DVD-ROM Test Modes

TABLE 5-7 Supported Test Modes for DVD-ROM

Test Mode	Description
Connection	Requests and displays information from the drive and reads two blocks of data from the media to confirm connectivity. An error is reported if no media is loaded in the drive.
Functional	Requests and displays information from the drive, then reads data from the media based on the options that are set in the Test Parameter Options Dialog Box. An error is reported if no media is loaded in the drive.

CD-RW and DVD-RW Test Modes

TABLE 5-8 Supported Test Modes for CD-RW and DVD-RW

Test Mode	Description
Connection	Shows basic drive information and supporting modes. Shows disk Table of Content (TOC)
Functional	The following subtests are done in sequence:Erase - Erases data if DVD-RW media is not blank, or CD-RW media if full. • Simulation (optional) - Performs a write track with Laser turned off. This mode tests writing function without data written to the media. • Write - Writes to media with predefined data patterns of 0..ff hex. For CD media track can be specified as data or audio track. • Read - Reads the written data • Compare - Compares write/read data, reports failure • if miscompared. • Blank media (optional) • Read Disk/Track - Reads and shows Disk Table of Content. • Eject (optional)

`cddvdtest` Command-Line Syntax

`cddvdtest` has different command line syntax based on the media type as described below.

CD-ROM Command-Line Syntax

/opt/SUNWvts/bin/sparcv9/cddvdtest *standard_arguments* **-o dev**= *raw_device_name*, mode=*mode*, read=random|sequential, data=*%_of_data*, vol= *volume*, audio=enable|disable, type=*CD_type*

TABLE 5-9 CD-ROM Command-Line Syntax

Argument	Description
dev=*raw_device_name*	Specifies the name of the raw device to be tested.
read=*random|sequential*	Indicates random or sequential read access.
data=*%_of_data*	Sets the percentage of data to be tested. You can specify 0 to 100 percent.
vol=*volume*	Controls the audio volume. You can specify 0 through 255; the default is 255.
audio=*enable|disable*	Enables or disables the audio test. You must connect headphones or a speaker to the audio jack on the CD player to hear audio output.
type=*CD_type*	Specifies the type of CD used for the test. The choices are: pdo, multi-session, sunos and other; the default is other.

DVD-ROM Command-Line Syntax

/opt/SUNWvts/bin/sparcv9/cddvdtest *standard_arguments* -o dev= *device_name*, read=random|sequential, data=*%_of_data*

TABLE 5-10

Argument	Description
dev=*device_name*	Specifies the name of the device to test, for example /dev/rdsk/cntndn.
read=random|sequential	Indicates random or sequential read access.
data=%_of_data	Sets the percentage of data to test. Use a number from 0 to 100.

CD-RW Command-Line Syntax

`/opt/SUNWvts/bin/sparcv9/cddvdtest` *standard_arguments* `-o dev=`*cntndnsn*, `media=CD-RW`, `nosim`, `speed=`*n*, `nodata`, `noaudio`, `loop=`*n*, `close`, `erase=`{`none`, `all`}, `eject`

TABLE 5-11 CD-RW Command-Line Syntax

Argument	Description
`dev=`*cntndnsn*	Specifies the device under test.
`media=CD-RW`	Specifies media.
`nosim`	Disables Simulation Write
`speed=`*n*	Specifies the speed entered in terms of *nX*.
`nodata`	Disables Data Track test.
noaudio	Disables Audio Track test.
`loop=`*n*	Specifies 1 to 40, the number of loops in one test pass.
close	Closes track after test after the test, no track can be added.
`erase=`{`none`, `all`}	`none` - Do not erase media after test complete. `all` - Erase entire disk.
`eject`	Ejects disk after test completed.

DVD-RW Command-Line Syntax

`/opt/SUNWvts/bin/sparcv9/cddvdtest` *standard_arguments* `-o dev=`*cntndnsn*, `media=`{`DVD-RW`, `DVD+RW`}, `nosim`, `speed=`*n*, `imagesize=`{2MB,10MB,2GB,4GB}, `erase=`{`none`, `fast`, `all`}, `eject`

TABLE 5-12 DVD-RW Command-Line Syntax

Argument	Description
`dev=`*cntndnsn*	Specifies the devise under test.
`media=`{`DVD-RW`, `DVD+RW`}	Specifies media.
`nosim`	.Disables Simulation Write
`speed=`*n*	.Specifies the speed entered in terms of *nX*.

TABLE 5-12 DVD-RW Command-Line Syntax *(Continued)*

Argument	Description
imagesize={2MB,10MB,2GB,4GB}	.Specifies the image size used in write/read test
`erase`={`none`, `fast`, `all`}	.`none` - Do not erase media after test complete `fast` - Erase the last track added `all` - Erase entire disk
`eject`	Ejects the media.

CHAPTER **6**

Chip Multi-Threading Test (cmttest)

cmttest verifies the proper functioning of the multiprocessor hardware with multiple cores in one CPU. cmttest tests the path between the cores on the same CPU in addition to performing CPU specific testing. cmttest uses the Cache Coherence, Shared Memory, and RAM subtests. The Cache Coherence subtest is used to test the coherence among all of the Cores in a CMT (Chip Multiprocessor). The Shared Memory subtest is used to test the shared memory among all the cores in a CMT. The RAM subtest is used to test the memory. The RAM subtest covers TLB, MMU, and bus balancing.

Only one cmttest is registered and cmttest is present under the logical name Processor(s). There is no physical name provided. The probe routine of cmttest probes all CMTs in which at least two cores are online.

cmttest was named cmptest in previous SunVTS releases.

cmttest Options

To reach the dialog box below, right-click on the test name in the System Map and select Test Parameter Options. If you do not see this test in the System Map, you might need to expand the collapsed groups, or your system may not include the device appropriate to this test. Refer to the *SunVTS User's Guide* for more details.

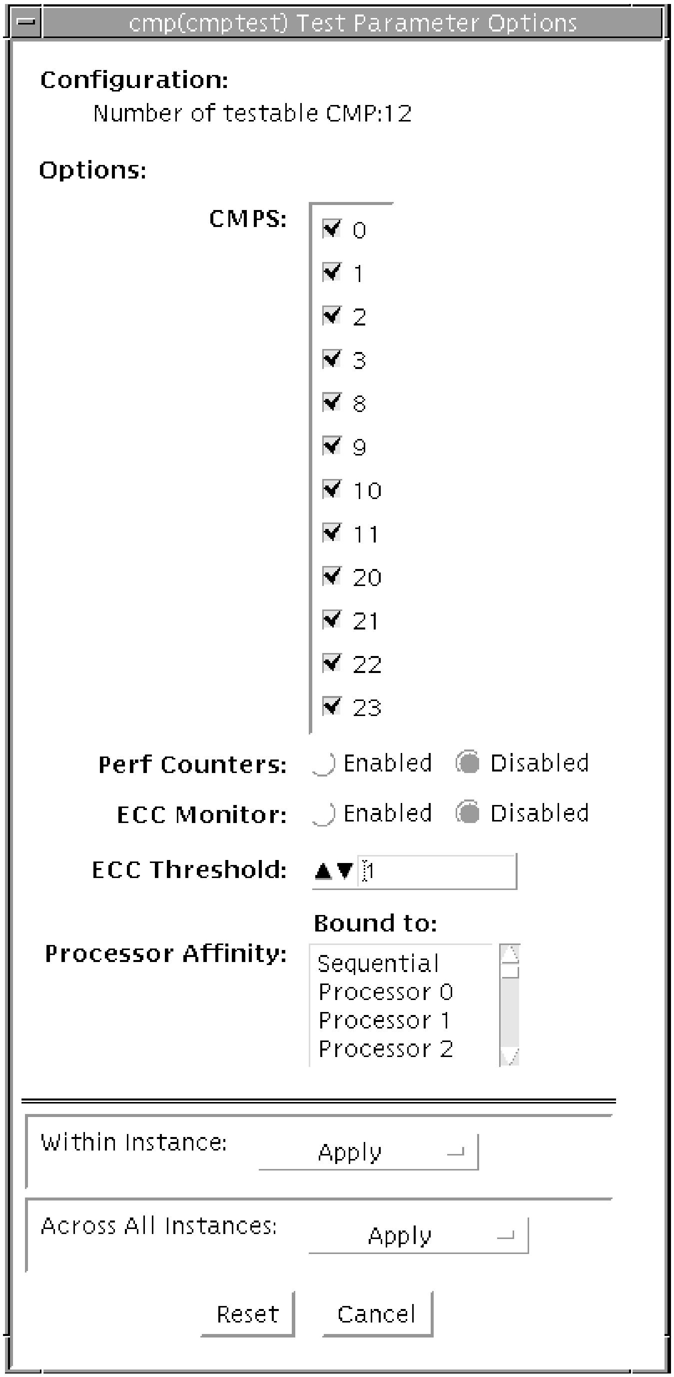


FIGURE 6-1 `cmttest` Test Parameter Options Dialog Box

The processors that can be tested are listed in the Configuration area of the menu. You can enable or disable the multiprocessing test for individual processors on this menu.

The options listed in the following table can be run alone or concurrently with other options.

TABLE 6-1 `cmttest` Options

`cmttest` **Options**	**Description**
CMTS	You can test specific CMTs by clicking Select on the check boxes to enable or disable each CMT. A check mark indicates the CMT is enabled for testing. The default setting is all CMTs enabled.
Perf Counters	By default performance monitoring is "Disabled". When performance monitoring is "Enabled" tests print memory bandwidth achieved while testing. Right now only ram subtest has the counters built in. Bandwidth calculations assume that all banks corresponding to all cpus are present and had same number of reads and writes. (Note: Perfcounter monitoring can be done on SUNW,UltraSPARC-IV processors, If user tries to enable perfCounter, and perfcounters are not supported ,on cpus the appropriate warning message is displayed, with disabling the perfcounter.)
ECC Monitor	This option is used to Enable or Disable ECC error monitoring. The default option is Disabled.
ECC Threshold	Range is [0-255].This determines how many correctable ECC errors occurred in the elapsed time before cmttest reports a test failure. The default threshold value is 1.

`cmttest` Test Modes

TABLE 6-2 `cmttest` Supported Test Modes

Test Mode	Description
Functional	The Functional test mode is supported.
Exclusive	Performs the full test.

`cmttest` Command-Line Syntax

For 32-bit configurations:

`/opt/SUNWvts/bin/cmttest` *standard_arguments*
`-o cmts=`*0+1+2...*, **`em=`***Enabled | Disabled*, **`threshold=`***[0-255]*, **`perf=`**
Enabled | Disabled

For 64-bit configurations:

`/opt/SUNWvts/bin/sparcv9/cmttest` *standard_arguments*
`-o cmts=`*0+1+2...*, **`em=`***Enabled | Disabled*, **`threshold=`***[0-255]*, **`perf=`**
Enabled | Disabled

TABLE 6-3 `cmttest` Command-Line Syntax

Arguments	Description
`cmts=`*0+1+2...*	*0, 1, 2,...* mentions the CPU ID of any one Core of the CMTs to be tested. To display on GUI, CPU ID of Core 0 will be taken as the identifier for a CMT. For displaying the Error/INFO/LOG messages, the CPU ID of the core 0 is used.

TABLE 6-3 `cmttest` Command-Line Syntax

Arguments	Description
em=*Enabled | Disabled*	This option is used to Enable or Disable ECC error monitoring. The default value is Disabled.
threshold=*[0-255]*	The range is [0-255]. This determines how many correctable ECC errors can occur in the elapsed time before `cmttest` reports a test failure. The default value is 1.
perf=*Enabled | Disabled*	By default performance monitoring is *Disabled*. When performance monitoring is *Enabled* tests print memory bandwidth achieved while testing. Only the RAM subtest has the counters built in. Bandwidth calculations assume that all banks corresponding to all CPUs are present and have the same number of reads and writes. Note: Perfcounter monitoring can be done on SUNW, UltraSPARC IV processors. If you try to enable perfCounter, and the perfcounters are not supported on the CPUs, the appropriate warning message is displayed and the perfcounter is disabled.

Note – 64-bit tests are located in the `sparcv9` subdirectory: `/opt/SUNWvts/bin/sparcv9/`*testname*, or the relative path to which you installed SunVTS. If a test is not present in this directory, then it might be available as a 32-bit test only. For more information, see “32-Bit and 64-Bit Tests” on page 5.

CHAPTER 7

CPU Power Management Test (cpupmtest)

cpupmtest cycles a CPU through its Power Management™ states. The CPU is run for user-defined periods of time from full speed, to half speed, to lowest speed, back up to half speed, and to full speed, in that order, at various levels. cpupmtest test verifies that the CPU speed changes correctly for each state.

You can also run this test concurrently with device tests, to monitor whether CPU speed changes are affecting device performance. Use cpupmtest to check that all devices function correctly during different Power Management modes.

Note – The number of speed levels available for testing depends on the type of CPU being tested, Enter an appropriate number of arguments for your CPU: speed1, speed2 .. speedn, where speed1 is the CPU's lowest speed and speedn is the CPU's highest speed.

---

cpupmtest is currently supported on Sun Blade™ 100 and Sun Blade 1000 systems.

Note – SunVTS does not support processor sets. If processor sets are defined, you must first delete the processor sets before running SunVTS.

---

cpupmtest Options

To reach the dialog box below, right-click on the test name in the System Map and select Test Parameter Options. If you do not see this test in the System Map, you might need to expand the collapsed groups, or your system may not include the device appropriate to this test. Refer to the *SunVTS User's Guide* for more details.

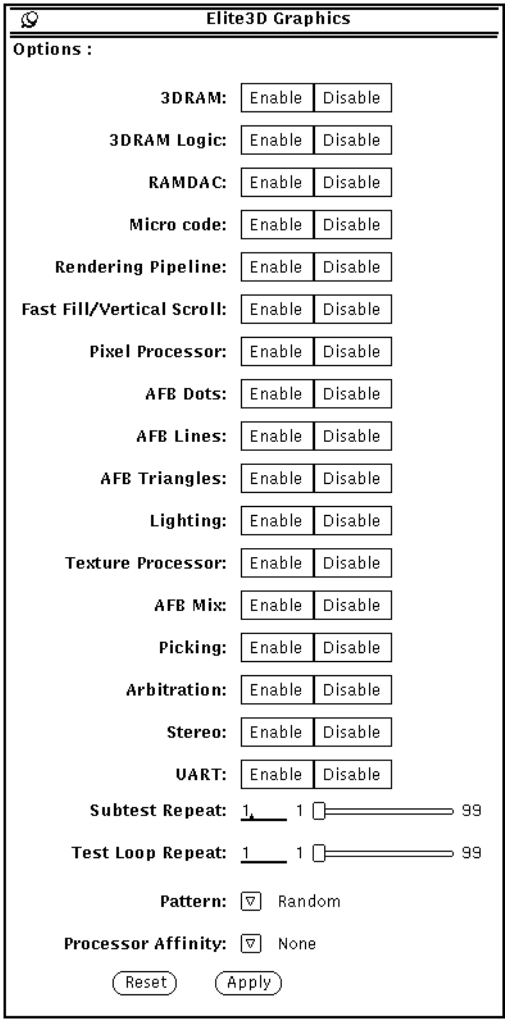


FIGURE 7-1 cpupm`test` Test Parameter Options Dialog Box

Note – Your system may display a different number of levels in the dialog box, as the number of available levels depends on the type of CPU being tested.

TABLE 7-1 `cpupmtest` Options

Option	Description
Level1	Sets the number of minutes to test the system at its lowest speed.
Level2	Sets the number of minutes to test the system at a level higher than the lowest speed.
Level3	Sets the number of minutes to test the system at a level higher than Level2 speed.
Level<n-1>	Sets the number of mnutes to test the system at a level lower than the normal speed.
Level<n>	Sets the number of mnutes to test the system at its normal speed.
Log Power States	Records and timestamps every CPU power level change to the VTS log file (`/var/opt/SUNWvts/logs/sunvts.info`).

`cpupmtest` Test Modes

TABLE 7-2 `cpupmtest` Supported Test Modes

Test Mode	Description
Exclusive	Runs the full test.

`cpupmtest` Command-Line Syntax

/opt/SUNWvts/bin/cpupmtest *standard_arguments*
-o dev=*cpupm***,speed1=***mn***,speed2=***mn***,speed***n***=***mn*

TABLE 7-3 `cpupmtest` Command-Line Syntax

Argument	Description
dev=*cpupm*	Specifies the name of the device.
speed1=*mn*	Sets the number of minutes to test the system at its lowest speed.
speed2=*mn*	Sets the number of minutes to test the system at the next level of speed.
speed*n***=***mn*	Sets the number of minutes to test the system at its highest speed.

CHAPTER 8

CPU Test (`cputest`)

The `cputest` checks specific aspects of SPARC V9 processor datapath functionality.

Note – `cputest` does support x86 platforms that use the Solaris operating system.

The `cputest` comprises of two subtests:

- g0 subtest—tests a processor's g0 register functionality. The g0 subtest is only supported on UltraSPARC-based systems. This subtest is not supported on x86 platforms.
- CUC subtest—tests a processor's ability to correctly execute a Compress/Uncompress/Compare (`cmp`) command sequence on machines with the SPARC-V9 architecture.
  As the CUC subtest runs, it creates four files in the `/tmp/sunvts` directory. The CUC subtest uses the following file naming conventions where *nnn* represents the processor unit number and *x* represents a random character string appended to the file name:
  - `P`*nnn*`P`*x*— original pattern file (size determined by the `cputest` File Size option)
  - `P`*nnn*`Z`*x*— compressed version of the pattern file
  - `P`*nnn*`U`*x*— uncompressed data from the `P`*nnn*`Z`*x* file
  - `PnnnC`*x*— comparison data between the `P`*nnn*`P`*x* and `P`*nnn*`U`*x* files

With the `cputest` file retention mode, you can control whether these files are deleted or not, so that in the event of a miscompare, you can view the contents of the files to analyze the miscompared data. The exact names of the files are displayed in the SunVTS message window whenever the files are saved such as when there is a compression miscompare or when the file retention mode is set to save. Refer to "`cputest` Options" on page 58 for more details.

Caution – Do not run the CUC subtest with the retention mode set to `save` for numerous passes, otherwise the files that are saved in `/tmp/sunvts` can fill the `/tmp` capacity. If `/tmp` is mounted to the swap area, the swap space may become filled to capacity.

Note – Only one instance of `cputest` per processor is possible.

Note – When `cputest` is run with other tests, it may give the error message "exec'd program compress failed with code 1". This can be an indication of a failed compression program, not necessarily a failed CPU. If this occurs, stop all other tests and run `cputest` alone. If the message occurs again, the CPU is failing.

Note – The `cputest` only runs on SPARC V9 systems.

Note – SunVTS does not support processor sets. If processor sets are defined, you must first delete the processor sets before running SunVTS.

`cputest` Options

To reach the dialog box below, right-click on the test name in the System Map and select Test Parameter Options. If you do not see this test in the System Map, you might need to expand the collapsed groups, or your system may not include the device appropriate to this test. Refer to the *SunVTS User's Guide* for more details.

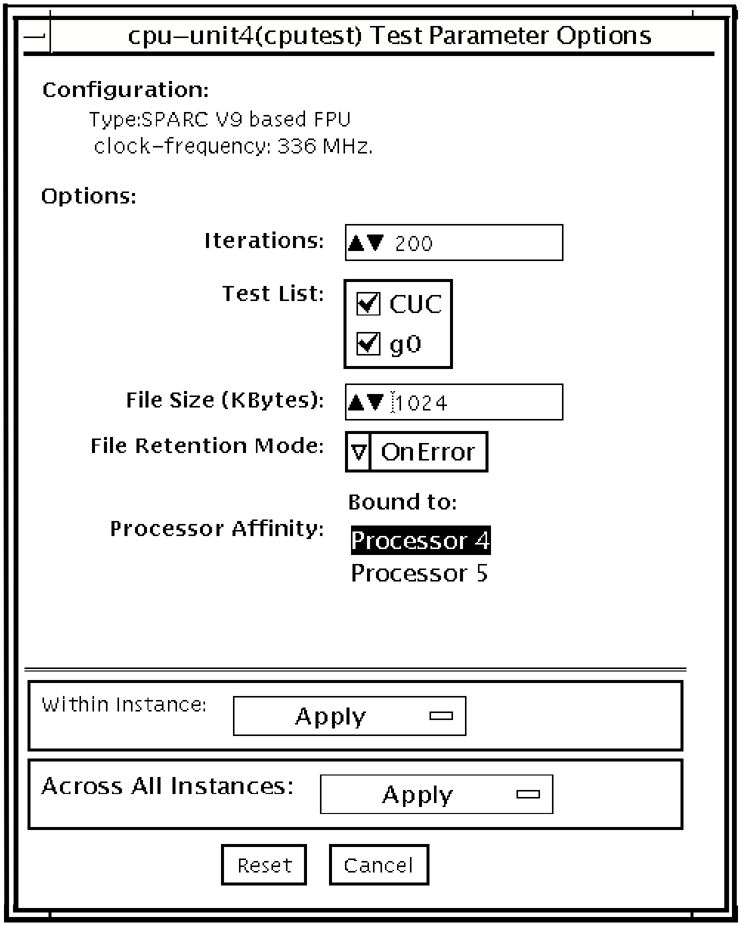


FIGURE 8-1 `cputest` Test Parameter Options Dialog Box

TABLE 8-1 `cputest` Option Dialog Box Descriptions

Option	Description
Iterations	Specifies the number of times to loop on the selected subtests. Use the up/down arrows to select a value from 1 to 8192. The default varies depending on the SunVTS test mode.
Test List	Specifies which subtests to run. The choices are: • CUC—the compress/uncompress/compare subtest. • g0—the g0 register subtest. Note g0 is not supported on x86 platforms. Refer to the general test description at the beginning of this chapter for subtest descriptions. If no subtest is selected, both subtests run.
File Size (KBytes)	Specifies the size of the CUC pattern file in KBytes. Select a value from 1 to 8192. The default varies depending on the SunVTS test mode.
File Retention Mode	Specifies whether the `cputest` removes the CUC pattern files or not. The choices are: • Purge—unconditionally removes the four subtest files. • Save—does not remove any of the four subtest files. • OnError—removes the four subtest files unless the CUC resulted in a miscompare. In this case, do not remove the files. The default is OnError. Refer to the Caution at the beginning of this chapter regarding the Save value.
Processor Affinity	Although the test parameter dialog box displays the processor affinity "bound to" selection box, the processor that corresponds to this instance of the `cputest` is determined when the SunVTS kernel probes for devices. Therefore, switching processor affinity in this dialog box is not supported.

`cputest` Test Modes

The following table describes how the `cputest` functions in the different test modes.

TABLE 8-2 `cputest` Supported Test Modes

Test Mode	Description
Connection	Both subtests are selected. The test options are fixed with the following values: • Iterations=5 • File Size=64 KBytes • File retention=OnError
Functional (Offline)	Both subtests are selectable, and all the test options are available to scale the `cputest` as needed.
Online	Supported

`cputest` Command-Line Syntax

/opt/SUNWvts/bin/`cputest` *standard_arguments* **-o dev=***device_name***,count=***count_number***,test=***testlist***,size=***file_size*
,retain=*mode*

TABLE 8-3 `cputest` Command-Line Syntax

Argument	Description
dev=*device_name*	Specifies the name of the device to test, for example, `cpu-unit5`
count=*count_number*	Defines the number of times to loop on the subtests. Use a number from `1` to `8192`. The default is `200`.

TABLE 8-3 `cputest` Command-Line Syntax *(Continued)*

Argument	Description
`test=`*testlist*	Specifies which subtests to run. The choices are: • `CUC` • `g0` • `CUC+g0`
`size=`*file_size*	Specifies the size of the CUC pattern file in KBytes. Select a value from `1` to `8192`. The default is `1024`.
`retain=`*mode*	Specifies whether the `cputest` removes the CUC pattern files or not. The choices are: • `Purge`—unconditionally remove the four subtest files • `Save`—do not remove any of the four subtest files • `OnError`—remove the four subtest files unless the CUC resulted in a miscompare. In this case do not remove the files. The default is `OnError`. Refer to the Caution at the beginning of this chapter regarding the `Save` value.

Note – 64-bit tests are located in the `sparcv9` subdirectory: `/opt/SUNWvts/bin/sparcv9/`*testname*, or the relative path to which you installed SunVTS. If a test is not present in this directory, then it might be available as a 32-bit test only. For more information, see "32-Bit and 64-Bit Tests" on page 5.

CHAPTER **9**

Disk and Floppy Drives Test (`disktest`)

`disktest` verifies the functionality of hard drives and diskette drives using three subtests (see TABLE 9-1): Media, File System, and Asynchronous I/O.

Note – `disktest` does support x86 platforms on Solaris.

Most disk drives, such as SCSI disks, native or SCSI floppy disks, IPI, and so on, are supported. The type of drive being tested is displayed at the top of the Test Parameter Options dialog box.

Note – `disktest` is supported on x86 platforms that use the Solaris operating system for the Read-Only mode only. None of the WriteRead or the File System related tests are supported on x86 at this time. For disks on x86 machines, the disk partitions could range from 0 to 15. `disktest` can be performed on any of these selected partitions.

The `disktest` Test Parameter Options dialog box shows all the partitions that are available for testing. The file System subtest can only be run if the selected partition is mounted (described below). The WriteRead option of the Media subtest is allowed only if a selected partition is *not* mounted.

disktest Test Requirements

By default, disktest does not mount any partitions. To have SunVTS pre-mount all mountable partitions, set the environment variable BYPASS_FS_PROBE to 0 (zero) before starting SunVTS. Pre-mounting can be disabled by unsetting BYPASS_FS_PROBE or changing it to a value other than 0 (zero).

The mount point used by disktest is the word *disktest* appended by the name of the disk partition. For example, if the disk partition name is /dev/dsk/c0t3d0s0, disktest mounts it as superuser under the name /disktest_c0t3d0s0.

Caution – If a power failure occurs OR if the disktest is terminated abruptly while the Media subtest is running in WriteRead mode, disk data may be corrupted.

Caution – Running the Media subtest on a disk partition in the WriteRead mode may cause data corruption if the same partition is being used by other applications. Please run SunVTS in the offline mode only when there are no other applications running.

---

disktest tests the floppy drive regardless of whether the Volume Management software is running or not. The following mount point names are used:

- If the Volume Management software *is* running, disktest tests the disk drive with the mount point name in the /etc/mnttab file.
- If the Volume Management software *is not* running, disktest tests the disk drive with the device name dev=/dev/diskette. Do not edit the /etc/vold.conf file to change the diskette drives. Currently, the SunVTS software is hard-coded to use these path names as the default logic names.

Loading an option file (refer to the *SunVTS User's Guide* for option file details) that was created when BYPASS_FS_PROBE was set to 0 (zero) might not work if the BYPASS_FS_PROBE environment variable is no longer set to 0. Testing may fail with the following error:

```
SUNWvts.disktest.8088 07/24/98 15:47:22 disktest c0t0d0 FATAL:
“Couldn’t get file system information on /disktest_s0t0d0s0,
statvfs() system call failure error: No such file or directory.
```

This error is caused when SunVTS expects to use the predefined mount point names that are created when BYPASS_FS_PROBE is set to 0 (zero), but these mount points do not exist while BYPASS_FS_PROBE is not set to 0.

To use option files with `disktest`, create two separate option files for the two different states of the `BYPASS_FS_PROBE` environment variable.

When a large number of `disktest` instances are run in write/read mode, tests might fail with messages similar to the following.

```
03/22/03 03:33:40 ctech140 SunVTS5.1ps2: VTSID 8011 disktest.FATAL
c1t0d0: "Failed lock mtab semaphore. "semop" system call failure,
errmsg: Invalid argument." Probable_Cause(s): <disktest instances
exceeds system semaphore operation limitation (default system
limit for seminfo_semmnu = 30)><System software error>
Recommended_Action(s): <Add the line "set semsys:seminfo_semmnu=
0x100" to your /etc/system file and reboot the machine> <If the
problem persists, call your authorized Sun service provider.
```

To avoid this issue, add the following entry to the `/etc/system` file and reboot the system.

```
set semsys:seminfo_semmnu=0x100
```

`disktest` Subtests

The following table describes the `disktest` subtests:

TABLE 9-1 `disktest` Subtests

Subtest	Description
Media subtest	The Media subtest verifies the disk media by allowing users to run `disktest` in different modes such as ReadOnly, ReadCompare, and WriteRead. The Media subtest treats the disk partition as one large chunk of contiguous data. In the WriteRead mode, all instances of `disktest` communicate through a shared memory service to ensure that they do not overlay the same disk area at the same time. This avoids data corruption. Each of the above three modes could run two different methods of disk testings. These are Synchronous I/O and Asynchronous I/O. SyncIO: Test reads and writes data using Read/Write system calls in a sequential fashion until the specified percentage of media is covered. AsyncIO: Test reads and writes data using `aio` library calls such as `aioread()`, `aiowrite()` until the specified percentage of media is covered. `aiowait()` is used to synchronize `aio` operations.
File System subtest	The File system subtest is used to verify the disk file system integrity. It exercises mounted disk partitions carrying the file system. By default, the test only runs on system-mounted partitions, it does not pre-mount any additional partitions. If you want SunVTS to pre-mount all of the unmounted partitions which have a file system, you have to set the environment variable `BYPASS_FS_PROBE` to '0' (zero). The test creates two temporary files of the size specified by File System File Size, writes the data patterns and compares the two files against each other.
Self subtest	This test is run as part of the Media subtest. You can not enable or disable this subtest. It is performed in Functional test mode only. This subtest instructs the disk to run its internal diagnostics. A failure in the Self subtest indicates a hardware problem with the actual device under test.
Write/Read disk buffer subtest	This test is run as part of the Media subtest. You can not enable or disable this subtest. It is performed in Functional test mode only. This subtest verifies the Write/Read buffer for the disk. This subtest uses the pattern specified for the Media subtest or the default pattern to write a defined number of iterations to the Write/Read buffer. A failure in the Write/Read buffer subtest indicates a problem in the upstream component and not with the actual test disk.

disktest Test Options

To reach the dialog box below, right-click on the test name in the System Map and select Test Parameter Options. If you do not see this test in the System Map, you might need to expand the collapsed groups, or your system may not include the device appropriate to this test. Refer to the *SunVTS User's Guide* for more details.

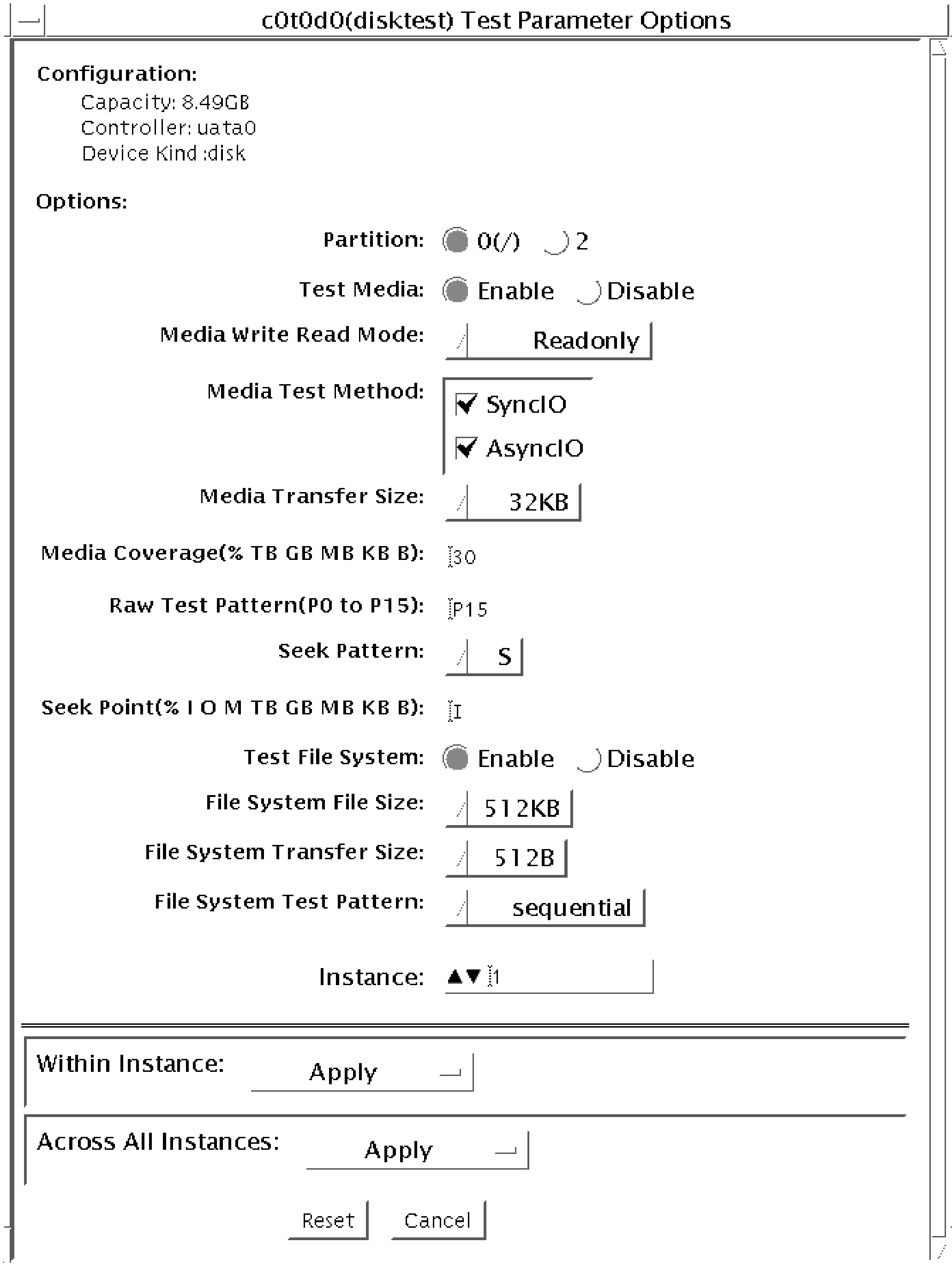


FIGURE 9-1 `disktest` Test Parameter Options Dialog Box

The following table describes the `disktest` option menu for different test modes.

TABLE 9-2 `disktest` Configurations and Options

`disktest` **Options**	**Description**
Partition	Displays the partition for the Media subtest. If a partition is mounted, its mount point is appended after the partition number, such as `1(/usr)`, where `1` is the partition number, and "`(/usr)`" is the mount point.
Test Media	Enable or Disable the media subtest.
Media Write Read Mode	Selects Read-Only or Compare after Read or Read after Write.
Media Test Method	Selects the Media Test Methods (SyncIO and AsyncIO).
Media Coverage (% TB, GB, MB, KB, B)	Enables users to test all or part of a partition (in percentage or in any of TB, GB, MB, KB, B units)
Raw Test Pattern (P0 to P15)	Enables user to specify the write, read pattern. P0 – Low Frequency Pattern P1 – Low Transition Density Pattern P2 – High Transition Density Pattern P3 – Compliant Jitter Pattern P4 – Compliant Jitter: RPAT P5 – Compliant Jitter: CRPAT P6 – Compliant Jitter: JTPAT P7 – Compliant Jitter: CJTPAT P8 – Compliant Jitter: SPAT P9 – Compliant Jitter: CSPAT P10 – 8 Bit Cable Pattern P11 – 16 Bit Cable Pattern P12 – 8 Bit Xtalk Pattern P13 – 16 Bit Xtalk Pattern P14 – MFM Pattern P15 – Generic Test Patterns
Seek Pattern	Enables specifying the pattern of the disk head movement. S – Sequential SR – Sequential Reverse LS – Low Power Sequential R – Random LB – Low Power Butterfly LR – Low Power Reverse Butterfly AB – Actuator Butterfly AR – Actuator Reverse Butterfly

TABLE 9-2 `disktest` Configurations and Options *(Continued)*

`disktest` **Options**	**Description**
Seek Point (%, I, O, M, TB, GB, MB, KB, B)	Enables specifying the seek point offset for the I/O. You can specify the offset in percentage or any of TB, GB, MB, KB, B or and I, M, O; that is, Initial, Middle), Outer.
Media Transfer Size	Displays the transfer size of the media subtest.
Test File System	Selects the File System subtest.
File System File Size	Specifies the size for each of the two temporary files for File System testing.
File System Transfer Size	Displays the transfer size of the File System subtest.
File System Test Pattern	Test pattern of File System subtest.
Connection Test for Hard Disk	• Option Menu for hard disk partition—0 - 7 [default] • Test Media—[Enable] (fixed to Enable) • Media Write Read Mode—[Read Only] (fixed to Read Only) • Media Test Method-[SyncIO] (fixed to SyncIO) • Media Coverage(%)—1 • Media Transfer Size—[2 KB] • Test File System—[Disable] (fixed to Disable)

TABLE 9-2 `disktest` Configurations and Options *(Continued)*

`disktest` **Options**	**Description**
Online Mode for Hard Disk	• Partition—0 - 7 [default] • Test Media—[Enable] [Disable] • Test Mode—[Read-only~] (fixed to Read-only) • Media Coverage (% TB GB MB KB B)—[10~] (fixed to 10%) • Media Transfer Size—[2KB~] (fixed to 2 KB) • Test File System—[Disable~] (fixed to Disable) Media Test Method—[SyncIO] [AsyncIO] Raw Test Pattern—[P15~] (fixed to P15) Seek Pattern—[S~] (fixed to S) Seek Point (% TB GB MB KB B)—[I~] (fixed to I)
Functional Test for Hard Disk	• Partition—0 - 7 [default] • Test Media—[Enable] [Disable] • Media Write Read Mode—[Readonly] [CompareRead] [WriteRead] • Media Test method—[SyncIO] [AsyncIO] • Media Coverage (% TB, GB, MB, KB, B) Raw Test Pattern (P0 to P15) • Media Transfer Size—[2KB] [16KB] [32KB] [64KB] [128KB] [256KB] [512KB] • Test File System—[Enable] [Disable] • File System File Size—[512KB] [2MB] [8MB] [20MB] [100MB] [200MB] • File System Transfer Size—[512B] [1024B] [10KB] [40KB] [80KB] • File System Test Pattern—[sequential] [0x00000000] [0xffffffff] [0x5aa55aa5] [0xdb6db6db] [random] Seek Pattern —[S~] (fixed to S) Seek Point (% TB GB MB KB B)—[I~] (fixed to I)
Functional Test for Floppy Disk	• (under Other-Devices group)—partition: 0 - 7 [default] • Test Media—[Enable] [Disable] • Media Write Read Mode—[Read-only] [BackupWriteRead] • Media Test Method—[SyncIO] [AsyncIO] • Media Coverage (% TB, GB, MB, KB, B) Raw Test Pattern (P0 to P15) • Media Transfer Size—[2KB] [10KB] [20KB] • Test File System—[Enable] [Disable] • Floppy File Size— [100KB] [200KB] • Floppy Transfer Size—[512B] [1024B] [10KB] • File System Test Pattern—[sequential] [0x00000000] [0xffffffff] [0x5aa55aa5] [0xdb6db6db] [random]

`disktest` Test Modes

TABLE 9-3 `disktest` Supported Test Modes

Test Mode	Description
Connection	Only one instance of `disktest` (which monitors UNIX error messages) is allowed for each disk device. `disktest` displays messages and reports errors. The test also opens the hard disk, checks the disk configuration, reads a few blocks, and then closes the hard disk. No File System subtest is run. No Write option is available in Connection test mode.
Functional	More than one instance of `disktest` is allowed for one disk device. The File System subtest, Media subtests, and floppy test can be run in Functional test mode. In Functional mode, disktest performs two additional subtests (Self subtest and Write/Read device buffer subtest) for enclosures. These two additional subtests help in isolating the errors and are completed before `disktest` continues with the Media subtest or File System subtest. In Functional test mode, `disktest` also monitors enclosures by checking for errors in the Read link status counters and issues a warning if any errors are detected.
Online	SunVTS `disktest` runs the Read Only `rawtest` with fixed transfer size and fixed `rawtest` pattern. Both SyncIO and AsyncIO test methods are available. The File system subtest is disabled in the Online test mode. Only one `disktest` instance could be run in the Online test mode.
Online	Supported

`disktest` Command-Line Syntax for SPARC Platforms

/opt/SUNWvts/bin/disktest *standard_arguments* **-o partition=***<0-7>* *[“<(mount_point)>”]***], rawsub=***E(nable)|D(isable)***, rawrw=** *Readonly|CompareRead|WriteRead***, rawiosize=***<number>{...|KB|kb...}|random***,** **rawcover=***<number>|<number>{TB|GB|MB|KB|B|tb|gb|mb|kb|b}* **rawpattern=***P(<0-15>)|0x<8 digit data pattern***>, seekpattern=** *{S|SR|LS|R|LB|LR|AB|AR}***, seekpoint=***{i|m|o|<number>}***, method=**

AsyncIO+SyncIO, **fssub=***E(nable)*|*D(isable)*, **fssize=** *<number>{K|KB|M|MB|k|kb|m|mb}*, **fsiosize=***<number>{K|KB|B|k|kb|b}*, **fspattern=***<data_pattern>*, **dev=***<device_name>*

TABLE 9-4 `disktest` Command-Line Syntax

<table>
<tr><th>Argument</th><th>Description</th></tr>
<tr><td>partition=<0-7>
[“<(mount_point)>”]</td><td>Specifies the partition number as follows:
• n—is the partition number (slice number), usually 0-7
• mount_point—is the mount point for the mounted partition that you plan to test
For example: partition=6”(/export)”</td></tr>
<tr><td>rawsub= E(nable)|D(isable)</td><td>Enables or disables the Media subtest.
For example: rawsub= Enable</td></tr>
<tr><td>rawrw=
Readonly|CompareRead|WriteRead</td><td>Specifies the Media subtest Read, Compare, and Write mode:
• Read only
• Read twice, Compare
(works only with SyncIO method)
• Write, Read, Compare, Restore
For example: rawrw=ReadOnly</td></tr>
<tr><td>rawiosize=
<number>{...|KB|kb...}|random</td><td>Specifies the media size to transfer. The block size can be specified in kilobytes. For example: 2K,...512K.
For example: rawiosize=9</td></tr>
<tr><td>rawcover=
<number>|<number>{TB|GB|MB|KB|B|tb|gb|mb|kb|b}</td><td>Specifies media coverage from 0-100 (percentage) of the partition. Media Coverage can also be specified in units: TB, GB, MB, KB and B.
For example: rawcover=40 OR rawcover=4GB</td></tr>
</table>

TABLE 9-4 `disktest` Command-Line Syntax *(Continued)*

Argument	Description
rawpattern=*P(<0-15>)|0x<8 digit data pattern>*	`rawpattern` could be specified as a pre-defined pattern set, *P(0-15)*, or an 8 digit pattern could be specified as: *0xaa55aa55+0xff00ff00+0x*. The following is a description of the supported pre-defined patterns: P0 – Low Frequency Pattern P1 – Low Transition Density Pattern P2 – High Transition Density Pattern P3 – Compliant Jitter Pattern P4 – Compliant Jitter: RPAT P5 – Compliant Jitter: CRPAT P6 – Compliant Jitter: JTPAT P7 – Compliant Jitter: CJTPAT P8 – Compliant Jitter: SPAT P9 – Compliant Jitter: CSPAT P10 – 8 Bit Cable Pattern P11 – 16 Bit Cable Pattern P12 – 8 Bit Xtalk Pattern P13 – 16 Bit Xtalk Pattern P14 – MFM Pattern P15 – Generic Test Patterns For example: **rawpattern=***P1*
seekpattern= *{S|SR|LS|R|LB|LR|AB|AR}*	`seekpattern` could be specified to select the type of seek test to run on the disk drive. `disktest` supports the following pattern types: S – Sequential SR – Sequential Reverse LS – Low Power Sequential R – Random LB – Low Power Butterfly LR – Low Power Reverse Butterfly AB – Actuator Butterfly AR – Actuator Reverse Butterfly For exmaple: `seekpattern=`*S*

TABLE 9-4 `disktest` Command-Line Syntax *(Continued)*

Argument	Description
seekpoint=*{i | m | o | <number>}*	Specify the seek-point for the I/O. This could be specified either in terms of the range - inner, middle and outer. Or in terms of absolute seek location. The absolute location is specied by a number followed by any of the following units {TB | GB | MB | KB | B | tb | gb | mb | kb | b}. For example: a) `seekpoint=`*I*, start the I/O from block 1. b) `seekpoint=`*M*, start the I/O from middle offset of the partition.
method=*AsyncIO+SyncIO*	Specifies the Media access method. You can choose to use either or both methods . If you use both access methods together, you must insert a '+' between the two: AsyncIO: Runs the asynchronous I/O test, using the async read/write feature of the Solaris disk driver SyncIO: Runs the synchronous I/O test. For example: **method=***AsyncIO*
fssub=*E(nable) | D(isable)*	Enables or disables the File System subtest. File system subtest runs on a mounted partition with a file system.
fspattern=*<data_pattern>*	Specifies the file system data pattern as sequential or random or one of the patterns selected from the list. *{seq(uential) | 0x0(0000000) | 0xf(fffffff) | 0xa (5a5a5a5) | 0x5(a5a5a5a) | ran(dom) | 0xd(b6db6db)}* For example: a) **fspattern=***0xa* a) **fspattern=***seq*
fssize= *<number>{K | KB | M | MB | k | kb | m | mb}*	Indicates the file system subtest size in Megabytes or Kilobytes: • `K|k|KB|kb` – kilobytes • `M|m|MB|mb` – megabytes `512KB| 2MB| 8MB| 20MB|100MB|200MB`
fsiosize= *<number>{K | KB | B | k | kb | b}*	Indicates the size of the file system subtest I/O transfer in bytes or Kilobytes: • B | b – bytes • `K|k|KB|kb` – Kilobytes `512B|1024B|10KB|40KB|80KB`
dev=*device_name*	Specifies the name of the disk to be tested. For example: c0t3d0.

The following example shows how to run `disktest` on a partition "0" (which is mounted under "/") for the disk device `c0t0d0`. The media subtest is enabled in ReadOnly mode using SyncIO method. The coverage specified is 30% with 512 KB transfer size. The File System subtest is disabled.

```
# /opt/SUNWvts/bin/disktest -f -o partition=0"(/)", rawsub=Enable,
rawrw=ReadOnly, method=SyncIO, rawcover=30, rawiosize=512KB,
fssub=Disable, dev=c0t0d0
```

`disktest` Command-Line Syntax for x86 Platforms

`/opt/SUNWvts/bin/disktest` *standard_arguments* **`-o`** `dev=`*device_name*, **`partition=`***<0-15> ["(mount_point)"***`]`**, **`rawsub=`***E(nable)|D(isable)*, **`rawrw=`***Readonly*, **`method=`***AsyncIO+SyncIO*, `rawcover=`*n*, `rawiosize=`*n*

TABLE 9-5 `disktest` Command-Line Syntax

Argument	Description
`dev=`*device_name*	Specifies the name of the disk to be tested. For example: c0t3d0.
`partition=`*<1-15> ["<(mount_point)>"***`]`**	Specifies the partition number as follows: • *n*—is the partition number (slice number), usually 1-15 • *mount_point*—is the mount point for the mounted partition that you plan to test For example: **`partition=6"(/export)"`**
`rawsub=` *E(nable)|D(isable)*	Enables or disables the Media subtest. For example: **`rawsub=`** *Enable*
`rawrw=`*Readonly*	Specifies the Media subtest Read, Compare, and Write mode: • Read only

TABLE 9-5 `disktest` Command-Line Syntax *(Continued)*

Argument	Description
`method=`*AsyncIO+SyncIO*	Specifies the Media access method. You can choose to use either or both methods . If you use both access methods together, you must insert a '+' between the two: AsyncIO: Runs the asynchronous I/O test, using the async read/write feature of the Solaris disk driver SyncIO: Runs the synchronous I/O test. For example: **`method=`***AsyncIO*
`rawcover=`*number*	Specifies media coverage from 0-100 (percentage) of the partition. Media Coverage can also be specified in units: TB, GB, MB, KB and B. For example: **`rawcover=`***40* OR **`rawcover=`***4GB*
`rawiosize=`*number*	Specifies the media size to transfer. The block size can be specified in kilobytes. For example: 2K,...512K. For example: **`rawiosize=`**9

Note – 64-bit tests are located in the `sparcv9` subdirectory: `/opt/SUNWvts/bin/sparcv9/`*testname*, or the relative path to which you installed SunVTS. If a test is not present in this directory, then it might be available as a 32-bit test only. For more information, see "32-Bit and 64-Bit Tests" on page 5.

CHAPTER **10**

Netra-CT 820 DMC Test (`dmctest`)

The `dmctest` tests major components in the drawer management controller (DMC) card. The components tested on the card include Flash memory, SDRAM, FPGA, RTC, I2C devices, UART chip, Fast Ethernet controller and PHY, Muxes, Alarm LEDs and so on. This test supports both the active (`dmcatest`) and standby (`dmcstest`) DMC card testing. The traces to be tested on the board include address bus, data bus, I2C bus, KCS, IPMI bus, Interrupt lines, and cPCI connector.

`dmctest` has the following subtests:

- Ethernet test

  The Ethernet test performs test on SCC Ethernet device. The test covers Phy, Internal, and External loopback. The Ethernet Ping test uses the FEC port. The Ethernet test is supported on both DMC Active and DMC Standby cards, and performs the following tests: External loopback test, Internal loopback test, Phy test, Ping test. The Ethernet test requires an external loopback connector plugged in to be able to perform the External loopback test.

- Flash test

  This test reads the entire 24 Mbyte flash area and performs a checksum test. The test is supported on both DMC Active and Standby cards.

- Alarm Port test

  This test toggles all four alarm ports: Critical, Major, Minor and Warning and reports Pass or Fail status. The test is supported on both DMC Active and Standby cards.

- Health test

This test checks systems health and reports the state of each slot. It reports the slot status; whether the slot is Healthy or Not-Healthy; whether the slot is Empty or Occupied; whether the slot is Powered-On or Powered-Off. It reports their status according to the following table:

Board Device	Health	Board Select	Status	Report
0	0	0	Slot occupied, but powered off	
0	0	1	Slot Empty	
0	1	0	Unpowered slot reporting healthy	Warning
0	1	1	Empty slot reporting healthy	Warning
1	0	0	Board select drive problem	Warning
1	0	1	Slot unhealthy	
1	1	0	Board select drive	Warning
1	1	1	Slot powered on	

- PMI test

  This test checks for the IPMI connectivity by sending IPMI commands to all slots that are occupied, then waits for their response. The IPMI command is sent to 18 node cards, both Switch cards and the DMC Standby card. This test performs up to four retries whenever it fails to receive a response. The retries are according to PICMG IPMI (Intelligent Platform Management Interface) Specification. The IPMI test that runs on the DMC Active card performs tests on all slots that are occupied. They are 18 node slots, two Switch cards, and the DMC Standby card. Whereas the IPMI test that runs on the DMC Standby card just tests the IPMI connectivity between the DMC Active and DMC Standby cards.

- RTC test

  This test runs on both DMC cards. It checks the Real Time Clock device and reports Pass or Fail status. It then displays the time of the day the status was obtained from RTC.

- Fan Status test

  This test checks the status for all three banks of three fans and reports their status as which fans are present and which fans are good. This test runs only on DMC Active cards.

- Fan Tachometer test

This test checks the Tachometer for all nine (three banks of three) fans. It reports their RPM value and their status as whether they are operating at normal speed or at warning or critical speed. This test runs only on DMC Active cards.

- FRU Presence test

  This test checks the status for all FRU devices available on Netra CT 820 systems. This test runs on DMC Active cards only.

FRU Device	Number of FRUs
Midplane	2
DMC Cards	2
Fan Trays	3
Switch Cards	2
Node CP2300 Cards	18

- FRUID Checksum test

  The FRUID Checksum test traverses through all available FRU devices on Netra CT 820 systems and checks for their FRU data. It reads FRU buffer, computes their Checksum, and compares with the checksum that is read from FRU devices. It then reports pass or failure status. This test loops for up to four reties whenever it fails to read requested FRU data, the retries loop is according to the IPMI specification.

- I2C Temperature test

  This I2C Temperature option performs tests on I2C devices. It obtains sensor temperature and reports their status such as: Pass, Warning, or Critical.

  There are eight Midplane Sensors and three Fan Sensors. It reports pass status when any of the Midplane or Fan senses temperatures are at about air temperature and rise from inlet to outlet at 55C ambient. Therefore a Midplane or Fan sensor warns the user if it reaches 75C (20C over 55C inlet), and it reports critical at 85C (30C over 55C max inlet air temperature). This test runs only on DMC Active cards.

- Power Supply Status test

  This test reports the status for all eight power supplies. The status contains whether the Power Supply is powered on or off, whether the power supply is Derating or not, or whether it is Healthy or Not-Healthy.

- Power Supply On/Off test

This test toggles all eight Power Supplies by turning them off and on. It toggles one Power Supply at a time starting from the first Power Supply and traversing through all eight Power Supplies.

Note – Enable the Power Supply On/Off test for only a limited number of runs; this test might degrade the life cycle of Power Supplies. This test runs on DMC Active cards only.

There is only one serial communication port available on DMC cards and this port is used for the Console. The serial port test is covered to enable entering commands in the console window and receiving responses from CLI commands—such as: `showhealth` or `showipmode`, and `ping`.

`dmcatest` Options

To reach the dialog box below, right-click on the test name in the System Map and select Test Parameter Options. If you do not see this test in the System Map, you might need to expand the collapsed groups, or your system may not include the device appropriate to this test. Refer to the *SunVTS User's Guide* for more details.

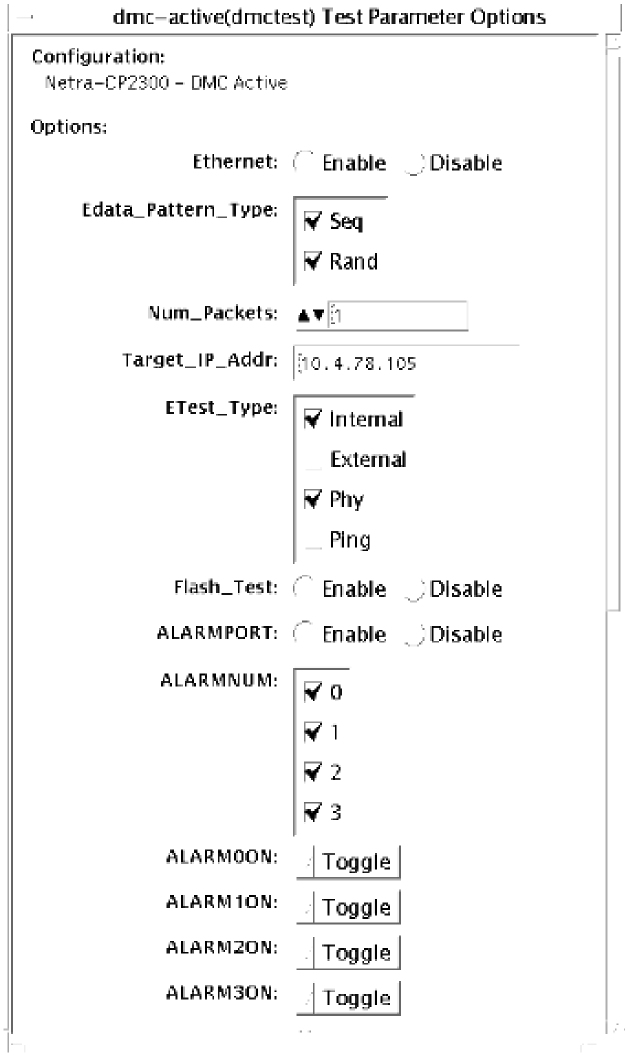


FIGURE 10-1 `dmcatest` (Active) Test Parameter Options Dialog Box (Top View)

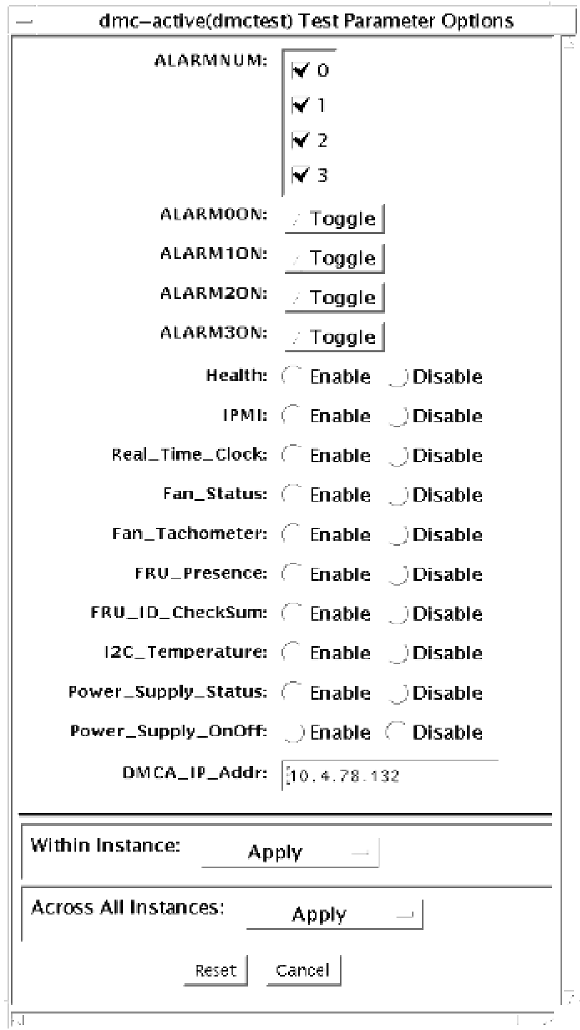


FIGURE 10-2 `dmcatest` (Active) Test Parameter Options Dialog Box (Bottom View)

TABLE 10-1 `dmcatest` Options

`dmctest` **Options**	**Description**
Ethernet	Enable or Disable the Ethernet test
Edata Pattern Type	Indicates pattern type; Seq = Sequence, Rand = Random
Num Packets	Indicates the number of packets to be tested
Target IP Address	Required IP address for Ethernet Ping test

TABLE 10-1 `dmcatest` Options *(Continued)*

`dmctest` **Options**	**Description**
Etest Type	Indicates the type of data to test
Flash Test	Enable or Disable the Flash test
ALARMPORT	Enable or Disable the ALARMPORT
ALARMNUM	Indicates the Alarm Number
ALARM00N	Toggles
ALARM10N	Toggles
ALARM20N	Toggles
ALARM30N	Toggles
Health	Enable or Disable the Health test
IPMI	Enable or Disable the IPMI test
Real Time Clock	Enable or Disable the Real Time Clock test
Fan Status	Enable or Disable the Fan Status test
Fan Tachometer	Enable or Disable the Fan Tachometer test
FRU Presence	Enable or Disable the FRU Presence test
FRU ID CheckSum	Enable or Disable the FRU ID Checksum test
I2CTemperature	Enable or Disable the I2C Tempature test
Power Supply Status	Enable or Disable the Power Supply Status test
Power Supply On/Off	Enable or Disable the Power Supply On/Off test; the default is Disable
DMCA IP Address	Required DMCA IP address

`dmcstest` Options

To reach the dialog box below, right-click on the test name in the System Map and select Test Parameter Options. If you do not see this test in the System Map, you might need to expand the collapsed groups, or your system may not include the device appropriate to this test. Refer to the *SunVTS User's Guide* for more details.

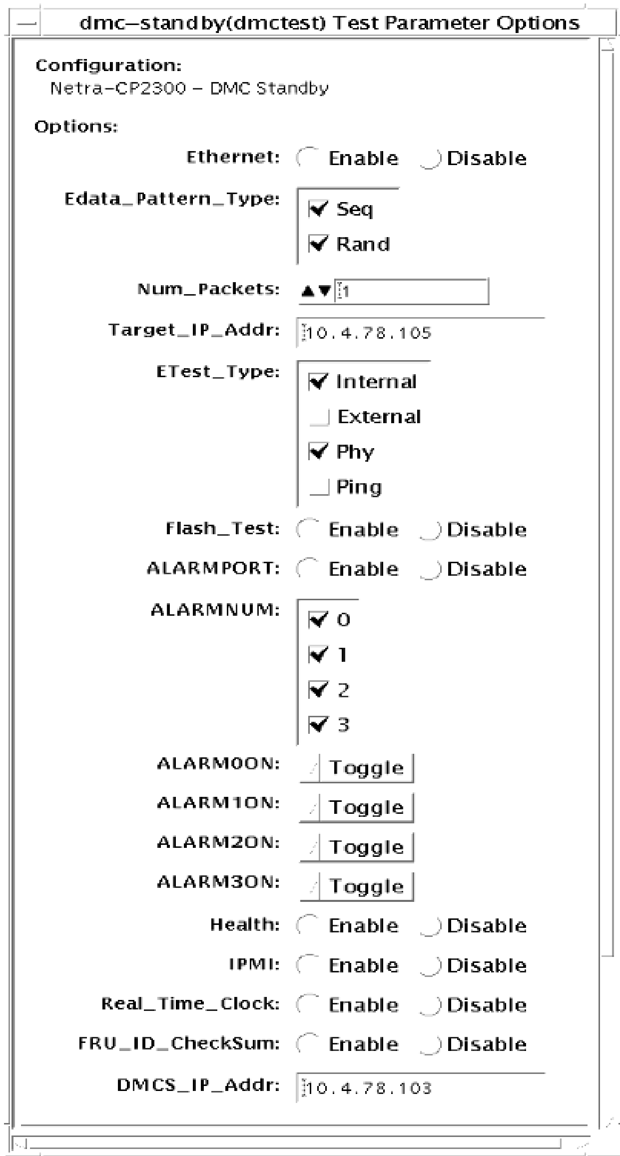

dmc–standby(dmctest) Test Parameter Options
Configuration:
Netra–CP2300 – DMC Standby
Options:
Ethernet: Enable Disable
Edata_Pattern_Type:
Seq
Rand
Num_Packets: 1
Target_IP_Addr: 10.4.78.105
ETest_Type:
Internal
External
Phy
Ping
Flash_Test: Enable Disable
ALARMPORT: Enable Disable
ALARMNUM:
0
1
2
3
ALARM0ON: Toggle
ALARM1ON: Toggle
ALARM2ON: Toggle
ALARM3ON: Toggle
Health: Enable Disable
IPMI: Enable Disable
Real_Time_Clock: Enable Disable
FRU_ID_CheckSum: Enable Disable
DMCS_IP_Addr: 10.4.78.103

FIGURE 10-3 `dmcstest` (Standby) Test Parameter Options Dialog Box

TABLE 10-2 `dmcstest` Options

`dmctest` **Options**	**Description**
Ethernet	Enable or Disable the Ethernet test
Edata Pattern Type	Indicates pattern type; Seq = Sequence, Rand = Random
Num Packets	Indicates the number of packets to be tested
Target IP Address	Required IP address for Ethernet Ping test
Etest Type	Indicates the type of data to test
Flash Test	Enable or Disable the Flash test
ALARMPORT	Enable or Disable the ALARMPORT
ALARMNUM	Indicates the Alarm Number
ALARM00N	Toggles
ALARM10N	Toggles
ALARM20N	Toggles
ALARM30N	Toggles
Health	Enable or Disable the Health test
IPMI	Enable or Disable the IPMI test
Real Time Clock	Enable or Disable the Real Time Clock test
FRU ID CheckSum	Enable or Disable the FRU ID Checksum test
DMCS IP Address	Required DMCS IP address

`dmctest` Supported Test Modes

TABLE 10-3 `dmctest` Supported Test Modes

Test Mode	Description
Function	Establishes communication with DMC Active Diag Daemon Actor, initiates all subtests that are enabled, and reports Pass or Fail status.
Connection	Attempts to establish communication with DMC Active Diag Daemon Actor and reports Pass or Fail status.

`dmcatest` Command-Line Syntax

`/opt/SUNWvtshm/bin/dmctest -o option=`*value*, **`enet=`**{*Enable*| *Disable*}, **`epattype=`**{*Seq+Rand*}, **`epkts=`**{*NUMERIC*|*1,5*}, **`target=`**{*IP_Address*}, **`etest=`**{*Internal+External+Ping+Phy*}, **`flash=`**{*Enable* | *Disable*}, **`aport=`**{*Enable* | *Disable*}, **`anum=`**{*0+1+2+3*}, **`a0on`**={*On*|*Off*|*Toggle*}, **`a1on`**={*On*|*Off*|*Toggle*}, **`a2on`**={*On*|*Off*|*Toggle*}, **`a3on`**={*On*|*Off*|*Toggle*}, **`health`**=*{Enable* | *Disable}*, **`ipmi`**={*Enable* | *Disable*}, **`rtc`**={*Enable* | *Disable*}, **`fanstatus`**={*Enable* | *Disable*}, **`fantac`**={*Enable* | *Disable*}, **`frupres`**={*Enable* | *Disable*}, **`fruidchksum`**={*Enable* | *Disable*}, **`i2ctemp`**={*Enable* | *Disable*}, **`psupplystatus`**={*Enable* | *Disable*}, **`powersupply`**={*Enable* | *Disable*}, **`dmca_ip`**=*IP_Address*, **`dmcs_ip`**=*IP_Address,* **`dev`**={*dmc-active* | *dmc-standby*}

TABLE 10-4 `dmcatest` Command-Line Syntax

Argument	Description
`enet=`{*Enable*| *Disable*}	Enable or Disable the Ethernet test
`epattype=`{*Seq+Rand*}	Indicates pattern type; Seq = Sequence, Rand = Random
`epkts=`{*NUMERIC*|*1,5*}	Indicates the number of packets to be tested
`target=`{*IP_Address*}	Required IP address for the Ethernet Ping test
`etest=`{*Internal+External+Ping+Phy*}	Indicates the type of data to test
`flash=`{*Enable* | *Disable*}	Enable or Disable the Flash test
`aport=`{*Enable* | *Disable*}	Enable or Disable the ALARMPORT
`anum=`{*0+1+2+3*}	Indicates the Alarm Number

TABLE 10-4 `dmcatest` Command-Line Syntax

Argument	Description
a0on={*On*|*Off*|*Toggle*}	Toggles ...
health=*{Enable | Disable}*	Enable or Disable the Health test
ipmi={*Enable* | *Disable*}	Enable or Disable the IPMI test
rtc={*Enable* | *Disable*}	Enable or Disable the Real Time Clock test
fanstatus={*Enable* | *Disable*}	Enable or Disable the Fan Status test
fantac={*Enable* | *Disable*}	Enable or Disable the Fan Tachometer test
frupres={*Enable* | *Disable*}	Enable or Disable the FRU Presence test
fruidchksum={*Enable* | *Disable*}	Enable or Disable the FRU ID Checksum test
i2ctemp={*Enable* | *Disable*}	Enable or Disable the I2C Tempature test
psupplystatus={*Enable* | *Disable*}	Enable or Disable the Power Supply Status test
powersupply={*Enable* | *Disable*}	Enable or Disable the Power Supply On/Off test; the default is Disable.
dmca_ip=*IP_Address*	Required DMCA IP address
dmcs_ip=*IP_Address*	Required DMCS IP address
dev={dmc-active | dmc-standby}	Specifies dmc-active or dmc-standby

`dmcstest` Command-Line Syntax

/opt/SUNWvtshm/bin/dmctest -o option=*value*, **enet=**{*Enable*\| *Disable*}, **epattype=**{*Seq+Rand*}, **epkts=**{*NUMERIC*\|*1,5*}, **target=**{*IP_Address*}, **etest=**{*Internal+External+Ping+Phy*}, **flash=**{*Enable* \| *Disable*}, **aport=**{*Enable* \| *Disable*}, **anum=**{*0+1+2+3*}, **a0on**={*On*\|*Off*\|*Toggle*}, **a1on**={*On*\|*Off*\|*Toggle*}, **a2on**={*On*\|*Off*\|*Toggle*}, **a3on**={*On*\|*Off*\|*Toggle*}, **health**=*{Enable* \| *Disable}*, **ipmi**={*Enable* \| *Disable*}, **rtc**={*Enable* \| *Disable*}, **fruidchksum**={*Enable* \| *Disable*}, **dmcs_ip**=*IP_Address,* **dev**={*dmc-active* \| *dmc-standby*}

TABLE 10-5 `dmcstest` Command-Line Syntax

Argument	Description
enet={*Enable*| *Disable*}	Enable or Disable the Ethernet test
epattype={*Seq+Rand*}	Indicates pattern type; Seq = Sequence, Rand = Random
epkts={*NUMERIC*|*1,5*}	Indicates the number of packets to be tested

TABLE 10-5 `dmcstest` Command-Line Syntax

Argument	Description
target={*IP_Address*}	Required IP address for the Ethernet Ping test
etest={*Internal+External+Ping+Phy*}	Indicates the type of data to test
flash={*Enable* | *Disable*}	Enable or Disable the Flash test
aport={*Enable* | *Disable*}	Enable or Disable the ALARMPORT
anum={*0+1+2+3*}	Indicates the Alarm Number
a0on={*On* | *Off* | *Toggle*}	Toggles ...
health=*{Enable* | *Disable}*	Enable or Disable the Health test
ipmi={*Enable* | *Disable*}	Enable or Disable the IPMI test
rtc={*Enable* | *Disable*}	Enable or Disable the Real Time Clock test
fruidchksum={*Enable* | *Disable*}	Enable or Disable the FRU ID Checksum test
dmcs_ip=*IP_Address*	Required DMCS IP address
dev={*dmc-active* | *dmc-standby*}	Specifies dmc-active or dmc-standby

CHAPTER 11

Sun Fire™ V880 FC-AL Disk Backplane Test (dpmtest)

dpmtest exercises and verifies the Fibre-Channel Mass Storage Subsystem in Sun Fire V880 product line platforms. dpmtest exercises various tests in the Fibre-Channel Backplane firmware for validating the mass storage system.

No special hardware is required to run the dpmtest test.

dpmtest Options

To reach the dialog box below, right-click on the test name in the System Map and select Test Parameter Options. If you do not see this test in the System Map, you might need to expand the collapsed groups, or your system may not include the device appropriate to this test. Refer to the *SunVTS User's Guide* for more details.

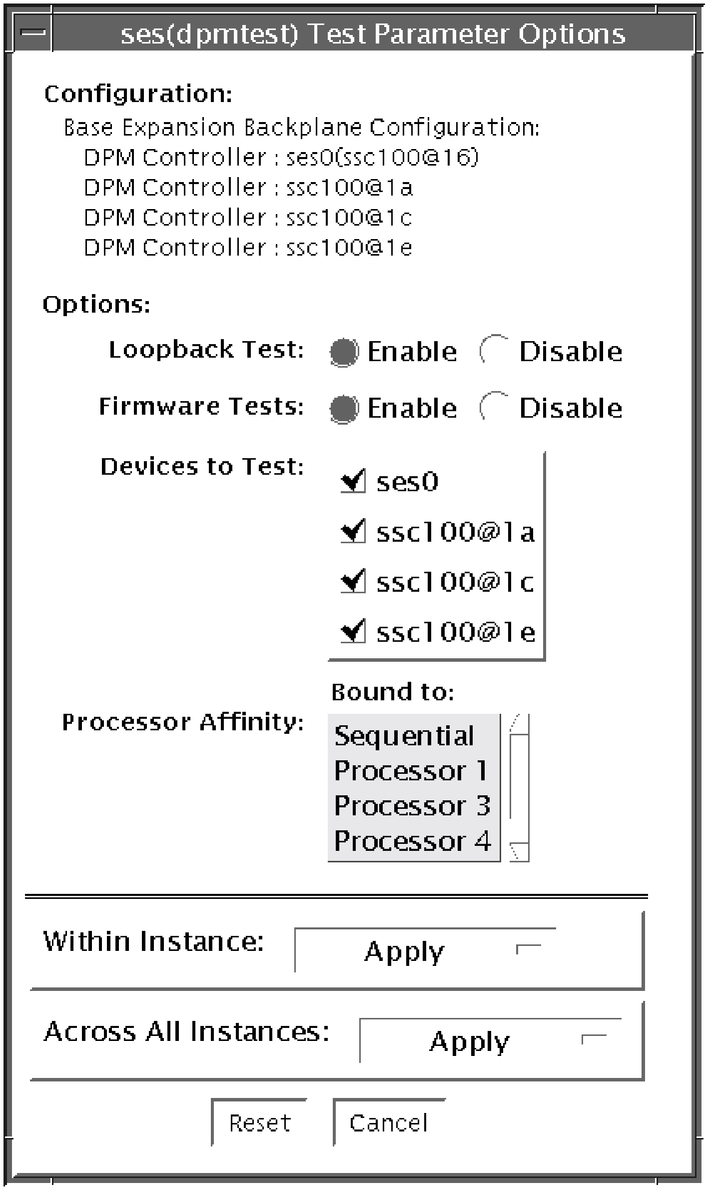


FIGURE 11-1 `dpmtest` Test Parameter Options Dialog Box

TABLE 11-1 `dpmtest` Test Options

Option	Description
Firmware Test	When enabled, the subtest runs the system friendly firmware tests on each of the selected SES/SSC100 devices. By default it is enabled.
Loopback Test	When enabled, the subtest will cause the SES device to loop packets around the fiber loop with varying data patterns. The device reads the packet after the packet is received, and verifies that the data payload is correct. By default it is enabled. Note: This test will run only on SES/SSC100 devices which are in the base backplane.
Devices to Test	The SES/SSC100 devices being tested. Users have an option to select or deselect each device for being tested. By default all the devices are selected for testing. Note: At least one device has to be selected for testing. If the user tries to deselect all of the devices, then an error message will be popped up. Note: If the device has both fibre and i2c paths, only the fibre path is listed under 'Devices to Test'. When you perform the tests on this device, the tests are run on both fibre and i2c paths.

`dpmtest` Test Modes

TABLE 11-2 `dpmtest` Supported Test Modes

Test Mode	Description
Connection	The test opens each selected device, extracts information about the device (wwn/wwpn, firmware revision, drives installed, temperatures, etc.) and displays the information for the user. If the device has both fibre and i2c paths, then information will be extracted from both the paths. After the test is performed on all the selected devices, the test closes the devices and exists.
Functional	The test opens each selected device and runs the selected subtests against the device. When fully run, the test closes the device and reports the results. Note: When no subtests are selected and you try to perform the functional testing, then just a configuration check will be performed.

`dpmtest` Command-Line Syntax

`/opt/SUNWvts/bin/dpmtest` *standard_arguments* **`-o dev=`***[device name]*, **`dpmdev=`***[device1+device2+...]*, **`fwtest=`***[Enable|Disable]*, **`lb=`***[Enable|Disable]*

TABLE 11-3 `dpmtest` Command-Line Syntax

Argument	Description
-o dev=*[device name]*	*[device name]* is the path name of the device being tested. The default value is ses. Since the current SunVTS infrastructure doesn't allow specifying multiple devices under the `dev` suboption, this suboption is not used in `dpmtest`. A new suboption dpmdev has been introduced to satisy this requirement.
dpmdev=*[device1+device2...]*	*device1*, *device2*,... represent the SES/SSC100 devices being tested. The default value is all the SSC100s present in the system. Note: The values for the `dpmdev` suboption can be device names such as `ses0`, `ses1`, `ssc100@16`, `ssc100@1a`, etc. Multiple values can be specified with a '+' (plus sign) seperator. An absolute path through fibre paths to devices are allowed (for expample, `/dev/es/ses0`) as `dpmdev` suboption values. However, absolute paths through a i2c path to devices are not allowed because commas are not allowed as part of a suboption value. Commas delimit suboptions in the options string (for example, `/devices/pci@9`, `700000/ebus@1/i2c@1`, `30/controller@0`, `16:ssc100`). Note: The following devices may be specified for the `dpmdev` suboption values in the Sun Fire V880 product line platforms: Fibre Path: • `ses0` - fibre path to base backplane's SSC100 (`/dev/es/ses0`) device on loopA. • `ses1` - fibre path to base backplane's SSC100 (`/dev/es/ses1`) device on loopB. This is valid only when a PCI FC Network Adapter is connected to loopB. I2C Path: • `ssc100@16` - base backplane's SSC100 device on loopA through a `i2c` path. • `ssc1001a` - base backplane's SSC100 device on loopB through a `i2c` path. • `ssc1001e` - expansion backplane's SSC100 device on loopB through a `i2c` path. Note: The exact fibre path device node names (`ses0`, `ses1`, etc..) may vary depending on device nodes created in the system. The valid fibre path device nodes, that `dpmtest` found during probing, can be found under 'Devices to Test' in the `dpmtest` Test Parameter Options dialog box.
lb=*[Enable|Disable]*	*Enable* or *Disable* loopback test. The default value is *Enable*. Note: The loopback test will run only on SES/SSC100 devices that are in the base backplane.
fwtest=*[Enable|Disable]*	*Enable* or *Disable* firmware tests. The default value is *Enable*.

CHAPTER **12**

Data Translation Look-aside Buffer (`dtlbtest`)

The `dtlbtest` verifies the proper functioning of DTLBs, but it does not measure performance of DTLBs.

Note – `dtlbtest` does support x86 platforms on Solaris.

This test verifies the following function of DTLBs:

1. Hit/miss tests: Stress DTLBs by generating large numbers of TLB hits and misses.
2. Address Pattern tests: Verify DTLBs correctly translate virtual addresses to physical addresses with stressful address patterns.

`dtlbtest` detects the installed CPU type and handles it's architectures in full extent.

`dtlbtest` is classified as an exclusive SunVTS test as its accuracy and coverage depends significantly on the system's background *quietness*. For the best result, avoid performing any other SunVTS tests in the background, and also disable all user processes and nonessential daemons.

`dtlbtest` Options

To reach the dialog box below, select the exclusive test mode and right-click on the test name in the System Map and select Test Parameter Options. If you do not see this test in the System Map, you might need to expand the collapsed groups, or your system may not include the device appropriate to this test. Refer to the *SunVTS User's Guide* for more details.

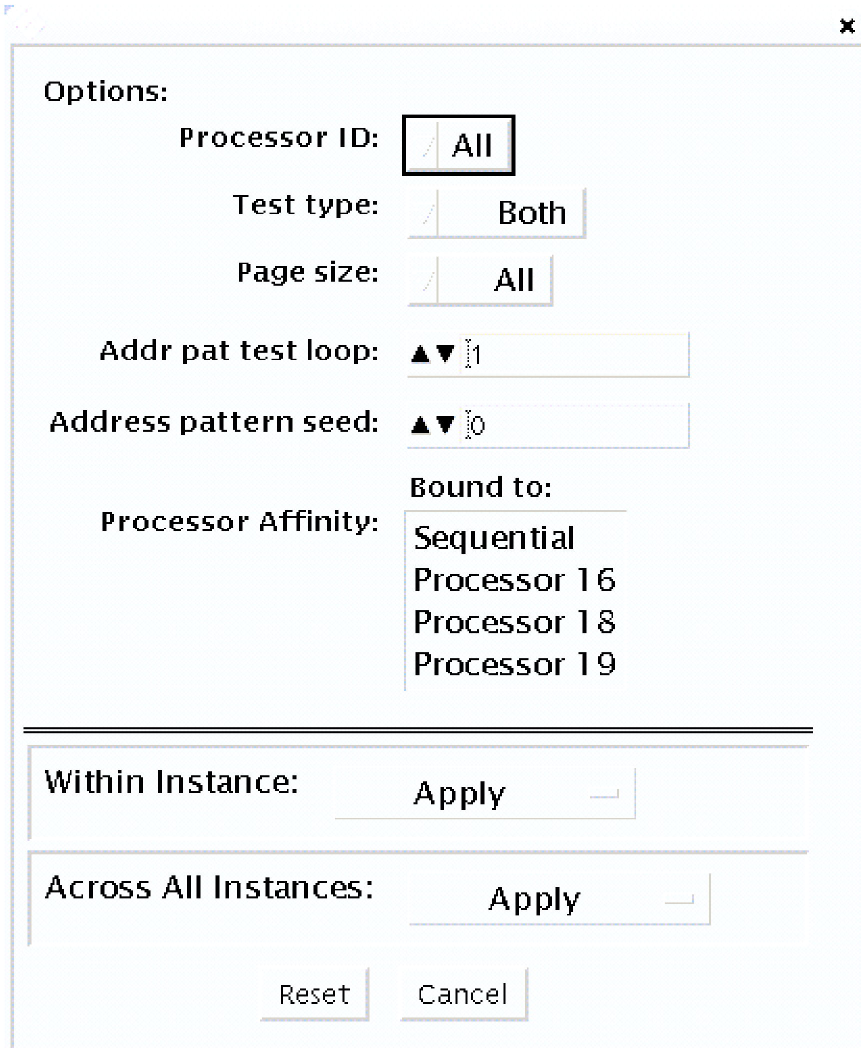


FIGURE 12-1 `dtlbtest` Test Parameter Options Dialog Box

TABLE 12-1 dtlbtest Options

Option	Description
Processor ID	Specifies the CPU Id for testing. The default value is all.
Test Type	Specifies the type of test need to be performed. Test type: Hit/miss and address pattern or both. The default value is both.
Page Size	Specifies the DTLB page size to test. The default value is all. Possible page size value: 8k, 64k, 512K, 4M.
Address Pattern loop count	Specifies the address pattern loop count. The default value is 1. loop count value ranges between 1 and 1000.
Address pattern seed value	Specifies the address pattern seed value. The default value is 0 i.e timestamp.

TABLE 12-2 `dtlbtest` Supported Test Modes

Test Mode	Description
Exclusive	Performs only the `dtlbtest` (full test).

`dtlbtest` Command-Line Syntax

`/opt/SUNWvts/bin/sparcv9/dtlbtest [-scruvdtlxnf] [-p n] [-i n] [-w n] [-o cpu=`*N*`, test=`*x*`, psize=`*x*`, aloop=`*n*`, aseed=`*n* `]`

TABLE 12-3 `dtlbtest` Command-Line Syntax

Argument	Description
`cpu=`*cpuid*	Specifies the cpuId. The default value is all. cpuid={0.....1023 | all}.
`test=`*testType*	Specifies the type of test. The default value is both. testType={h | a | both}.
`psize=`*pageSize*	Specifies the page size to be tested. The default value is all. pageSize={8K | 64K | 512K | 4M | all}.
`aloop=`*loopCount*	Specifies the address pattern loop count. The default value is 1. loopCount={1 .... 1000}.
`aseed=`*seedValue*	Specifies the address pattern seed value. The default value is 0.

CHAPTER 13

Environmental Test (envtest)

envtest exercises the I2C bus on the Sun Enterprise™ 450 product line. envtest contains five subtests to test and report on the power supply status, system temperature status, fan speed, disk LEDs, and front panel and keyswitch.

envtest is not scalable.

Note – Do not run envtest while the system is under a heavy load or false failures may be reported.

---

envtest Options

To reach the dialog box below, right-click on the test name in the System Map and select Test Parameter Options. If you do not see this test in the System Map, you might need to expand the collapsed groups, or your system may not include the device appropriate to this test. Refer to the *SunVTS User's Guide* for more details.

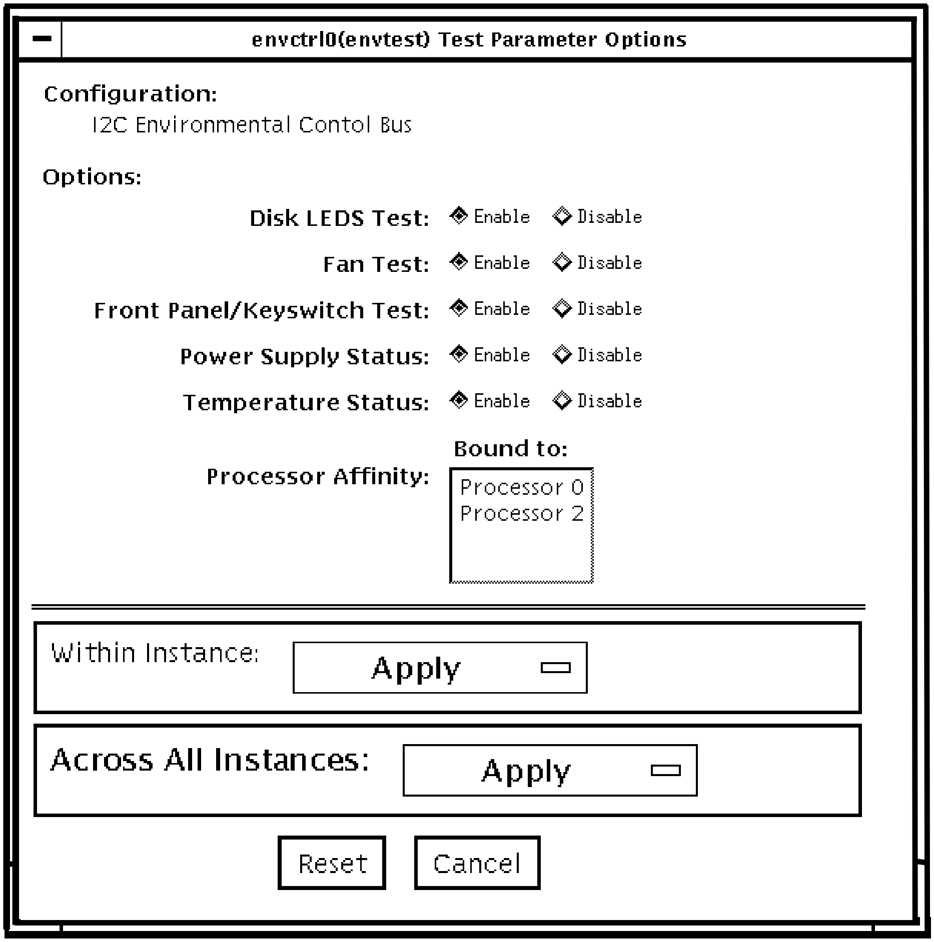


FIGURE 13-1 `envtest` Test Parameter Options Dialog Box

TABLE 13-1 `envtest` Options

`envtest` **Options**	**Description**
Disk LEDs test	Illuminates each LED on the disk backplane(s) to green, then amber, and then back to its original state. The test then illuminates all disk LEDs to green, then amber, and then back to their original state. This test is only enabled in Functional test mode.
Fan test	Cycles each fanbank speed to low, medium, and high, then verifies the correct speed. Next, each fanbank is stopped, one at a time. The test then verifies that a fan fault has occurred. Next, the watchdog timer is invoked to simulate a catastrophic failure. The test verifies that the system set all fanbanks to high and then resets the fan speed to normal. This test is only enabled in Functional test.
Front Panel and Keyswitch test	Flashes each individual LED on the front panel to ON (green or amber), then OFF, and then back to its original state. The test then illuminates all front panel LEDs then sets them back to their original state. The power on LED is Read Only and will not be cycled. The test then displays the current keyswitch position. This test is only enabled in Functional test mode.
Power Supply Status	Identifies the number of power supplies that are in the system, and the state of each power supply, and verifies that the power supply temperatures are within normal operating parameters. This test is enabled in all modes.
Temperature Status	Identifies the current temperature of each CPU in the system, and the ambient temperature of the system, and `envtest` verifies that all temperatures are within normal operating parameters. This test is enabled in all modes.

`envtest` Test Modes

`envtest` supports Connection and Functional tests.

TABLE 13-2 `envtest` Supported Test Modes

Test Mode	**Description**
Connection	Reports the status of the power supplies, the temperature sensors within the system, and verifies normal operating parameters.
Functional (Offline)	Tests the disk back panel, front panel LEDs, and fan control circuitry. Also uses the same functionality as online Functional mode and connection mode

`envtest` Command-Line Syntax

`/opt/SUNWvts/bin/envtest` [*standard arguments*]
`-o dev=`*raw_device_name***`,diskleds=`***E/D***`,fans`**=*E/D***`,fpanel`**=*E/D*,
`psupply`=*E/D***`,temp`**=*E/D*

TABLE 13-3 `envtest` Command-Line Syntax

Argument	Description
`dev=`*raw_device_name*	Specifies the name of the raw device to test.
`diskleds=`*enable|disable*	Enables or disables the Disk LEDS test.
`fans=`*enable|disable*	Enables or disables the Fans test.
`fpanel=`*enable|disable*	Enables or disables the Front Panel test.
`psupply=`*enable|disable*	Enables or disables the Power Supply test
`temp=`*enable|disable*	Enables or disables the Temperature test.

Note – 64-bit tests are located in the `sparcv9` subdirectory: `/opt/SUNWvts/bin/sparcv9/`*testname*, or the relative path to which you installed SunVTS. If a test is not present in this directory, then it might be available as a 32-bit test only. For more information, see "32-Bit and 64-Bit Tests" on page 5.

CHAPTER 14

Environmental Test (env2test)

env2test exercises and validates the I2C bus on the Sun Enterprise 250 systems.

Five subtests in env2test test and report the status of the power supply, system temperature, fan speed, disk LEDs, front panel, and keyswitch.

env2test is not scalable.

Note – Do not run env2test while the system is under a heavy load or false failures may be reported.

---

env2test Options

To reach the dialog box below, right-click on the test name in the System Map and select Test Parameter Options. If you do not see this test in the System Map, you might need to expand the collapsed groups, or your system may not include the device appropriate to this test. Refer to the *SunVTS User's Guide* for more details.

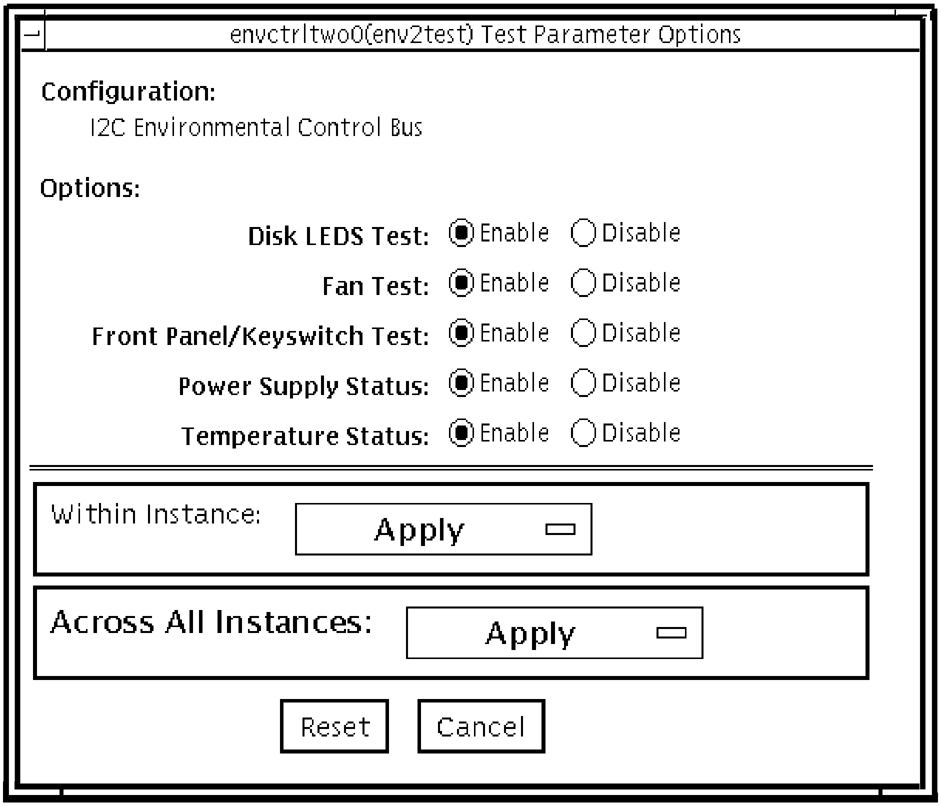


FIGURE 14-1 `env2test` Test Parameter Options Dialog Box

TABLE 14-1 `env2test` Options

`env2test` **Options**	**Description**
Disk LEDs test	Determines the number of disks that are present and the state of each disk. Illuminates each LED on the disk backplane to amber, and then back to its original state. The test then illuminates all disk LEDs to amber, and then back to their original state. This test is only enabled in Functional mode.
Fan test	Sets the fanbank speed to halfway between the current speed and max speed, then verifies the correct speed. Next, the fanbank speed is set to max speed, and the speed is verified. The fanbank speeds are then returned to normal, and then verified. This test is only enabled in Functional mode.
Front Panel and Keyswitch test	Flashes each individual LED on the front panel to On (green or amber), then Off, and then back to its original state. The test then illuminates all front panel LEDs then sets them back to their original state. The power on LED is read-only and will not be cycled. The test then displays the current keyswitch position. This test is only enabled in Functional mode.
Power Supply Status	Identifies the number of power supplies that are in the system and the state of each power supply. This test is enabled in all modes.
Temperature Status	Identifies the current temperature of each CPU in the system, the ambient temperatures of the system, the temperature on the SCSI and power distribution boards, and verifies that all temperatures are within normal operating parameters. This test is enabled in all modes.

`env2test` Test Modes

`env2test` supports Connection and Functional tests as described in the table below.

TABLE 14-2 `env2test` Supported Test Modes

Test Mode	**Description**
Connection	Reports the status of the power supplies and the temperature sensors within the system, and verifies normal operating parameters
Functional (Offline)	Tests the disk back panel, front panel LEDs, and fan control circuitry. Also uses the same functionality as online mode and connection test

`env2test` Command-Line Syntax

`/opt/SUNWvts/bin/env2test` [*standard arguments*]
`-o dev=`*device_name***`,diskleds=`***E/D***`,env_mon=`***poll_interval***`,fans=`***E/D,*
`fpanel=`*E/D***`,psupply=`***E/D***`,temp=`***E/D*

TABLE 14-3 `env2test` Command-Line Syntax

Argument	Description
`dev=`*raw_device_name*	Specifies the name of the raw device to test.
`diskleds=`*enable|disable*	Enables or disables diskleds test.
`env_mon=`*poll_interval*	Displays all system environmental statics every `poll_interval` seconds. (Display ONLY, does not test.)
`fans=`*enable|disable*	Enables or disables Fan test.
`fpanel=`*enable|disable*	Enables or disables Front Panel test.
`psupply=`*enable|disable*	Enables or disables Power Supply test.
`temp=`*enable|disable*	Enables or disables Temperature test.

Note – 64-bit tests are located in the `sparcv9` subdirectory: `/opt/SUNWvts/bin/sparcv9/`*testname*, or the relative path to which you installed SunVTS. If a test is not present in this directory, then it might be available as a 32-bit test only. For more information, see “32-Bit and 64-Bit Tests” on page 5.

CHAPTER **15**

Environmental Test (`env3test`)

`env3test` is an environmental control test for the Sun Blade 1000/2000, Sun Blade 100/150 and Sun Blade 1500/2500 workstation systems. Althought the central function of this test is regarding environmentals and hence common to all the platforms mentioned above, the exact behavior of the test is platform specific.

For Sun Blade 100/150 and 1000/2000, the test monitors the system by reading temperatures and fan speeds, as well as their limits. It reports whether the temperatures and fan speeds fall within system environmental condition limits. The MAX1617 temperature sensor keeps a set of hard limits for the maximum and minimum temperatures allowed within the system. If the temperature passes one of these limits, the system performs a hard shutdown to protect hardware components. env3test also checks against the environmental monitor daemon, which keeps its own limits. By reading these temperature values, the test reports the possibility of a failure of the system environmental feedback loop between the fans and the temperature sensors.

For Sun Blade 1500 and 2500, the test displays the temperature sensors and temperatures, and all the fans and their speeds in RPM. It has an option for logging this information. The test will fail if one or more fans are bad(don't spin), are disconnected or are weak. An appropriate error message will indicate a disconnected/bad case against a weak fan case.

For SunBlade 1500 and 2500, the env3test supports the exclusive mode and connectivity mode testing.

Note – (Sun Blade 100/150, 1000/2000) - If env3test fails to register temperature values, the system temperature indicators may be faulty.

Note – (Sun Blade 1500/2500) - env3test will fail if a fan is bad or is disconnected or if it is weak. Please check corresponding error message for the exact case. For SunBlade 1500, the outtake-fan rpm cannot be monitored due to hardware limitation.

Note – (Sun Blade 100/150, 1000/2000) - env3test will not run on operating environments earlier than the Solaris 8 10/00 operating environment.

`env3test` Options

To reach the dialog box below, right-click on the test name in the System Map and select Test Parameter Options. If you do not see this test in the System Map, you might need to expand the collapsed groups, or your system may not include the device appropriate to this test. Refer to the *SunVTS User's Guide* for more details.

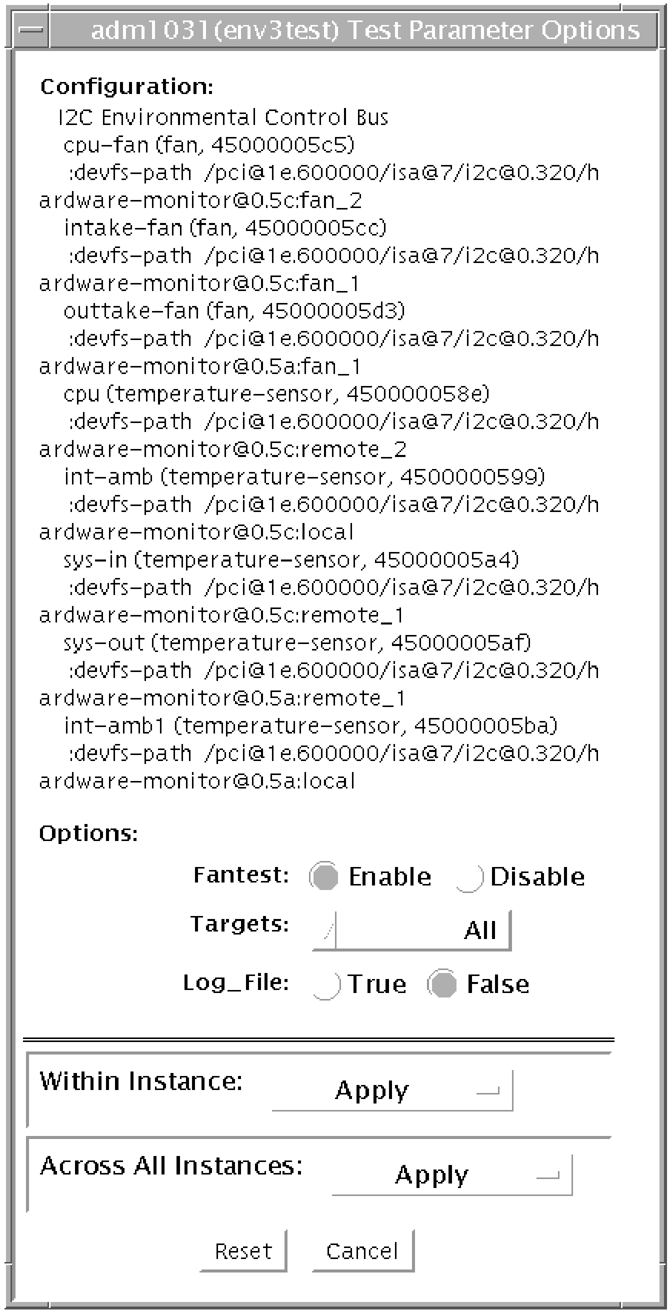


FIGURE 15-1 `env3test` Test Parameter Options Dialog Box (For Sun Blade 100/150, 1000/2000 and 1500/2500)

If the Log File option is set to True, the test logs two lines of information read from the system into the log file `/var/opt/SUNWvts/logs/env3test.log`. The first line is a time stamp. The second line is a list of names and the read values, as shown below:

```
Wed May 24 13:55:57 2000
system-fan , 19, cpu-fan , 49, power-supply-fan , 100, cpu , 81,
cpu-ambient ,24
```

The values for fan settings refer to the percentage of performance at which each fan is running. The system fan, for example, is running at 19% of its capacity. The temperature values are in degrees Celsius. The CPU in the above example is running at 81 degrees C.

`env3test` Test Modes

TABLE 15-1 `env3test` Supported Test Modes

Test Mode	Description
Connection	Attempts connection to the device. Supported on SB1500/SB2500 systems.
Functional	Reports the received information to the GUI logging window in verbose mode. Supported on SB150/SB1000 systems.
Exclusive	Reports the received information to the GUI logging window in verbose mode. Supported on SB1500/SB2500 systems.

`env3test` Command-Line Syntax

`/opt/SUNWvts/bin/env3test` [*standard arguments*] **`-o dev=`***driver_name***`,`** **`logging=`***true*|*false*, **`fantest`**=*enable*, **`fan`**=*All/intake-fan+outtake-fan*

TABLE 15-2 `env3test` Command-Line Syntax

Argument	Description
`dev=`*driver_name*	Specifies the driver name for this test. The driver for the Sun Blade 1000 is `max1617`.
`logging=`*true*|*false*	Enables or disables the logging feature.
`fantest`=*enable*	Enable fan test.
`fan`=*All/intake-fan+outtake-fan*	Specifies fan to be tested (i.e. cpu-fan, intake-fan, outtake-fan). The keyword "All" specifies all the fan env3test probe found.

Note – 64-bit tests are located in the `sparcv9` subdirectory: `/opt/SUNWvts/bin/sparcv9/`*testname*, or the relative path to which you installed SunVTS. If a test is not present in this directory, then it might be available as a 32-bit test only. For more information, see “32-Bit and 64-Bit Tests” on page 5.

CHAPTER 16

Environmental Test (env5test)

env5test exercises and validates the environmental subsytems of the Sunfire 280R product line. This test contains subtests to exercise a system's fans, keyswitch, LEDs, power supplies and temperature sensors.

This test is not scalable.

Note – Only the 64-bit version of this test is supported.

---

env5test Test Requirements

- You must install the SUNWpiclh, SUNWpiclr, SUNWpiclu, and SUNWpiclx picl packages correctly before running env5test.
- Verify that the picld daemon is running by typing the following:

```
# ps -ef |grep picld
root 100077      1  0   Sep 11 ?       23:40 /usr/lib/picl/picld
```

If the daemon is not running, run the script to restart it by typing the following:

```
# /etc/init.d/picld start
```

env5test Options

To reach the dialog box below, right-click on the test name in the System Map and select Test Parameter Options. If you do not see this test in the System Map, you might need to expand the collapsed groups, or your system may not include the device appropriate to this test. Refer to the *SunVTS User's Guide* for more details.

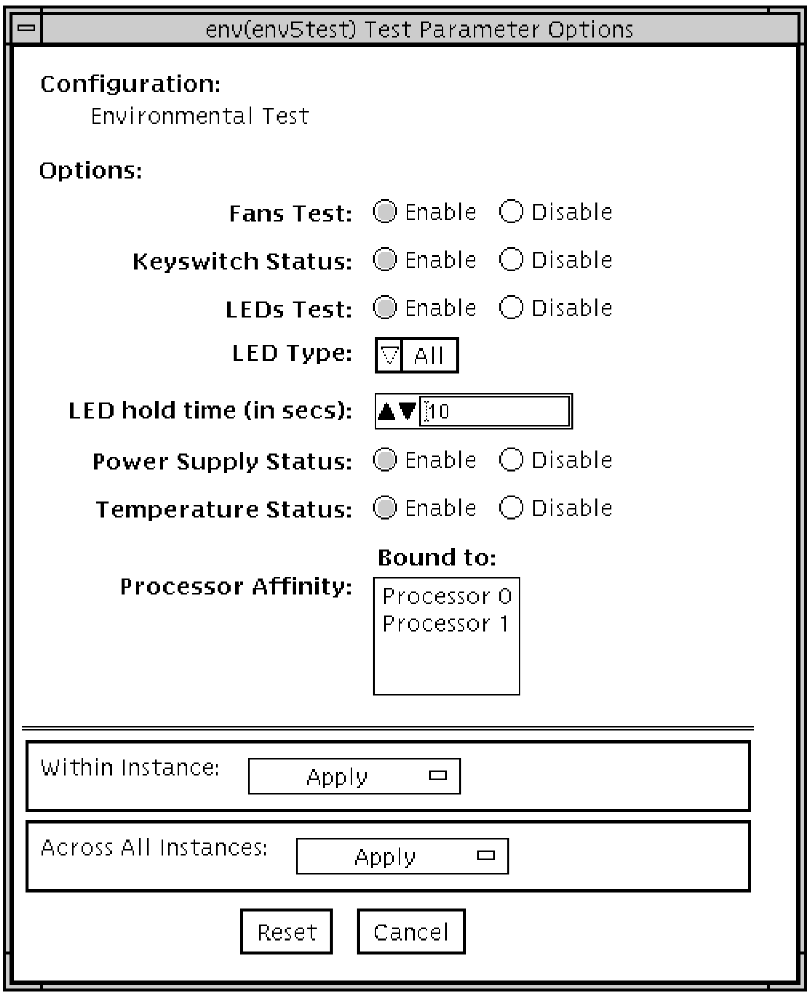


FIGURE 16-1 `env5test` Test Parameter Options Dialog Box

TABLE 16-1 `env5test` Options

Options	Description
Fan test	Cycles each fan bank in the system and identifies its current speed and state. Displays fault information if the state is not correct. Provides different test coverage for various types of fans based on their properties. Only enabled in Functional test mode.
Keyswitch status	Displays the current keyswitch position. Enabled in all modes.
LEDs test	Enables or disables the LEDS subtest. Default is Disable. Flashes each individual green or amber LED in the system on, then off, then back to its original state. You can select to test all LEDs (by default) or test by categories. Also specifies how long the LEDs stay on during the exercise. Only enabled in Functional test mode.
LED Type	Sets the type of LED category to be tested. Default is All.
LED hold time	Sets the number of seconds that LEDs are turned on during the LED subtest. Values are 0 to 10. Default is 0.
Power supply status	Identifies the number of power supplies in the system, the state of each one, and current (I) draw information if applicable. Displays fault information if the state of the power supply is incorrect. Enabled in all modes.
Temperature status	Identifies the current temperature of temperature sensors in the system and verifies that all temperatures are within normal operating parameters. Enabled in all modes.

`env5test` Test Modes

TABLE 16-2 `env5test` Supported Test Modes

Test Mode	Description
Connection	Runs the Keyswitch, Power Supply, and Temperature subtests. Reports on the status only of system fans. Verifies normal operating parameters.
Functional (Offline)	Runs the full set of subtests.

`env5test` Command-Line Syntax

/opt/SUNWvts/bin/sparcv9/env5test *standard_arguments*
-o dev=*raw_device_name***,leds=***E*|*D***,ledtype=***category***,ledtime=***num_seconds***,**
keys=*E*|*D***,fans=***E*|*D***,psupply=***E*|*D***,temp=***E*|*D*

TABLE 16-3 `env5test` Command-Line Syntax

Argument	Description
dev=*raw_device_name*	Specifies the name of the raw device to test. Default is `/dev/env`
leds=*E*|*D*	Enables or disables the LEDS subtest. Default is Disable.
ledtype=*category*	Sets the type of LED category to be tested. Default is All.
ledtime=*num_seconds*	Sets the number of seconds that LEDs are turned on during the LED subtest. Values are 0 to 10. Default is 0.
keys=*E*|*D*	Enables or disables the Keyswitch subtest. Default is Enable.
fans=*E*|*D*	Enables or disables the Fans subtest. Default is Disable.
psupply=*E*|*D*	Enables or disables the Power supply subtest. Default is Enable.
temp=*E*|*D*	Enables or disables the Temperature subtest. Default is Enable.

CHAPTER 17

Environmental Test (env6test)

env6test exercises and validates environmental subsytems. This test contains subtests to exercise a system's fans, keyswitch, LEDs, power supplies, and temperature sensors.

This test is not scalable.

env6test Options

To reach the dialog box below, right-click on the test name in the System Map and select Test Parameter Options. If you do not see this test in the System Map, you might need to expand the collapsed groups, or your system may not include the device appropriate to this test. Refer to the *SunVTS User's Guide* for more details.

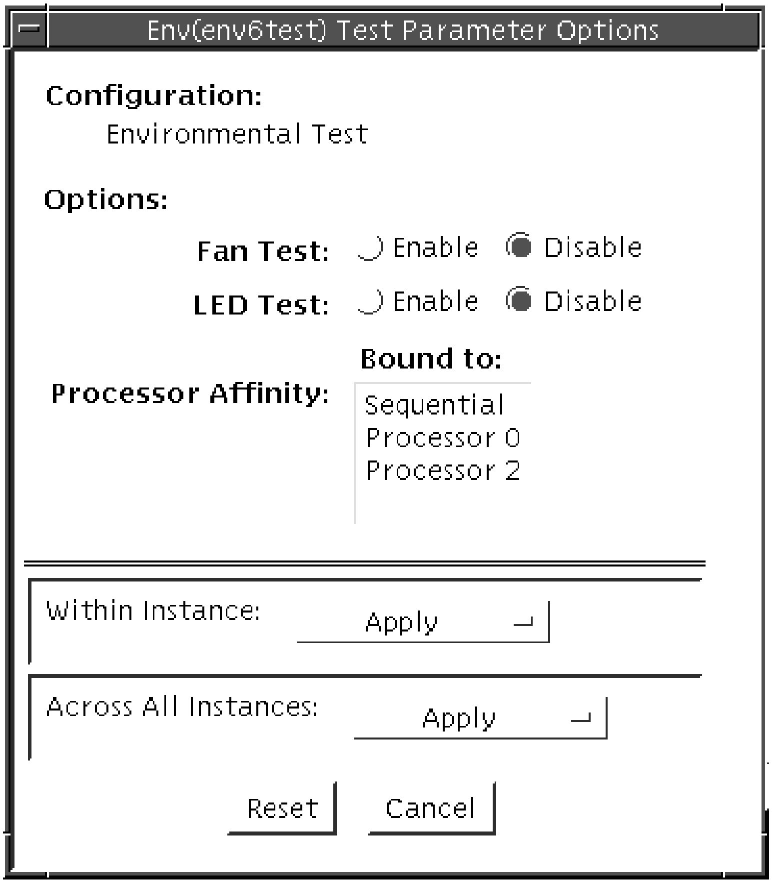


FIGURE 17-1 `env6test` Test Parameter Options Dialog Box

TABLE 17-1 `env6test` Options

`env6test` **Options**	**Description**
Fan Test	Checks the status, tolerance, and speed of the system's fans. Default is Disable.
LED Test	Checks overall status of system's LEDs by switching them ON and OFF. Default is Disable.

`env6test` Test Modes

TABLE 17-2 `env6test` Supported Test Modes

Test Mode	Description
Connection	Reports current state of devices.
Exclusive	Performs all tests including the Fan and LED subtests if they are enabled.

`env6test` Command-Line Syntax

`/opt/SUNWvts/bin/env6test` *standard_arguments*
`-o dev=`*raw_device_name***`,led=`***Enable* | *Disable***`,fan=`***Enable* | *Disable*

TABLE 17-3 `env6test` Command-Line Syntax

Argument	Description
`dev=`*raw_device_name*	Specifies the name of the raw device to test. Default is `/dev/env`
`led=`*Enable* | *Disable*	Enables or disables the LEDS subtest. Default is Disable.
`fan=`*Enable* | *Disable*	Enables or disables the Fans subtest. Default is Disable.

Note – 64-bit tests are located in the `sparcv9` subdirectory: `/opt/SUNWvts/bin/sparcv9/`*testname*, or the relative path to which you installed SunVTS. If a test is not present in this directory, then it might be available as a 32-bit test only. For more information, see “32-Bit and 64-Bit Tests” on page 5.

CHAPTER 18

Floating Point Unit Test (fputest)

The fputest checks the functionality of the floating point unit in a Sun SPARC based CPU. The test verifies the functionality by various arithmetic operations. In addition, the fputest stresses the CPU with the use of benchmarks. Both single and double precision numbers are used for the operations.

Note – fputest does support x86 platforms on Solaris.

Note – Three benchmarks of fputest—cparanoia, kcdiv, and kcsqrt—have been ported over for x86 systems. The x86 version of fputest only uses the Double Precision operations for rounding, chopping, sticky bit, and so on.

When fputest is chosen in Exclusive test mode from the SunVTS graphical user interface, it may run multiple instances in parallel on different CPUs. The number of such instances that may be running in parallel at the same time is dynamically determined depending on system resources.

fputest Subtests

Instruction tests:

- FSR Register test
- Registers test
- NACK test
- Move Registers test
- Positive to Negative test
- Negative to Positive test
- Absolute test
- Single-Precision Integer to Floating Point test

- Double-Precision Integer to Floating Point test
- Single-Precision Floating Point to Integer test
- Double-Precision Floating Point to Integer test
- Single-Precision Round Toward Zero test
- Double-Precision Round Toward Zero test
- Single to Double-Precision Format Conversion test
- Double to Single-Precision Format Conversion test
- Single and Double-Precision Addition, Subtraction, Multiplication, Square-root, Division, and Compare tests
- Single and Double-Precision Compare and Exception if Unordered tests
- Branching and No Branching on Condition Instructions tests
- Single and Double-Precision Chaining tests
- Weitek Status tests
- Lock test
- Single and Double-Precision Datapath tests
- Timing (load) test

Benchmark tests:

- Linpack test
- Cparanoia test
- Kcsqrt test
- Kcdiv test
- Clorenz test
- Cvector test

`fputest` Options

To reach the dialog box below, right-click on the test name in the System Map and select Test Parameter Options. If you do not see this test in the System Map, you might need to expand the collapsed groups, or your system may not include the device appropriate to this test. Refer to the *SunVTS User's Guide* for more details.

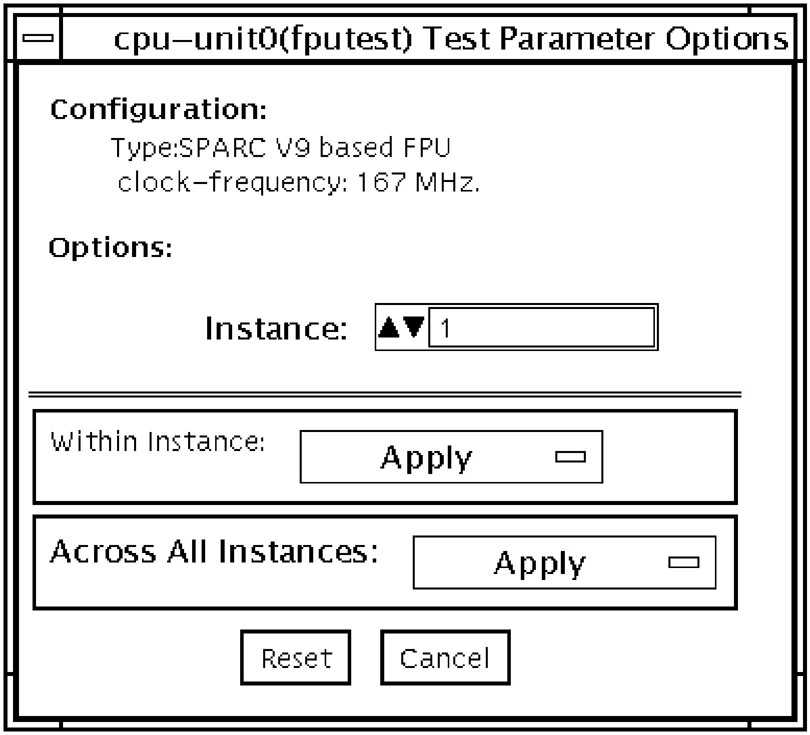


FIGURE 18-1 `fputest` Test Parameter Options Dialog Box

Note – It is not advisable to use the Processor Affinity option for this test. Doing so reduces the effectiveness of the test.

`fputest` Test Modes

TABLE 18-1 `fputest` Supported Test Modes

Test Mode	Description
Connection	Includes all the instruction tests.
Functional (Offline)	Performs all the instruction tests and all the benchmark tests.
Stress mode	Performs several `fpu` benchmark tests.
Online	Supported
Exclusive	Supported

`fputest` Command-Line Syntax

`/opt/SUNWvts/bin/fputest` [**`-scruvdtlxnf`**] [**`-p n`**] [**`-i n`**] [**`-w n`**] [**`-o dev=cpu-unit`***N*]

Note – Options `-s`, `-p`, `-i`, and `-w` are not applicable when tests are invoked from the command line.

TABLE 18-2 `fputest` Command-Line Syntax

Argument	Description
`-s`	Enables SunVTS mode
`-c`	Enables core file
`-r`	Enables run on error
`-u`	Enables list usage
`-v`	Enables verbose mode
`-d`	Enables debug mode
`-t`	Enables test function trace mode
`-l`	Enables online mode
`-x`	Enables exlusive mode

TABLE 18-2 `fputest` Command-Line Syntax

Argument	Description
`-n`	Enables connectivity mode
`-f`	Enables offline mode
-p n	*n* specifies the number of passes. The default is 1.
`-i` *n*	*n* specifies the number of total instances for the test. The default is 1.
`-w` *n*	*n* specifies which instance this test is assignes. The default is 0.
`-o`	Enables test specific command arguments
`dev=cpu-unit`*N*	Specifies the CPU unit to be tested. *N* specifies the numeric ID of online CPU.

Usage Examples:

Note – When using `fputest` specific arguments the `-o` AND `dev` options are required.

To execute exclusive `fputest` with verbose messages against CPU 72, use the following syntax:

```
# /opt/SUNWvts/bin/fputest -xvo dev=cpu-unit72
```

To execute functional `fputest` with verbose messages against CPU 3, use the following syntax:

```
# /opt/SUNWvts/bin/fputest -fvo dev=cpu-unit3
```

Note – 64-bit tests are located in the `sparcv9` subdirectory: `/opt/SUNWvts/bin/sparcv9/`*testname*, or the relative path to which you installed SunVTS. If a test is not present in this directory, then it might be available as a 32-bit test only. For more information, see “32-Bit and 64-Bit Tests” on page 5.

CHAPTER 19

IEEE 1394 Camera Test (fwcamtest)

fwcamtest tests the parameters and display functions of an IEEE 1394 digital camera, such as vid mode, frame rate, and frames received. This test currently supports the LG PC-10 camera.

Note – Do not run the fwcamtest and vmemtest at the same time on any Sun Blade™ system. This may cause the tests to fail.

Note – Do not start Sunforum™ (or any application that uses the dcam0 device) while fwcamtest is running. This causes the test to fail.

---

fwcamtest Test Requirements

Start a Window Environment

The system that runs fwcamtest must already be running a window environment, such as CDE. If the system has no window environment, or is only displaying the login window, fwcamtest will neither pass nor fail.

Note – Your window system must be operating in 24-bit depth to run the display test. Instructions for changing this setting are below.

If you are working in CDE, you can change your system to 24-bit depth by editing the file `/usr/dt/config/Xservers` or `/etc/dt/config/Xservers`. The file `/etc/dt/config/Xservers` overrides the file `/usr/dt/config/Xservers`. Edit the appropriate file to include the following line:

```
:0   Local local_uid@console root /usr/openwin/bin/Xsun :0
-nobanner -dev /dev/fbs/ffb0 defdepth 24 defclass TrueColor
```

Testing Through a Remote Connection

While running `fwcamtest` through a remote connection (such as a telnet session), if the `DISPLAY` variable is not set properly, it will cause numerous warning messages to display. These messages are logged and can fill up the log files. To avoid this, set your `DISPLAY` variable for the local host, and perform `xhost` *remote_host* on the local host before you start SunVTS and run `fwcamtest`.

`fwcamtest` Subtests

`fwcamtest` has three subtests:

- Parameter Test—Tests the digital camera parameters such as vid mode and brightness.
- Framereceive Test—Initializes the vid mode, framerate and ring buffer capacity parameters, then checks for the frame received.
- Display Test—Displays the captured frames. This display test sets up the 1394 bus for asynchronous transfer mode. The display test will only display the frames on the host running the test; it cannot display on a remote host.

`fwcamtest` Options

To reach the dialog box below, right-click on the test name in the System Map and select Test Parameter Options. If you do not see this test in the System Map, you might need to expand the collapsed groups, or your system may not include the device appropriate to this test. Refer to the *SunVTS User's Guide* for more details.

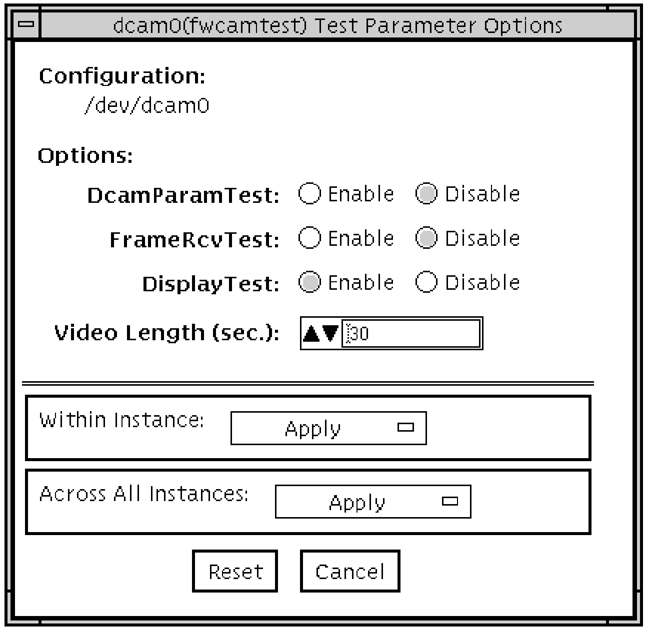


FIGURE 19-1 `fwcamtest` Test Parameter Options Dialog Box

TABLE 19-1 `fwcamtest` Options

`fwcamtest` **Options**	**Description**
DcamParamTest	Enables or disables the Parameter subtest.
FrameRevTest	Enables or disables the Frame Receive subtest.
DisplayTest	Enables or disables the Display subtest.
Video Length	Determines, in seconds, how long the screen display lasts.

`fwcamtest` Test Modes

TABLE 19-2 `fwcamtest` Supported Test Modes

Test Mode	Description
Functional (Offline)	Runs the full set of tests.

`fwcamtest` Command-Line Syntax

`/opt/SUNWvts/bin/fwcamtest` *standard_arguments*
`-o dev=`*dcam0***`,dcamparam=`***E(nable)*|*D(isable)***`,framercv=`***E*|*D***`,display=`***E*|*D***`,`**
`T=`*seconds*

TABLE 19-3 `fwcamtest` Command-Line Syntax

Argument	Description
`dev=`*dcam0*	Specifies the device name for this test.
`dcamparam=`*E(nable)*|*D(isable)*	Enables or disables the Parameter subtest.
`framercv=`*E*|*D*	Enables or disables the Frame Receive subtest.
`display=`*E*|*D*	Enables or disables the Display subtest.
`T=`*seconds*	Specifies the time period of the display test in seconds.

Note – 64-bit tests are located in the `sparcv9` subdirectory: `/opt/SUNWvts/bin/sparcv9/`*testname*, or the relative path to which you installed SunVTS. If a test is not present in this directory, then it might be available as a 32-bit test only. For more information, see “32-Bit and 64-Bit Tests” on page 5.

CHAPTER 20

I2C Bus Test (i2ctest)

i2ctest checks each I2C bus for the status of its devices. i2ctest then determines any device faults based on the information it collects, and displays a report. i2ctest also detects and reports hung I2C bus segments.

This test is scalable.

Note – Only the 64-bit version of this test is supported.

i2ctest Test Requirements

- You must have the SUNWpiclh, SUNWpiclr, SUNWpiclu, and SUNWpiclx picl packages installed correctly before running the test.
- Verify that the picld daemon is running by typing the following:

```
# ps -ef |grep picld
root 100077      1  0   Sep 11 ?       23:40 /usr/lib/picl/picld
```

If the daemon is not running, run the script to restart it by typing the following:

```
# /etc/init.d/picld start
```

`i2ctest` Options

To reach the dialog box below, right-click on the test name in the System Map and select Test Parameter Options. If you do not see this test in the System Map, you might need to expand the collapsed groups, or your system may not include the device appropriate to this test. Refer to the *SunVTS User's Guide* for more details.

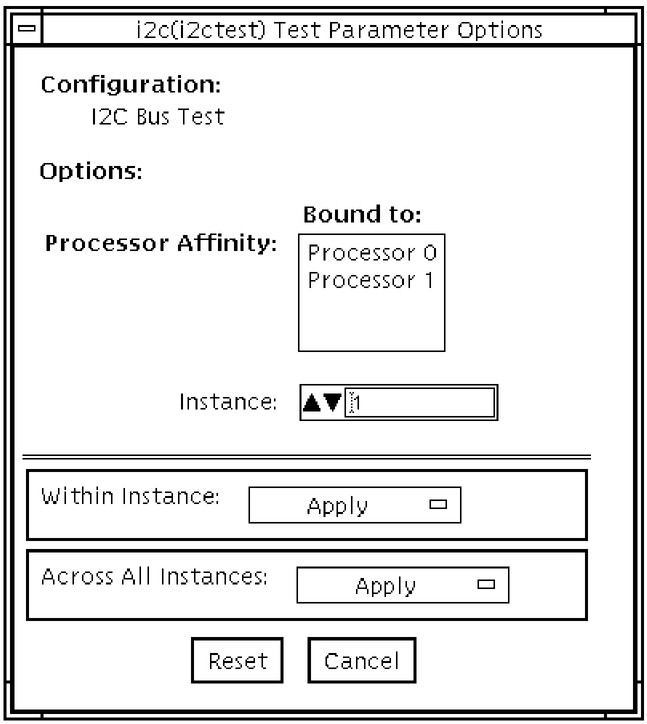


FIGURE 20-1 `i2ctest` Test Parameter Options Dialog Box

`i2ctest` Test Modes

TABLE 20-1 `i2ctest` Supported Test Modes

Test Mode	Description
Connection	Runs the full test.
Functional (Offline)	Runs the full test.

`i2ctest` Command-Line Syntax

`/opt/SUNWvts/bin/sparcv9/i2ctest` *standard_arguments*
`-o dev=`*raw_device_name*

TABLE 20-2 `i2ctest` Command-Line Syntax

Argument	Description
`dev=`*raw_device_name*	Specifies the name of the raw device to test.

CHAPTER **21**

I2C Inter-Integrated Circuit Test (`i2c2test`)

The `i2c2test` is designed to verify the proper placement, operation, and data integrity on the various I2C devices.

This test is not scalable.

`i2c2test` Options

To reach the dialog box below, right-click on the test name in the System Map and select Test Parameter Options. If you do not see this test in the System Map, you might need to expand the collapsed groups, or your system may not include the device appropriate to this test. Refer to the *SunVTS User's Guide* for more details.

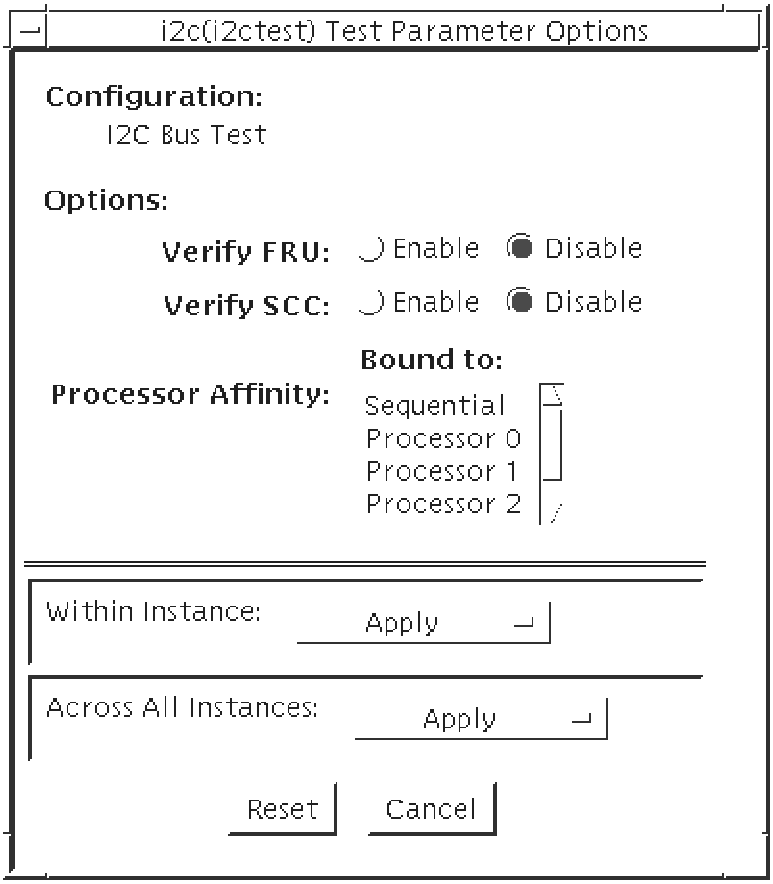


FIGURE 21-1 `i2c2test` Test Parameter Options Dialog Box

TABLE 21-1 `i2c2test` Options

`i2c2test` **Options**	**Description**
Verify FRU	Verifies the status of the FRU. Default is Disable.
Verify SCC	Verifies the status of the SCC. Default is Disable.
Processor Affinity	Specifies the processors to be tested in sequential order.

`i2c2test` Test Modes

TABLE 21-2 `i2c2test` Supported Test Modes

Test Mode	Description
Connection	Performs a test to verify connection to all I2C devices.
Exclusive	Performs a test to verify connection to all I2C devices, and also performs a test to verify that the `fru` and `scc` content is consistent with the user's selection.

`i2c2test` Command-Line Syntax

`/opt/SUNWvts/bin/i2c2test` *standard_arguments*
`-o dev=`*raw_device_name*,**`chkfru`**=*Enable*|*Disable*,**`chkscc`**=*Enable*|*Disable*

TABLE 21-3 `i2c2test` Command-Line Syntax

Argument	Description
`dev=`*raw_device_name*	Specifies the name of the raw device to test.
`chkfru`=*Enable*|*Disable*	Verifies the status of the FRU. Default is Disable.
`chkscc`=*Enable*|*Disable*	Verifies the status of the SCC. Default is Disable.

Note – 64-bit tests are located in the `sparcv9` subdirectory: `/opt/SUNWvts/bin/sparcv9/`*testname*, or the relative path to which you installed SunVTS. If a test is not present in this directory, then it might be available as a 32-bit test only. For more information, see "32-Bit and 64-Bit Tests" on page 5.

CHAPTER 22

Expert3D Frame Buffer Test (ifbtest)

ifbtest verifies the functionality of the Expert3D frame buffer.

ifbtest can detect and adapt to many video modes of the Expert3D frame buffer. All tests can run at a resolution of 1024x768 or higher.

You can interrupt ifbtest using Control-C.

Test accuracy is checked using direct image comparison against compressed images. Failed pixel locations are printed as error messages.

Caution – Do not run any other application or screen saver program that uses the Expert3D accelerator port while running ifbtest. This combination causes SunVTS to return incorrect errors.

ifbtest Test Requirements

Disable all screen savers before testing any graphics device. To disable the Solaris screen saver, type the following at a UNIX prompt:

```
# xset s off
```

To turn Power Management off, type the following at a UNIX prompt:

```
# xset -dpms
```

The display resolution must be 1024x768 or higher (the standard resolution). To change resolution, go to a UNIX prompt and type:

```
# fbconfig -res 1280x1024x76
```

For full instructions on testing frame buffers, see "Testing Frame Buffers" on page 10.

Preparation for `ifbtest`

You should complete a few steps in advance to ensure that `ifbtest` runs as smoothly as possible.

If you are running `ifbtest` in a window system (such as CDE):

- Turn Power Management off, if it is enabled. The following is an alternate way to turn Power Management off. Change `allowFBPM=1` to `allowFBPM=0` in `/platform/sun4u/kernal/drv/ifb.conf` file.
- Make sure that no other program is running that might modify the screen during the test.
- Make sure you have permission to lock the X server. `ifbtest` is designed to lock the X server during testing to prevent screen changes.
- The CDE login window should not be displayed during testing.
- Check that the window system is only running on one Expert3D frame buffer.

If you are not running `ifbtest` in a window system:

- Turn Power Management off, if it is enabled. The following is an alternate way to turn Power Management off. Change `allowFBPM=1` to `allowFBPM=0` in `/platform/sun4u/kernal/drv/ifb.conf` file.
- Make sure that no other program is running that might modify the screen during the test.
- Make sure the Expert3D frame buffer being tested is not the console device. Console messages may modify the screen.

ifbtest Options

To reach the dialog box below, right-click on the test name in the System Map and select Test Parameter Options. If you do not see this test in the System Map, you might need to expand the collapsed groups, or your system may not include the device appropriate to this test. Refer to the *SunVTS User's Guide* for more details.

By default, all `ifbtest` options are enabled.

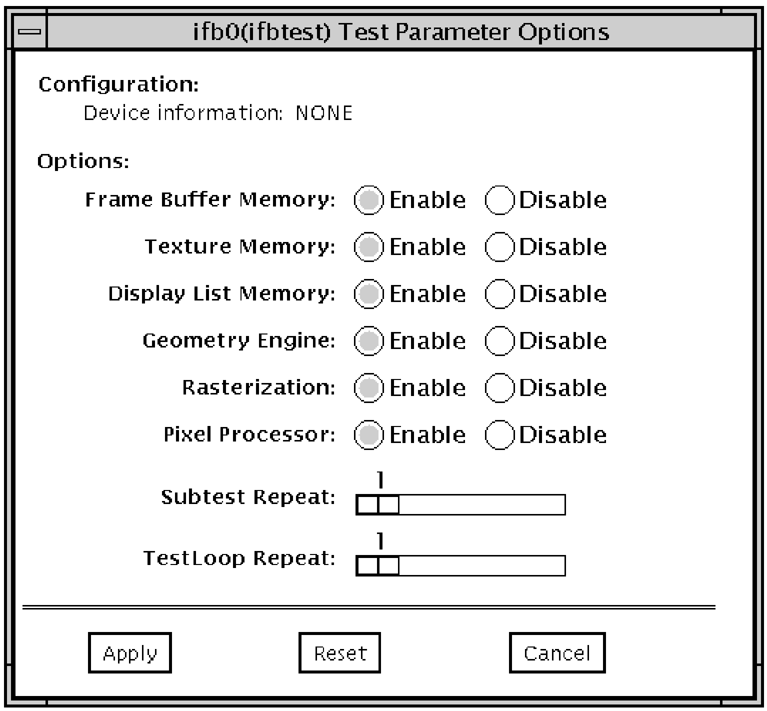


FIGURE 22-1 `ifbtest` Test Parameter Options Dialog Box

TABLE 22-1 `ifbtest` Options

`ifbtest` **Options**	**Description**
Frame Buffer Memory test	Thoroughly tests the Expert3D video memory by using read and write requests. Tests for shorts or failed connections on the data bus by writing the following values to every address: • `0xFFFFFFFF` • `0xFFFF0000` • `0x0000FFFF` • `0xFF00FF00` • `0x00FF00FF` • `0xF0F0F0F0` • `0x0F0F0F0F` • `0xCCCCCCCC` • `0x33333333` • `0xAAAAAAAA` • `0x55555555` Tests for shorts or failed connections on the address bus by writing the offset of each memory location to each location and reading them back. This may also catch speed-related problems due to the volume of read/writes. Errors in the test are reported as an error in a particular address, not attributed to a specific chip. To help distinguish bit-related errors, the errors are summarized to list which bits had at least one error in the test. This test shows on the screen as random pixels.
Texture Memory test	This test is identical in process to the frame buffer memory test (above). Since this test produces no visible effect, rectangles are drawn in rows across the screen to show progress.
Display List Memory test	This test is identical in process to the frame buffer memory and texture memory tests (above), and is applied to direct burst memory. This test takes little time and no progress is displayed.
Geometry Engine test	Loads diagnostic microcode into the geometry engine and confirms that the processor operates correctly. This is a pass/fail test. This test takes little time and no progress is displayed.

TABLE 22-1 `ifbtest` Options

`ifbtest` **Options**	**Description**
Rasterization test	Renders many primitives with minimal fragment processing, to test the rasterization of the primitives. The primitives used are: • Dots • Anti-aliased dots • Lines using all for line-drawing primitives • Anti-aliased lines using all for line-drawing primitives • Triangles, Quads, and Polygons in point, line, and fill modes • Rectangles This tests for the following rasterization attributes: • pixel coverage • constant value registers for color, Z, and stencil • interpolation of color, Z, and texture coordinates along lines and spans in polygons • texture map sampling Resulting images are compared against stored images. Errors indicate which operation type and value was being tested, and the coordinate of the failed pixel.

TABLE 22-1 `ifbtest` Options

`ifbtest` **Options**	**Description**
Pixel Processor test	Tries the various pixel processing operators using a variety of fragment values. This tests the following fragment processing operations: • Depth Buffering • Blending • Alpha Test • Color Test • Color Clamp • Logic Operations • Color Matrix and Bias • Color Table • Control Planes • Fast Clear • Stencil • Scissor Clipping • Desktop Clipping • Mask Clipping • Write Masks • Window Origin • Fog • Pixel Texture • Accumulation Buffer • Pixel Buffers Resulting images are compared against stored images. Errors indicate which operation type and value was being tested and the coordinate of the failed pixel.

`ifbtest` Test Modes

Due to the nature of graphic tests, reading data from, or writing data to the frame buffer during graphic tests will disturb user operation. For this reason, `ifbtest` is only available in Offline Functional test mode.

TABLE 22-2 `ifbtest` Supported Test Modes

Test Mode	Description
Functional (Offline)	Runs the full set of tests.

`ifbtest` Command-Line Syntax

`/opt/SUNWvts/bin/ifbtest` *standard_arguments* **`-o dev=`***device_name*, **`fbmem=`***E(nable)/D(isable)*,**`texmem=`***E/D*,**`dlmem=`***E/D*,**`geomeng=`***E/D*, **`rasterization=`***E/D*,**`pixelproc=`***E/D*,**`subtest_repeat=`***number*, **`test_repeat=`***number*

TABLE 22-3 `ifbtest` Command-Line Syntax

Argument	Description
`dev=`*device_name*	*device_name* is the relative path name of the device being tested with respect to `/dev/fbs`. There is no default.
`fbmem=`*E/D*	Enables or disables the frame buffer memory test.
`texmem=`*E/D*	Enables or disables the texture memory test.
`dlmem=`*E/D*	Enables or disables the display list memory test.
`geomeng=`*E/D*	Enables or disables the geometry engine test.
`rasterization=`*E/D*	Enables or disables the rasterization test.
`pixelproc=`*E/D*	Enables or disables the pixel processing test.
`subtest_repeat=`*number*	Defines the number of times to repeat each subtest. The default is 1.
`test_repeat=`*number*	Defines the number of times to repeat a test loop before passing. The default is 1.

Note – 64-bit tests are located in the `sparcv9` subdirectory: `/opt/SUNWvts/bin/sparcv9/`*testname*, or the relative path to which you installed SunVTS. If a test is not present in this directory, then it might be available as a 32-bit test only. For more information, see "32-Bit and 64-Bit Tests" on page 5.

CHAPTER 23

Intelligent Fibre Channel Processor Test (`ifptest`)

`ifptest` tests the functionality of the PCI FC-AL card when there are no devices attached to the loop. The driver checks for devices on the fibre loop. If devices are detected the driver blocks any diagnostic commands.

Note – When devices are attached to the loop, do not run `ifptest`. Instead, run `disktest` tests on the individual devices. This will test the whole subsystem including the FC-AL controller.

`ifptest` uses the "mailbox" interface to the card. This interface allows certain firmware operations to be performed that normally would not be available to the application layer.

`ifptest` Subtests

Four subtests are run in online and functional modes:

- Mailbox Loopback test

Loads a series of registers into the input mailboxes on the card and then reads the output mailboxes and compares results. This verifies that the system side of the card is operating correctly, and that the internal data paths are okay.

- Firmware revision check

Reads the firmware revision from the firmware and compares it against a revision loaded by the driver.

- Checksum firmware test

Runs an internal checksum test on the installed firmware. This verifies that the RISC RAM on the card is fully functional and that the installed firmware is still intact. This test also serves as a quick RAM check of the RISC RAM.

- Dump revision levels

Extracts the hardware and firmware revision levels of different submodules on the card.

`ifptest` Options

To reach the dialog box below, right-click on the test name in the System Map and select Test Parameter Options. If you do not see this test in the System Map, you might need to expand the collapsed groups, or your system may not include the device appropriate to this test. Refer to the *SunVTS User's Guide* for more details.

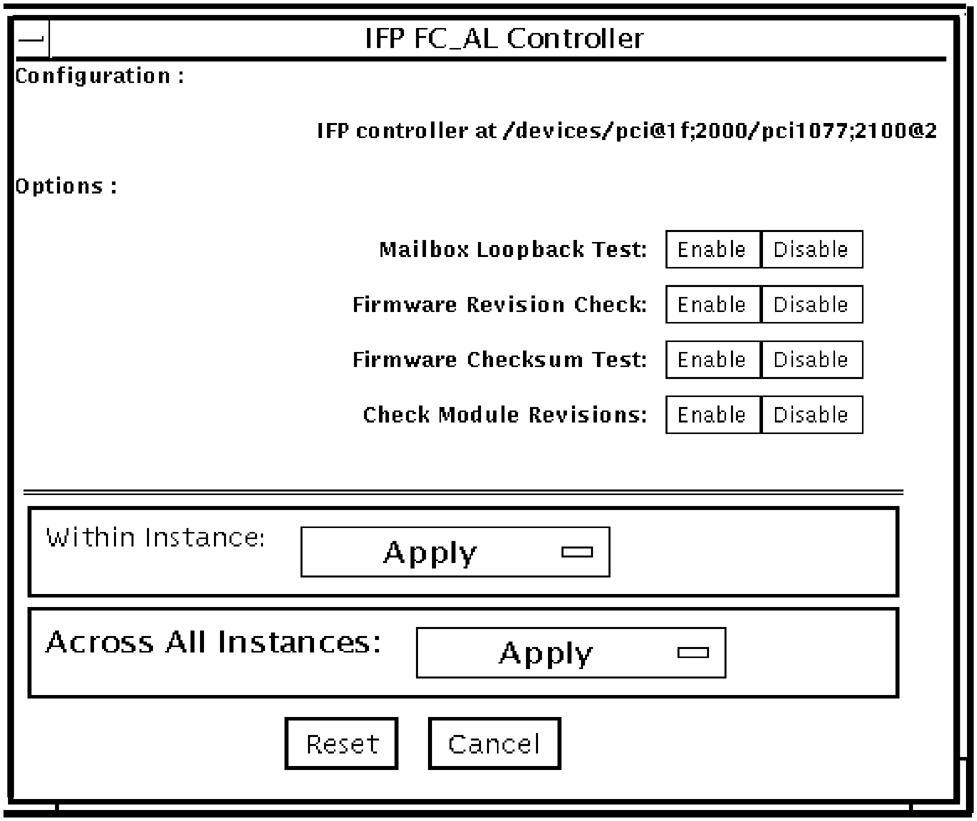


FIGURE 23-1 `ifptest` Test Parameter Options Dialog Box

TABLE 23-1 `ifptest` Options

`ifptest` **Options**	**Description**
Mailbox Loopback test	Enables or disables the mailbox loopback command. This test writes data patterns into the mailboxes and then reads them back from the output mailboxes and verifies the data is correct.

TABLE 23-1 `ifptest` Options

`ifptest` **Options**	**Description**
Firmware revision check	Enables or disables the firmware revision check command. This test extracts the firmware revision from the RISC firmware code and verifies against expected values.
Firmware checksum test	Enables or disables the firmware checksum command. This command instructs the interface's RISC processor to calculate the checksum on the current microcode and then compare it against the checksum that was loaded in with the microcode.
Check Module Revisions	Enables or disables the firmware check module command. This command returns the revision level of several submodules on the interface card. Although this test is executed when enabled, the module revision levels are only printed out in VERBOSE mode.

`ifptest` Test Modes

TABLE 23-2 `ifptest` Supported Test Modes

Test Mode	**Description**
Connection	Performs only an open/close operation.
Functional (Offline)	Runs the full set of mailbox tests.

Note – Connection test mode will only open the controller to verify that the path is still viable.

`ifptest` Command-Line Syntax

`/opt/SUNWvts/bin/ifptest` *standard_arguments*
`-o dev=`*device name***`,mbox=`***Enable*|*Disable***`,fwrevcheck=`***Enable*|*Disable***`,`**
`checksum=`*Enable*|*Disable***`,modrevcheck=`***Enable*|*Disable*

TABLE 23-3 `ifptest` Command-Line Syntax

Argument	Description
`dev=`	The name of the device to test.
`mbox=`*Enable*|*Disable*	Enables or disables the mailbox loopback command. This test writes data patterns into the mailboxes and then reads them back from the output mailboxes and verifies the data is correct.
`fwrevcheck=` *Enable*|*Disable*	Enables or disables the firmware revision check command. This test extracts the firmware revision from the RISC firmware code and verifies against expected values.
`checksum=` *Enable*|*Disable*	Enables or disables the firmware checksum command. This command instructs the interface's RISC processor to calculate the checksum on the current microcode and then compare it against the checksum that was loaded in with the microcode.
`modrevcheck=` *Enable*|*Disable*	Enables or disables the firmware checksum command. This command returns the revision level of several sub-modules on the interface card. Although this test is executed when enabled, the module revision levels are only printed out in VERBOSE mode.

Note – 64-bit tests are located in the `sparcv9` subdirectory: `/opt/SUNWvts/bin/sparcv9/`*testname*, or the relative path to which you installed SunVTS. If a test is not present in this directory, then it might be available as a 32-bit test only. For more information, see “32-Bit and 64-Bit Tests” on page 5.

CHAPTER 24

Integer Unit Test (`iutest`)

The Integer Unit Test (`iutest`) tests the resident integer unit in Sun SPARC CPUs. It exercises all of the register windows present in the Integer Unit of the CPU. The successful completion of the test implies that all of the register windows are functioning properly and failure implies a faulty register.

`iutest` Options

To reach the dialog box below, right-click on the test name in the System Map and select Test Parameter Options. If you do not see this test in the System Map, you might need to expand the collapsed groups, or your system may not include the device appropriate to this test. Refer to the *SunVTS User's Guide* for more details.

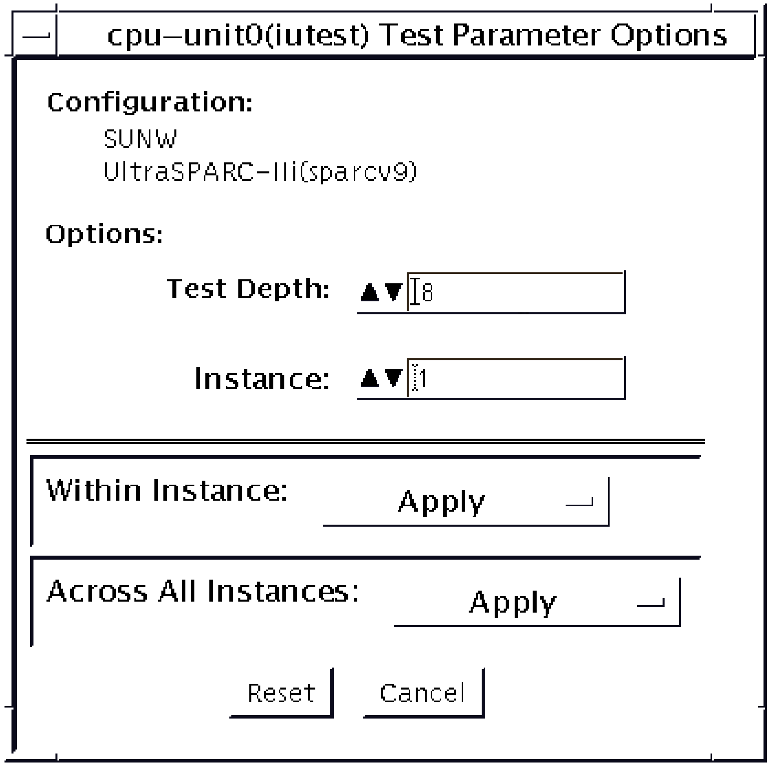


FIGURE 24-1 `iutest` Test Parameter Options Dialog Box

For the test options in the `iutest` Test Parameter Options dialog box, Test Depth is the only required option. Test Depth corresponds to the number of times that *all the register windows* are getting tested. The default, maximum and minimum values of the Test Depth are 8, 64, and 1 respectively.

iutest Test Modes

TABLE 24-1 iutest Supported Test Modes

Test Mode	Description
Connection	Displays the type of CPU implementation (for example, sparcv7 or sparcv9, etc.), the operating frequency, and CPU status (online, offline, etc.).
Functional (Offline)	Verifies all of the register windows and returns the appropriate error message if there is a faulty register. Otherwise, displays a successful test message.

iutest Command-Line Syntax

/opt/SUNWvts/bin/iutest *standard_arguments* **-o depth=***val*,**dev=cpu-unit***N*

In the iutest command-line syntax, *val* is the value of the Test_Depth parameter option as described in the preceding iutest options section. *N* is the CPU unit number (0,1,2, etc.). The test behavior is unpredictable if options other than those described in this section are entered.

Note – 64-bit tests are located in the sparcv9 subdirectory: /opt/SUNWvts/bin/sparcv9/*testname*, or the relative path to which you installed SunVTS. If a test is not present in this directory, then it might be available as a 32-bit test only. For more information, see "32-Bit and 64-Bit Tests" on page 5.

CHAPTER 25

Sun™ XVR-1200 Graphics Accelerator Test (jfbtest)

jfbtest verifies the proper functioning of the Sun™ XVR-1200 graphics accelerator.

jfbtest can detect and adapt to many video modes of the Sun XVR-1200 graphics accelerator. All tests can run at a resolution of 1024x768 or higher.

You can interrupt jfbtest using Control-C.

Test accuracy is checked using direct image comparison against compressed images. Failed pixel locations are printed as error messages.

Caution – Do not run any other application or screen saver program that uses the Sun XVR-1200 graphics accelerator port while running jfbtest. This combination causes SunVTS to return incorrect errors.

jfbtest Test Requirements

Disable all screen savers before testing any graphics device. To disable the Solaris screen saver, type the following at a UNIX prompt:

```
# xset s off
```

To turn Power Management off, type the following at a UNIX prompt:

```
# xset -dpms
```

The display resolution must be 1024x768 or higher (the standard resolution). To change resolution, go to a UNIX prompt and type:

```
# fbconfig -res 1280x1024x76
```

For full instructions on testing frame buffers, see "Testing Frame Buffers" on page 10.

Preparation for `jfbtest`

You should complete a few steps in advance to ensure that `jfbtest` runs as smoothly as possible.

If you are running `jfbtest` in a window system (such as CDE):

- Turn Power Management off, if it is enabled. The following is an alternate way to turn Power Management off. Change `allowFBPM=1` to `allowFBPM=0` in `/platform/sun4u/kernal/drv/jfb.conf` file.
- Make sure that no other program is running that might modify the screen during the test.
- Make sure you have permission to lock the X server. `jfbtest` is designed to lock the X server during testing to prevent screen changes.
- The CDE login window should not be displayed during testing.
- Check that the window system is only running on one Sun XVR-1200 graphics accelerator.

If you are not running `jfbtest` in a window system:

- Turn Power Management off, if it is enabled. The following is an alternate way to turn Power Management off. Change `allowFBPM=1` to `allowFBPM=0` in `/platform/sun4u/kernal/drv/jfb.conf` file.
- Make sure that no other program is running that might modify the screen during the test.
- Make sure the Sun XVR-1200 graphics accelerator being tested is not the console device. Console messages may modify the screen.

jfbtest Options

To reach the dialog box below, right-click on the test name in the System Map and select Test Parameter Options. If you do not see this test in the System Map, you might need to expand the collapsed groups, or your system may not include the device appropriate to this test. Refer to the *SunVTS User's Guide* for more details.

By default, all jfbtest options are enabled.

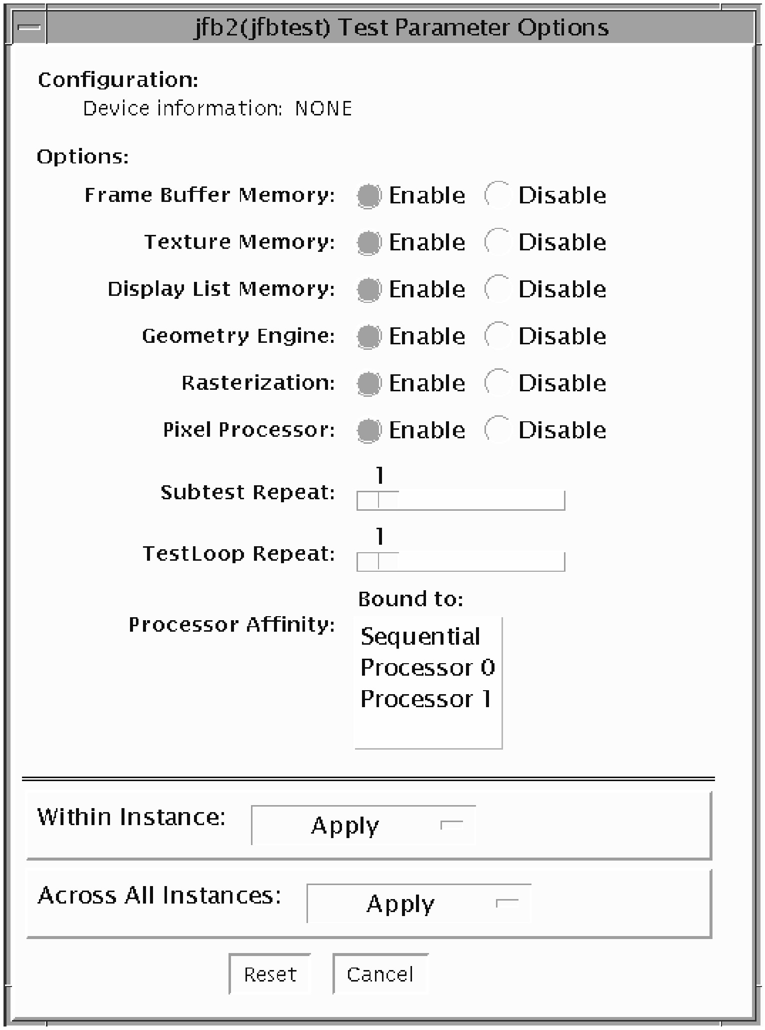


FIGURE 25-1 `jfbtest` Test Parameter Options Dialog Box

TABLE 25-1 `jfbtest` Options

`jfbtest` **Options**	**Description**
Frame Buffer Memory test	Thoroughly tests the Sun XVR-1200 video memory by using read and write requests. Tests for shorts or failed connections on the data bus by writing the following values to every address: • `0xFFFFFFFF` • `0xFFFF0000` • `0x0000FFFF` • `0xFF00FF00` • `0x00FF00FF` • `0xF0F0F0F0` • `0x0F0F0F0F` • `0xCCCCCCCC` • `0x33333333` • `0xAAAAAAAA` • `0x55555555` Tests for shorts or failed connections on the address bus by writing the offset of each memory location to each location and reading them back. This may also catch speed-related problems due to the volume of read/writes. Errors in the test are reported as an error in a particular address, not attributed to a specific chip. To help distinguish bit-related errors, the errors are summarized to list which bits had at least one error in the test. This test shows on the screen as random pixels.
Texture Memory test	This test is identical in process to the Frame Buffer Memory test (above). Since this test produces no visible effect, rectangles are drawn in rows across the screen to show progress.
Display List Memory test	This test is identical in process to the Frame Buffer Memory and Texture Memory tests (above), and is applied to direct burst memory. This test takes little time and no progress is displayed.
Geometry Engine test	Loads diagnostic microcode into the geometry engine and confirms that the processor operates correctly. This is a pass/fail test. This test takes little time and no progress is displayed.

TABLE 25-1 `jfbtest` Options

`jfbtest` **Options**	**Description**
Rasterization test	Renders many primitives with minimal fragment processing, to test the rasterization of the primitives. The primitives used are: • Dots • Anti-aliased dots • Lines using all for line-drawing primitives • Anti-aliased lines using all for line-drawing primitives • Triangles, Quads, and Polygons in point, line, and fill modes • Rectangles This tests for the following rasterization attributes: • Pixel coverage • Constant value registers for color, Z, and stencil • Interpolation of color, Z, and texture coordinates along lines and spans in polygons • Texture map sampling Resulting images are compared against stored images. Errors indicate which operation type and value was being tested, and the coordinate of the failed pixel.

TABLE 25-1 `jfbtest` Options

`jfbtest` **Options**	**Description**
Pixel Processor test	Tries the various pixel processing operators using a variety of fragment values. This tests the following fragment processing operations: • Depth Buffering • Blending • Alpha Test • Color Test • Color Clamp • Logic Operations • Color Matrix and Bias • Color Table • Control Planes • Fast Clear • Stencil • Scissor Clipping • Desktop Clipping • Mask Clipping • Write Masks • Window Origin • Fog • Pixel Texture • Accumulation Buffer • Pixel Buffers Resulting images are compared against stored images. Errors indicate which operation type and value was being tested and the coordinate of the failed pixel.

`jfbtest` Test Modes

Due to the nature of graphic tests, reading data from, or writing data to the frame buffer during graphic tests will disturb user operation. For this reason, `jfbtest` is only available in Functional test mode.

TABLE 25-2 `jfbtest` Supported Test Modes

Test Mode	Description
Functional	Runs the full set of tests.
Connection	Runs the full set of tests.

`jfbtest` Command-Line Syntax

`/opt/SUNWvts/bin/jfbtest` *standard_arguments* **`-o dev=`***device_name*, **`fbmem=`***E(nable)/D(isable)*,**`texmem=`***E/D*,**`dlmem=`***E/D*,**`geomeng=`***E/D*, **`rasterization=`***E/D*,**`pixelproc=`***E/D*,**`subtest_repeat=`***number*, **`test_repeat=`***number*

TABLE 25-3 `jfbtest` Command-Line Syntax

Argument	Description
`dev=`*device_name*	*device_name* is the relative path name of the device being tested with respect to `/dev/fbs`. There is no default.
`fbmem=`*E/D*	Enables or disables the Frame Buffer Memory test.
`texmem=`*E/D*	Enables or disables the Texture Memory test.
`dlmem=`*E/D*	Enables or disables the Display List Memory test.
`geomeng=`*E/D*	Enables or disables the Geometry Engine test.
`rasterization=`*E/D*	Enables or disables the Rasterization test.
`pixelproc=`*E/D*	Enables or disables the Pixel Processing test.
`subtest_repeat=`*number*	Defines the number of times to repeat each subtest. The default is 1.
`test_repeat=`*number*	Defines the number of times to repeat a test loop before passing. The default is 1.

Note – 64-bit tests are located in the `sparcv9` subdirectory: `/opt/SUNWvts/bin/sparcv9/`*testname*, or the relative path to which you installed SunVTS. If a test is not present in this directory, then it might be available as a 32-bit test only. For more information, see "32-Bit and 64-Bit Tests" on page 5.

CHAPTER **26**

JNI 2GB FC HBA Test (`jnifctest`)

The `jnifctest` tests the functionality of the JNI FC HBA. There are three tests: a self-test, an internal loopback test, and an external loopback test. The self-test tests the internal consistency of the board's internal computer. The loopback tests send out blocks of data to the HBA, receives blocks echoed back to the HBA, and compares the echoed packets to the original. If `jnifctest` detects problems in the self-test, problems sending or receiving the data, or any changes in the content of the data in the loopback tests, it sends out a descriptive error message to the SunVTS console and error log.

There are a small list of patterns that are most likely to detect problems on a FC network; these "critical" patterns are the default. There is also a longer list of patterns and a means for a user to input his own data pattern for testing.

Internal loopback tests require having a loopback plug or cable connected to the port. External loopback tests can be run on a port connected to storage, to a switch, or with a loopback plug or cable. The simplest way to get the greatest test coverage is to have all ports connected with a cable and run both the self-test and the external loopback test. These two tests are enabled by default.

The `jnifctest` runs in exclusive mode. Any storage behind a particular port will be inaccessable while the tests are running. Also, system console log messages reporting renegotiation of the link status may be generated for ports connected to a switch or storage when `jnifctest` is run.

`jnifctest` has three subtests available:

- Online selftest
- Internal loopback test
- External loopback test

`jnifctest` Options

To reach the dialog box below, right-click on the test name in the System Map and select Test Parameter Options. If you do not see this test in the System Map, you might need to expand the collapsed groups, or your system may not include the device appropriate to this test. Refer to the *SunVTS User's Guide* for more details.

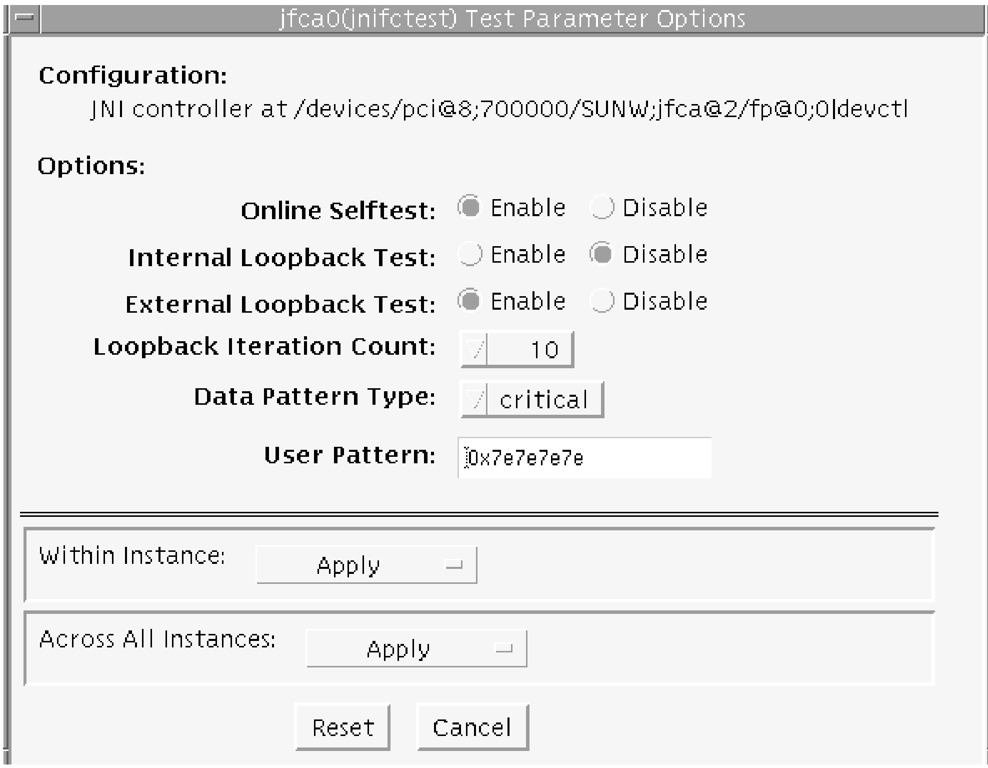


FIGURE 26-1 `jnifctest` Test Parameter Options Dialog Box

TABLE 26-1 `jnifctest` Options

`jnifctest` **Options**	**Description**
Online Selftest	Enable or Disable the board self-test.
Internal Loopback Test	Enable or Disable the internal loopback test.
External Loopback Test	Enable or Disable the external loopback test.

TABLE 26-1 `jnifctest` Options *(Continued)*

`jnifctest` **Options**	**Description**
Loopback Iteration	Number of iterations to run the loopback test.
Data Pattern Type:	What type of data to send in the loopback tests. *Critical* patterns are a dozen patterns which are optimized to cause errors in marginal FC networks. With a small number of patterns, the test will run more rapidly. *All* patterns is a list of approximately 256 patterns, including the *Critical* patterns. The *User* pattern is a single pattern that you can specify to test with.
User Pattern	A 32-bit data pattern which is used if 'user' is specified in the Data Pattern Type option. The *User Pattern* should be input in the form 0x12345678

The default values are for the Online Selftest and External Loopback test to be enabled. The Internal Loopback test is disabled. The Loopback Iteration count defaults to 10 iterations. The default Data Pattern Type is *Critical* and the default *User Pattern* is 0x7e7e7e7e.

`jnifctest` Supported Test Modes

TABLE 26-2 `jnifctest` Supported Test Modes

Test Mode	Description
Exclusive	Runs full set of tests.

`jnifctest` Command-Line Syntax

/opt/SUNWvtshm/bin/jnifctest -vf -o dev=*jfca0*, **selftest=**{enable|disable}, **ilb=**{enable|disable}, **elb=**{enable|disable}, **iterations=**{1 – 1000000}, **selectpattern=**{critical|all|user}, **userpattern=**{*hex-value*}

TABLE 26-3 `jnifctest` Command-Line Syntax

Argument	Description
dev=device	Specifies device to be tested—for example, jfca0, jfca1, and so on.
selftest**=***Enable* | *Disable*	Enables or disable the self-test.
ilb=*Enable* | *Disable*	Enables or disables the Internal loopback test.
elb=*Enable* | *Disable*	Enables or disables the External loopback test.
iterations= *1 – 1000000*	Specifies the number of iterations of the tests. The possible range of this parameter is 1 – 1,000,000. The most practical range is 10 – 5000.
selectpattern=*user* | *critical* | *all*	Specifies which data patterns are used for the loopback tests: the small list of critical hex-value data patterns, or the larger list of all hex-value data patterns. The critical hex-value data pattern list is 12 hex-value patterns. The all hex-value data pattern is a significantly larger list of hex-value data patterns.
userpattern=*hex-value*	If the `selectpattern` option is specified as *user*, this option specifies the data pattern that should be used for the loopback tests. The hex-value pattern is specified with 8 hex digits—for example, 0x12345678, 0x7e7e7e7e, or 0xcafebaba.

CHAPTER 27

Level 1 Data Cache Test (`l1dcachetest`)

`l1dcachetest` exercises the level1 Data cache in the CPU module of Sun systems. The test writes, reads, and verifies access of multiple virtual addresses. The virtual addresses are so chosen that they cause targeted hits and misses in the cache. The test dynamically determines the size and organization of the cache and tunes the test accordingly to be effective on the l1dcache.

`l1dcachetest` provides data path testing of on-chip buses. With rapid move to deep sub-micron (DSM) designs, GHz clock frequencies, feature size process of 0.18 micron and below, ensuring the integrity of signals as they traverse conductors on a chip is becoming challenge. `l1dcachetest` subtests induce crosstalk noise in on-chip data buses by using Maximum Aggressor Fault (MAF) models.

`l1dcahetest` is self scaling and adaptive. It scales with the size of system. `l1dcachetest` is mult-threaded. Although, selection of CPU IDs, is kept as one of the options but if its not specified, it automatically retrieves the number of CPUs in the system and internally creates that many threads of `l1dcachetest` to give coverage to the whole system at a given time. The test also determines the sizes and organization of l1cache.

`l1dcachetest` Options

To reach the dialog box below, right-click on the test name in the System Map and select Test Parameter Options. If you do not see this test in the System Map, you might need to expand the collapsed groups, or your system may not include the device appropriate to this test. Refer to the *SunVTS User's Guide* for more details.

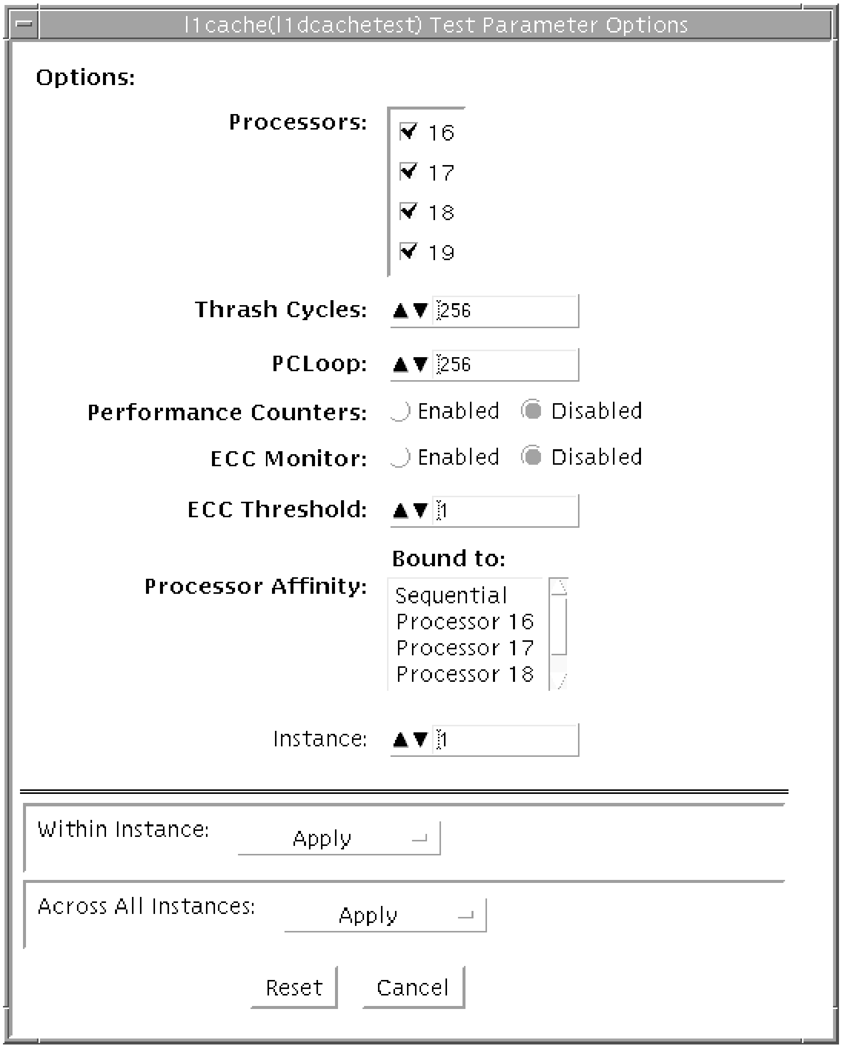


FIGURE 27-1 `l1dcachetest` Test Parameter Options Dialog Box

TABLE 27-1 `l1dcachetest` Options

Option	Description
Processors	This option can be used to select the CPU IDs for which to run this test. The test will use all CPUs on the system by default. Hence this parameter is optional.
Thrash Cycles	Specifies the number of iteration for data cache subtests. The default is 256.
PCLoop	Specifies the number of iteration for Prefetch Cache Subtests. The default is 256. (NOTE : This option will only be displayed on system with UltraSPARC-III and UltraSPARC-IV family of processors.
ECC Error	Specifies whether the error messaging should be on or off. The error monitor monitors the /var/adm/messages file for failure messages which could be caused during test. The default is OFF.
ECC Threshold	Specifies the threshold value of the number of errors after which the test would register an error. This argument is only applicable, if the Error Monitor is on. The errors that come on the `/var/adm/messages` could be correctable errors, that is why the threshold value is provided to give facility to ignore the errors if they are below the threshold value. The default value is 1.
Performance Counters	Enables or Diables the Performance counter measurements related to Data Cache and Prefetch Cache events. By Default, it is OFF.

Note – Only one `l1dcachetest` will be registered for all the CPUs in the system.

Note – The `l1dcachetest` is automatically bound to a processor. Users are advised to not use the Processor Affinity option for the `l1dcachetest`.

`l1dcachetest` Test Modes

TABLE 27-2 `l1dcachetest` Supported Test Modes

Test Mode	Description
Connection	Performs the Connection subtest.
Exclusive	Performs only the `l1dcachetest` (full test).

`l1dcachetest` Command-Line Syntax

/opt/SUNWvts/bin/l1dcachetest *standard_arguments* **-o [** **[M=***1+2+3...* **]**,**[count**=*number* **]**, **[pcloop**=*number*], [**em**=*Enabled|Disabled*], [**threshold**=*1,255*], [**perf**=*Enabled|Disabled*], [**dev**=*l1cache*]]

TABLE 27-3 `l1dcachetest` Command-Line Syntax

Argument	Description
M=*1+2+3...*	This option can be used to select the CPU IDs for which to run this test. The test will use all CPUs on the system by default. Hence this parameter is optional. The CPU IDs currently present in the system can be retrieved with psrinfo(1M) command. Specifying a CPU ID not present in the system or one which is currently offline induces an appropriate error messages from the test. Example: If you want to select CPU IDs 4, 5, 6, and 7 , specify : M=4+5+6+7
count=*number*	Specifies the number of iteration for Data Cache Subtests. The default is 256.
pcloop=*number*	Specifies the number of iteration for Prefetch Cache Subtests. The default is 256. (NOTE : This option s only for system with UltraSPARC-III and UltraSPARC-IV family of processors. For others, it will ignored.
em=*Enabled|Disabled*	Specifies whether the error messaging should be on or off. The error monitor monitors the `/var/adm/messages` file for failure messages which could be caused during test. The default is OFF.

TABLE 27-3 `l1dcachetest` Command-Line Syntax

Argument	Description
`threshold`=*1,255*	Specifies the threshold value of the number of errors after which the test would register an error. This argument is only applicable, if the Error Monitor is on. The errors that come on the `/var/adm/messages` could be correctable error, that is why threshold value is provided for the user to give facility to ignore the errors if they are below thrshold value. The default value is 1. If set to zero, the test will still report errors but will not stop.
`perf`= *Enabled* | *Disabled*	Enables or Diables the Performance counter measurements related to Data Cache and Prefetch Cache events. By Default, it is OFF.
`dev`=*l1cache*	Specifies the device. The default is l1cache.

Note – If you do not mention the value for `count` or `pcloop`, the test will run with the default value of `count` and `pcloop`. To disable Data Cache subtests, specify `count=0`, and for Prefetch Catch subtests, specify `pcloop=0`.

Note – Command line syntax still supports old command line syntax, but this will not be supported in a fulure release of SunVTS.

Note – 64-bit tests are located in the `sparcv9` subdirectory: `/opt/SUNWvts/bin/sparcv9/`*testname*, or the relative path to which you installed SunVTS. If a test is not present in this directory, then it might be available as a 32-bit test only. For more information, see “32-Bit and 64-Bit Tests” on page 5.

CHAPTER 28

Level 2 Cache Test (`l2sramtest`)

`l2sramtest` exercises the level2 cache in the CPU module of Sun systems. In most CPUs, the level2 cache is also the external cache, but in some cases the level2 cache is on the chip. This test writes, reads, and verifies access of multiple virtual addresses. This test contains multiple subtests that try to exercise the l2cache by causing hits/misses, performing marching patterns on the l2cache cells, and writing patterns that cause electrical stress.

`l2sramtest` is self scaling and adaptive. It scales with the size of the system. It will automatically retrieve the number of CPUs in the system and internally create that many threads of `l2sramtest` to give coverage to the whole system at a given time. This test also dynamically determines the size and organization of the l2cache. The user does not have to input these values.

`l2sramtest` Options

To reach the dialog box below, right-click on the test name in the System Map and select Test Parameter Options. If you do not see this test in the System Map, you might need to expand the collapsed groups, or your system may not include the device appropriate to this test. Refer to the *SunVTS User's Guide* for more details.

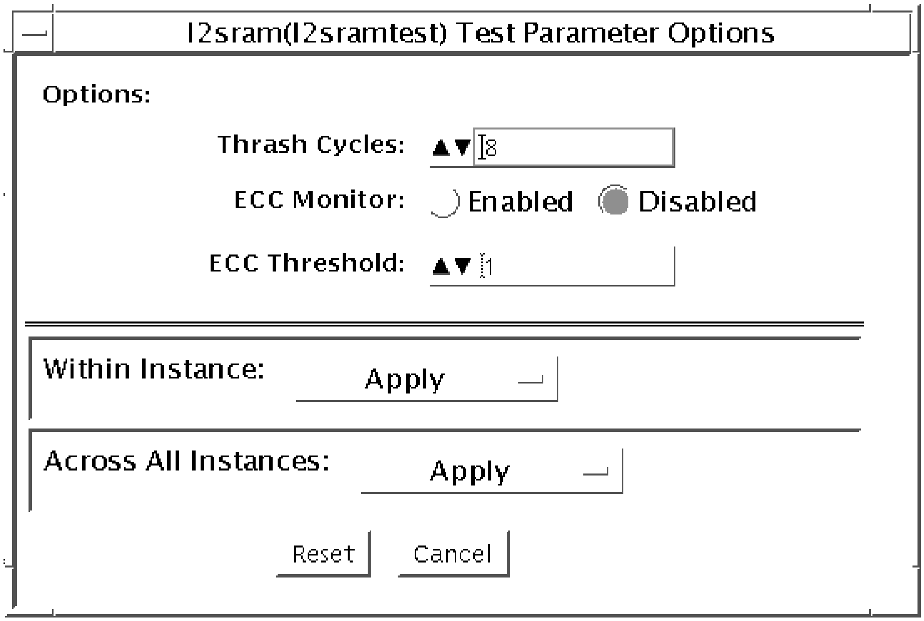


FIGURE 28-1 `l2sramtest` Test Parameter Options Dialog Box

TABLE 28-1 `l2sramtest` Options

Option	Description
Thrash Cycles	Specifies the number of thrashing cycles the test completes for the level2 cache on the system. The default value is 8.
ECC Error Monitor	Specifies whether the error monitoring should be on or off. The error monitor monitors the `/var/adm/messages` file for failure messages which could be caused due to the test. The default value is OFF.
Threshold	Specifies the threshold value of the number of errors after which the test would register an error. This argument is only applicable if the Error Monitor option is ON. The errors that come on the `/var/adm/messages` could be correctable error, that is why the threshold value is provided for the user to give a facility to ignore the errors if they are below the threshold value. The default value is 1.

Note – The `l2sramtest` automatically handles processor binding. Users are advised to not use the Processor Affinity option for the `l2sramtest`.

`l2sramtest` Test Modes

TABLE 28-2 `l2sramtest` Supported Test Modes

Test Mode	Description
Exclusive	Performs only the `l2sramtest` (full test).

`l2sramtest` Command-Line Syntax

/opt/SUNWvts/bin/sparcv9/l2sramtest -*standard_arguments* **-o** [**dev=***l2sram*, **count=***[1...1023]*, **em=***[Enabled,Disabled]*, **threshold=***[0..255]]*

Note – The `l2sramtest` is not a per CPU test. There will be only one `l2sramtest` for the whole system (one image of Solaris). It will run on all the CPUs of the domain.

TABLE 28-3 `l2sramtest` Command-Line Syntax

Argument	Description
dev=*l2sram*	Specifies the device. The default value is `l2sram`.
count=*number*	Specifies the number of thrashing cycles that the test completes for the level2 cache on the system. Default value for Offline mode is 8.
em=*Enabled/Disabled*	Specifies the enabling or disabling of the ECC Error Monitor. The default value is Disabled.
threshold=*number*	Specifies the threshold value of how many correctable ECC errors can occur in the elapsed time before `l2sramtest` reports a test failure. The default value is 1.

CHAPTER **29**

LOMlite Alarm Test (`lomlitetest`)

`lomlitetest` tests the functionality of LOMlite and LOMlite 2 system monitoring, alarms, and lights-out management (LOM) processors currently used in Netra™ T platforms. This test also tests the legacy TSalarms alarm card used in some Netra t 11xx systems. `lomlitetest` exercises the hardware and device drivers for the LOMlite, LOMlite 2, or TSalarms device, and tests the system and environmental monitoring functions of the device.

This test is not scalable.

Note – During offline functional testing, messages from the LOM processor are seen on the system console. This is normal and does not indicate a fault.

`lomlitetest` Requirements

- The LOMlite or TSalarms device driver must be installed
- In the Netra t 11xx or Netra t 14xx platforms, the LOMlite or TSalarms plug-in card must be installed

`lomlitetest` Subtests

TABLE 29-1 `lomlitetest` Subtests

Subtest	Description
Connection subtest	Run for both LOMlite and TSalarms. Attempts to open the device nodes appropriate to the device being tested.
Passive Read subtest	Attempts to read the available data from the device being tested. Device data is read as follows: All devices: Alarm state LOMlite and LOMlite 2: ■ Fault LED state ■ Power supply state ■ Fans state ■ EEPROM event log LOMlite 2 only: ■ Power supply voltages ■ Enclosure and CPU temperatures
Active Alarms subtest	Reads, inverts, and re-reads each alarm state to ensure change took effect. Resets alarms to original state and checks that the state is correct. In the case of LOMlite and LOMlite 2 devices, reads the EEPROM event log and ensures that the expected events are recorded.
Active Fault LED subtest	Reads, inverts, rereads and resets the state of the fault indicator LED. Checks that the state changes are recorded in the EEPROM event log.

`lomlitetest` Options

This test has no programmable options unless it is run on a multi-processor system. On single-processor systems, the appropriate subtests are automatically selected depending upon the test mode and the type of device detected or specified on the command line.

FIGURE 29-1 shows the options menu for a multi-processor system. To reach the dialog box below, right-click on the test name in the System Map and select Test Parameter Options. If you do not see this test in the System Map, you might need to expand the collapsed groups, or your system may not include the device appropriate to this test. Refer to the *SunVTS User's Guide* for more details.

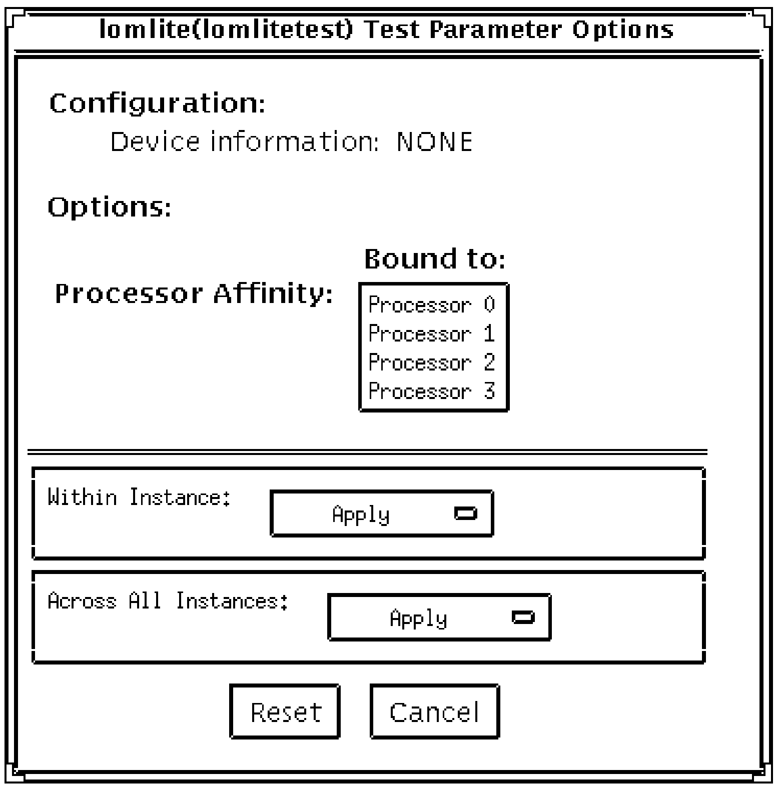


FIGURE 29-1 `lomlitetest` Test Parameter Options Dialog Box

`lomlitetest` Test Modes

TABLE 29-2 `lomlitetest` Supported Test Modes

Test Mode	Description
Connection	Runs the Connection subtest.
Functional (Offline)	Runs all subtests.

`lomlitetest` Command-Line Syntax

`/opt/SUNWvts/bin/lomlitetest` *standard_arguments*
`-o dev=`*lomlite2* | *lomlite* | *tsalarms*

TABLE 29-3 `lomlitetest` Command-Line Syntax

Argument	Description
`dev=` *lomlite2* | *lomlite* | *tsalarms*	Selects the type of device driver to test.

CHAPTER **30**

M64 Video Board Test (`m64test`)

`m64test` tests the PCI-based M64 video board by performing the following subtests:

- Video Memory test
- RAMDAC test
- Accelerator Port test

Caution – *Do not* run any other application or screen saver program that uses the M64 video board while running `m64test`. Do not run Power Management™ software. These programs cause SunVTS to return incorrect errors.

Note – Disable all screen savers before testing any graphics device. Type **`xset s off`** at a UNIX prompt to disable the Solaris screen saver. Type **`xset -dpms`** (to turn off power management) or type **`xset s noblank`** (to turn off screen saver). Disable Power Management software if it is running.

Note – To start SunVTS with `vtsui`, but without `vtsk`, you must add the host name to `xhost` as: **`xhost +`** *hostname.*

For full instructions on testing frame buffers, see "Testing Frame Buffers" on page 10.

`m64test` Options

To reach the dialog box below, right-click on the test name in the System Map and select Test Parameter Options. If you do not see this test in the System Map, you might need to expand the collapsed groups, or your system may not include the device appropriate to this test. Refer to the *SunVTS User's Guide* for more details.

By default, all options are enabled except frame buffer locking.

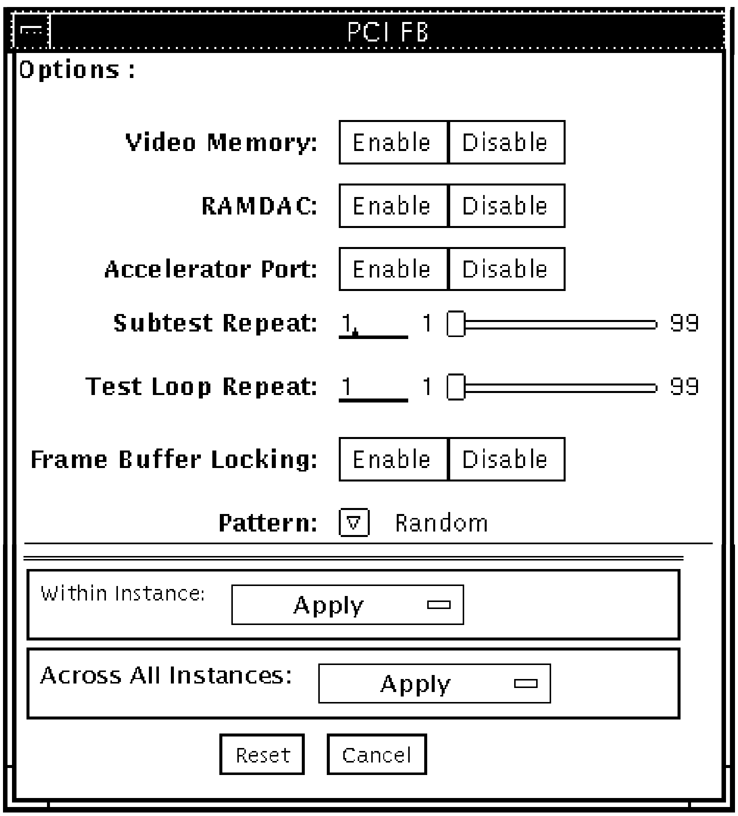


FIGURE 30-1 `m64test` Test Parameter Options Dialog Box

TABLE 30-1 `m64test` Options

`m64test` **Options**	**Description**
Video Memory test	Thoroughly tests the on-screen video memory (the memory part that is mapped on to the monitor) of the M64 video board in 8-bit, 16-bit, 32-bit, 64-bit, and 64 byte (block) modes. Entire on-screen video memory is tested by testing 512 bit blocks at a time (8x8 pixel block). Each block is tested in two passes. Each pass consists of a data write and read. In the first pass user specified data or random data is used and in the second pass one’s complement of the data used in the first pass is used so that each on-screen video memory location (bit) is tested with a zero (electrical low state) and one (electrical high state).
RAMDAC test	Tests the RAMDAC in three phases. In the first phase the RAMDAC CLUT (Color LookUp Table) is tested using simple write/read patterns to determine if there are any bad bits in CLUT. The data patterns used are: • Random data • Complement of the random data (used as first data pattern) • The data pattern 0101 • The data pattern 10101 In the second phase, four different patterns are drawn on the screen. Each pattern stays on the screen for approximately three seconds. The four patterns are listed below. For each pattern the signature is captured and compared with the signature obtained for the same pattern on a known good board. This test verifies that all the different data paths within the RAMDAC are functioning properly. Patterns drawn on screen: • Red ramp with cursor at top-left corner of the screen • Blue ramp with cursor at top-right corner of the screen • Green ramp with cursor at bottom-left of the screen • Grey ramp with cursor at bottom-right of the screen In the last (third) phase of the RAMDAC test the Vertical Retrace Interrupt is tested for 300 interrupts.

TABLE 30-1 `m64test` Options

`m64test` **Options**	**Description**
Accelerator Port test	Tests all of the following: • Data paths (sources: fixed color, host data, blit, fixed pattern) • Arithmetic and logic unit (ALU) • Color comparator • Primitives (destinations: line, rectangle) • Mono to color expansion logic Primitives are drawn using a combination of different data paths (allowed), ALU functions, and color comparator functions. A checksum is generated for each data combination and is compared with the checksum generated for the same data combination on a known good board.
Frame Buffer Locking	This option is set to *disable* if the M64 is not the console device. When Sunvts GUI is brought up FB Locking is enabled by default if M64 is console device. If M64 is not console device, FB Locking is disabled by default.

`m64test` Test Modes

Due to the nature of graphics tests, reading from or writing to the frame buffer during graphics tests will disturb user operation. This test is only available in the Offline Functional test mode.

TABLE 30-2 `m64test` Supported Test Modes

Test Mode	**Description**
Functional (Offline)	The `m64test` verifies the M64 video board.

`m64test` Command-Line Syntax

`/opt/SUNWvts/bin/m64test` *standard_arguments* **`-o dev=`***device_name***`, S=`***subtest_number***`,F=`***#_of_subtest_loops***`,B=`***#_of_test_loops***`,L=`***disable***`,P=`***test_pattern*

TABLE 30-3 `m64test` Command-Line Syntax

Argument	Description
dev=*device_name*	*device_name* is the relative path name of the device being tested with respect to /dev/fbs. The default is m640.
S=*subtest_number*	*subtest_number* is the test number of the subtest to be run. Select from the subtests below. You can run multiple subtests by adding the subtest numbers. For example, `n=0x00003` runs both test 00001 and test 00002; `n=0x00005` runs both test 0x00001 and test 0x00004. Note that you do not need the leading zeros. • `n—0x00001 VRAM` • `n—0x00002 RAMDAC` • `n—0x00004 Accelerator port test (Rendering Pipeline)` More than one test can be selected by ORing subtest numbers. For example: n = 0x00005 means VRAM and Rendering Pipeline tests. A hex number must be preceded by 0x, decimal numbers are also acceptable.
F=*#_of_subtest_loops*	Specifies the number of times to repeat each subtest. The default is 1.
B=*#_of_test_loops*	Specifies the number of times to repeat a test loop before passing; default is 1.
L=*disable*	Disables the frame buffer lock. Disable the lock when the m64 is not the console or when the server is not running on the m64 under test.
P=*test_pattern*	Specifies the test pattern number. The default is `r`, for random patterns. You may also choose `0 for 0x0000000`, `3 for 0x3333333`, `5 for 0x5555555`, or `9 for 0x9999999`.

Note – 64-bit tests are located in the `sparcv9` subdirectory: `/opt/SUNWvts/bin/sparcv9/`*testname*, or the relative path to which you installed SunVTS. If a test is not present in this directory, then it might be available as a 32-bit test only. For more information, see "32-Bit and 64-Bit Tests" on page 5.

Note – Errors returned by `m64test` are nonspecific. It is not possible to determine which component caused a failure. In all error conditions, the field replaceable unit (FRU) is the entire M64 video board.

CHAPTER **31**

Multiprocessor Test (`mptest`)

The `mptest` verifies the hardware functionality of multiprocessor hardware. The test provides diagnostic test coverage for different aspects of multiprocessor functionality like E-Cache Coherency, Synchronization Primitives, I/O Cache Coherency and Shared Memory, and Interprocessor Interrupts.

The `mptest` is adaptive to different cache size and line sizes. The test causes cache coherency operations for E-Cache and I/O Cache. It also tests the synchronization primitives provided by the `sparcv8/sparcv9` architecture.

Note – `mptest` is not supported on sun4m platforms in SunVTS 5.1 PS6 onward.

Caution – `mptest` by default selects the CPUXCall class of test method. If CPUXCall is selected, and mptest is run, the machine might seem hung for a few minutes. The duration is dependent on the number of CPUs.

`mptest` Options

To reach the dialog box below, right-click on the test name in the System Map and select Test Parameter Options. If you do not see this test in the System Map, you might need to expand the collapsed groups, or your system may not include the device appropriate to this test. Refer to the *SunVTS User's Guide* for more details.

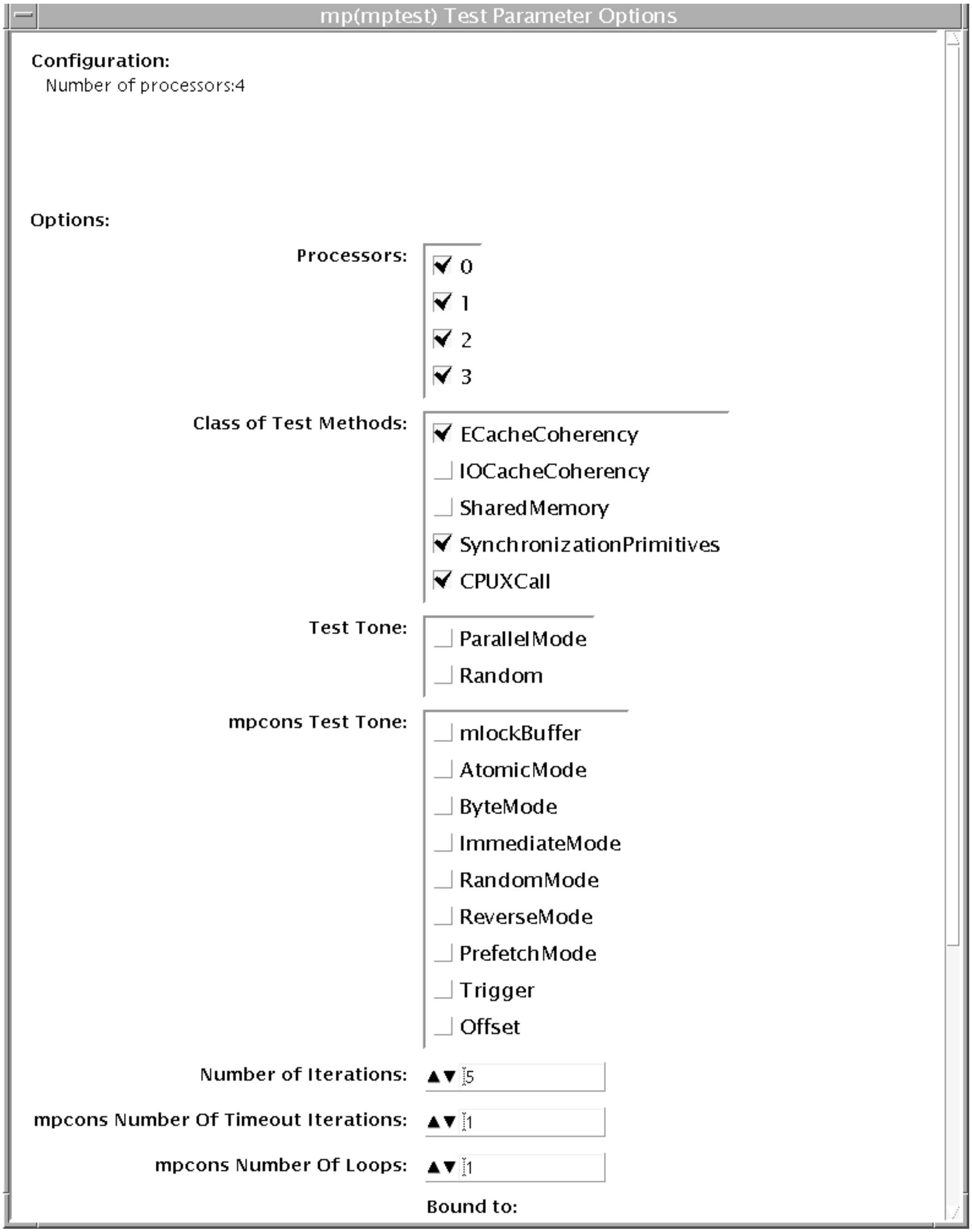


FIGURE 31-1 `mptest` Test Parameter Options Dialog Box

The processors that can be tested are listed in the Configuration area of the menu. You can enable or disable the multiprocessing test for individual processors on this menu.

The options listed in TABLE 31-1 can be run alone or concurrently with other options.

TABLE 31-1 `mptest` Options

`mptest` **Options**	**Description**
Processors	This option can be used to select the CPU IDs for which to run this test. The test will use all CPUs on the system by default. Hence, this parameter is optional. The CPU IDs currently present in the system can be retrieved with the `psrinfo`(1M) command. Specifying a CPU ID not present in the system or one which is currently offline induces an appropriate error message from the test.
Class of Test Methods	The Multiprocessor (MP) functionality consists of different components. A class of test method is used to specify the functionality of the MP system to be tested. Currently, the Class-of-Test methods supported by `mptest` are: E-CacheCoherency, IOCacheCoherency, SynchronizationPrimitives, and SharedMemory, and CPUXCall. This option can be used to selectively test one or more of the MP functions. If you do not specify the class of test methods, E-CacheConsistency and SynchronizationPrimitives are selected by default.
Test Tone	A test tone is a different way of executing the same test. Selecting a different test tone will exercise and test the MP functionality in a slightly different manner. The tone option can be used to select the test tone for the test. The supported test tones are: Random and Parallel mode. The "Random" test tone introduces some randomness in testing. The "ParallelTone" implies that the tests perform parallel operations (like write) on different CPUs at the same time. This tone option is optional. If you do not specify any option, then the test assumes a normal tone of testing.

TABLE 31-1 `mptest` Options *(Continued)*

`mptest` **Options**	**Description**
`mpcons` Test Tone	This option is used to select the tone for `mpconstest` cases in the `mptest`. These are options directly from the `mpconstest`. The descriptions from the `mpconstest` options are as follows:`mlockBuffer` – Lock the shared buffer in memory`AtomicMode` – Enable Atomic mode`ByteMode` – Enable Byte mode`ImmediateMode` – Enable Immediate mode`RandomMode` – Enable Random Mode`ReverseMode` – Reverse direction to decrement through memory`PrefetchMode` – Enable use of V9 prefetch instructions`Trigger` – Enable LA trigger on error`Offset` – Enable use of linesize buffer offsets This option is not mandatory. By default, the `mpcons_tone` assumes a normal mode of operation.
Number of Iterations	Same option as in `mpcontest`. This option is used to select the number of iterations for running the test loops. The range for this option is 1 to 200 and the default is 5.
Number Of Timeout Iterations	Same option as in `mpcontest`. Selects number of timeout iterations.
CPU Wait Count 0	Same option as in `mpcontest`. Forces CPU 1 to write first if number of CPUs is less than *count*.
Number of Loops	Same option as in `mpcontest`. Sets loops to specified value.
Memory Size 0—Use Default	Same option as in `mpcontest`. Specifies memory size (MB). This should always be set to the default value.
Random Mode Seed 0	Same option as in `mpcontest`. Sets random number seed to specified value.

`mptest` Test Modes

TABLE 31-2 `mptest` Supported Test Modes

Test Mode	Description
Exclusive	This test mode tests the user selected multiprocessor functionality.

`mptest` Command-Line Syntax

`/opt/SUNWvts/bin/mptest` *standard_arguments* `M=`*4+5+6+7*, `method=` ECacheCoherency+IOCacheCoherency+SynchronizationPrimitives+SharedMemory+CPU Call, `tone=`*ParallelMode+Random*, `mpcons_tone=` *mlockBuffer+AtomicMode+ByteMode+ImmediateMode+RandomMode+ReverseMode+PrefetchMode+Trigger+Offset*, `count=`*[1-200]*, `mpcons_numtmout=`*[1-10]*, `mpcons_wait=`*0*, `mpcons_loops=`*[1-999]*, mpcons_memsize=*0*, mpcons_seed=*0*

TABLE 31-3 mptest Command-Line Syntax

mptest **Options**	**Description**
M=*4+5+6+7*	This option can be used to select the CPU IDs for which to run this test. The test will use all CPUs on the system by default. Hence, this parameter is optional. The CPU IDs currently present in the system can be retrieved with the psrinfo(1M) command. Specifying a CPU ID not present in the system or one which is currently offline induces an appropriate error message from the test. Example: If you want to select CPU IDs 4, 5, 6 and 7, specify: M=*4+5+6+7*
method= *ECacheCoherency+IOCacheCoherency+SynchronizationPrimitives+SharedMemory+CPUXCall*	The Multiprocessor (MP) functionality consists of different components. A class of test method is used to specify the functionality of the MP system to be tested. Currently, the Class-of-Test methods supported by mptest are: E-CacheCoherency, IOCacheCoherency, SynchronizationPrimitives, SharedMemory, and CPUXCall. This option can be used to selectively test one or more of the MP functions. If you do not specify the class of test methods, E-CacheConsistency, SynchronizationPrimitives, and CPUXCall are selected by default.
tone=*ParallelMode+Random*	A test tone is a different way of executing the same test. Selecting a different test tone will exercise and test the MP functionality in a slightly different manner. The tone option can be used to select the test tone for the test. The supported test tones are: Random and Parallel mode. The "Random" test tone introduces some randomness in testing. The "ParallelTone" implies that the tests perform parallel operations (like write) on different CPUs at the same time. This tone option is optional. If you do not specify any option, then the test assumes a normal tone of testing.

TABLE 31-3 `mptest` Command-Line Syntax *(Continued)*

`mptest` **Options**	**Description**
`mpcons_tone=` mlockBuffer+AtomicMode+ByteMode +ImmediateMode+RandomMode+Rev erseMode+PrefetchMode+Trigger+Off set	This option is used to select the tone for `mpconstest` cases in the `mptest`. These are options directly from the `mpconstest`. The descriptions from thes `mpconstest` options are as follows: `mlockBuffer` – Lock the shared buffer in memory`AtomicMode` – Enable Atomic mode`ByteMode` – Enable Byte mode`ImmediateMode` – Enable Immediate mode`RandomMode` – Enable Random Mode `ReverseMode` – Reverse direction to decrement through memory `PrefetchMode` – Enable use of V9 prefetch instructions `Trigger` – Enable LA trigger on error `Offset` – Enable use of linesize buffer offsets This option is not mandatory. By default, the `mpcons_tone` assumes a normal mode of operation.
`count=`*[1-200]*	This option is used to select the number of iterations for running the test loops. The range for this option is 1 to 200 and the default is 5.
`mpcons_numtmout=`*[1-10]*	Same option as in `mpcontest`. Selects number of timeout iterations.
`mpcons_wait=`*0*	Same option as in `mpcontest`. Forces CPU 1 to write first if number of CPUs is less than *count*.
`mpcons_loops=`*[1-999]*	Same option as in `mpcontest`. Sets loops to specified value.
`mpcons_memsize=`*0*	Same option as in `mpcontest`. Specifies memory size (MB). This should always be set to the default value.
`mpcons_seed=`*0*	Same option as in `mpcontest`. Sets random number seed to specified value.
`dev=`*mp*	Specifies the device.

Note – 64-bit tests are located in the `sparcv9` subdirectory: `/opt/SUNWvts/bin/sparcv9/`*testname*, or the relative path to which you installed SunVTS. If a test is not present in this directory, then it might be available as a 32-bit test only. For more information, see “32-Bit and 64-Bit Tests” on page 5.

Known Problem

On Se/Si platforms with UltraSPARC IV 2.3/2.4 parts mpcons subtest (`mpcons5` and `mpcons8`) could possibly cause a fatal reset with PERR. This error has not been produced on the Enterprise Server family and Sun Fire 15K UltraSPARC III platforms.

Workaround: Deactivate `mpcons5` and `mpcons8` when performing `mptest`. The functions of `mpcons5` `mpcons8` were modified to perform as `mpcons4` and `mpcons7` respectively.

CHAPTER **32**

Sun Netra Alarm Card Test (`nalmtest`)

`nalmtest` is designed to test the alarm card on Sun Netra 240 and Sun Netra 440 servers.

Note – The Sun Netra Alarm Card Test (`nalmtest`) was previously titled Sun Netra 240 Alarm Card Test (`n240atest`) in SunVTS 5.1 PS5. The reason for this change is that this test now supports the Sun Netra 440 alarm card in addition to the Sun Netra 240 alarm card.

Caution – Solaris 8 2/02 operating system or later is required to perform the `nalmtest`.

`nalmtest` Options

To reach the dialog box below, right-click on the test name in the System Map and select Test Parameter Options. If you do not see this test in the System Map, you might need to expand the collapsed groups. Refer to the *SunVTS User's Guide* for more details.

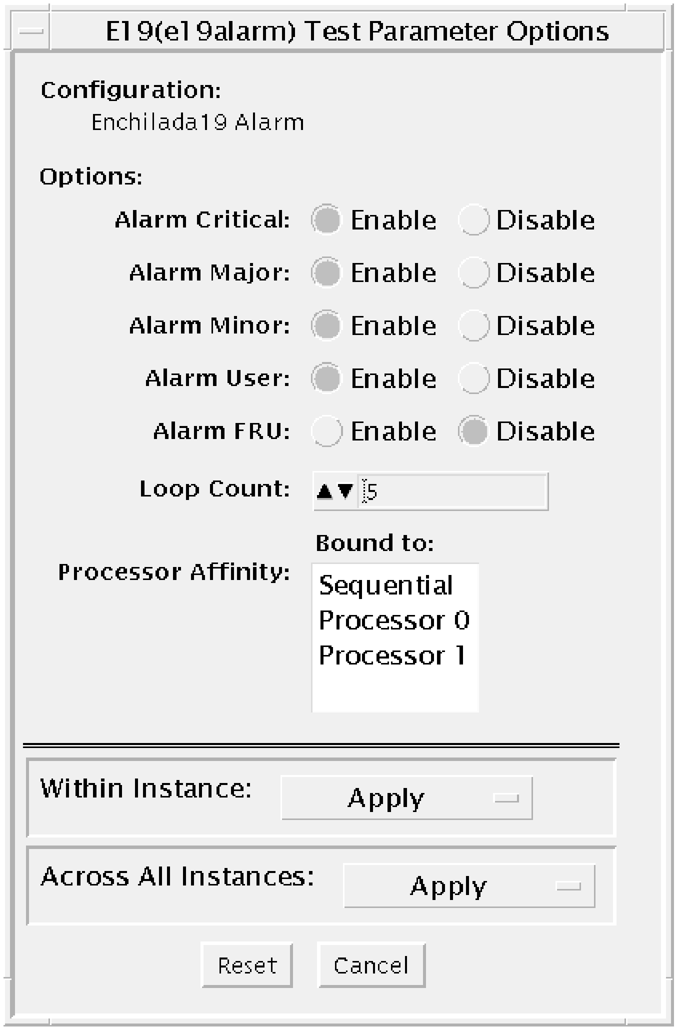


FIGURE 32-1 `nalmtest` Test Parameter Options Dialog Box

The following table describes the `nalmtest` options:

TABLE 32-1 `nalmtest` Options

`nalmtest` **Options**	**Description**
Alarm Critical	Toggles the Alarm critical LED.
Alarm Major	Toggle the Alarm critical Major.

TABLE 32-1 `nalmtest` Options *(Continued)*

`nalmtest` **Options**	**Description**
Alarm Minor	Toggles the Alarm critical Minor.
Alarm User	Toggles the Alarm critical User.
Alarm FRUID	Performs the FruID checksum test on the alarm card.
Loop Count	Sets up the loop count for toggling all four alarm LEDS. The count number is 1 to 3.

`nalmtest` Test Modes

TABLE 32-2 `nalmtest` Supported Test Modes

Test Mode	**Description**
Connection	The test determines if the devices are connected to the system you are testing and verifies that they are accessible. Device functionality is not verified; however, you can safely run connection mode tests while the system is offline.
Functional	Tests fully exercise all aspects of the device through the associated device drivers. These tests use a significant portion of the system resources and assume that the device is available for testing. For this reason, the system must be offline with no other users or application running. This mode is sometimes referred to as Offline mode.

`nalmtest` Command-Line Syntax

/opt/SUNWvts/bin/sparcv9/nalmtest *standard_arguments* **[-o**

[dev=<*device_name*> **]**
[cri=<*E(nable)*|*D(isable)*> **]**
[maj=<*E*|*D*> **]**
[min=<*E*|*D*> **]**

```
[ usr=<E|D> ]
[ fru=<E|D>]
[ count=<count_number>] ]
```

TABLE 32-3 `nalmtest` Command-Line Syntax

Argument	Description
`dev`	Specifies the name of the raw device to test.
`cri`	Toggles the Alarm critical LED.
`maj`	Toggles the Alarm critical Major.
`min`	Toggles the Alarm critical Minor.
`usr`	Toggles the Alarm critical User.
`fru`	Performs FruID checksum test on the alarm card.
`count`	Sets up the loop count for toggling all four alarm LEDS *count_number* is 1 to 3.

Note – 64-bit tests are located in the `sparcv9` subdirectory: `/opt/SUNWvts/bin/sparcv9/`*testname*, or the relative path to which you installed SunVTS. If a test is not present in this directory, then it might be available as a 32-bit test only. For more information, see "32-Bit and 64-Bit Tests" on page 5.

CHAPTER 33

Ethernet Loopback Test (`netlbtest`)

The `netlbtest` replaces the `gemtest` previously included in SunVTS. It provides functional test coverage of the devices which have device drivers that support the Ethernet loopback test. These devices include `eri` (the Ethernet device in the RIO chip) and `ge` (Gigabit Ethernet), `ce` (GigaSwift Ethernet), `dmfe` (10/100 Mbps Ethernet), and `vca` (Sun Crypto Accelerator 4000). The `netlbtest` runs in loopback (external/internal) mode.

Note – `netlbtest` does support x86 platforms on Solaris.

Note – For x86 platforms, `netlbtest` only supports network drivers that have been ported over to x86 Solaris platforms. `netlbtest` has been tested with Sun GigaSwift based cards on x86 systems.

The `netlbtest` uses DLPI RAW mode to talk to the device driver. For the purpose of this test, a packet is defined as an Ethernet header followed by the Ethernet data payload (refer to the IEEE 802.3z standard). The test generates and sends out the desired number of packets (a tunable parameter) and expects to receive the same number of packets through the loopback interface, external or internal. If an error occurs (for example, packet mismatch or timeout), an error message indicating the type of error, its probable cause(s), and recommended action(s) is displayed on the SunVTS console.

The data sent out is generated by a random number generator, and put into a data buffer. Each time a packet is sent, it is selected from a different starting point of the data buffer, so that any two consecutively transmitted packets will not be the same.

Note – Do not run `nettest` and `netlbtest` at the same time or the tests may fail.

A new debugging capability has been added in netlbtest. After one packet is not received, four more packets are transmitted. If all of them are not received within the timeout time, the test will stop with the error message, "timed out for receiving ...". If up to four packets are missing, the test will stop with an error message, "Missed %d packet(s)...". If a packet is received late and the current transmitted packet is not received, the test will stop with a warning message, "Packet delay...". If the packets arrived late but within five times the timeout value and no packet is missing, the test will pass.

netlbtest Test Requirements

You must have the Ethernet card and the device driver installed, a loopback connector in place, and Intervention mode enabled before running netlbtest. netlbtest cannot run and will not appear in the GUI if the network interface is connected to a live network; netlbtest also requires that the ethernet device be configured offline before running the test. Use the ifconfig(1M) command to bring the Ethernet device down before running netlbtest. Enter the following commands to bring the interface down:

```
# ifconfig interface down
# ifconfig interface unplumb
```

To run netlbtest, a loopback connector must be connected to the Ethernet interface. A loopback connector provides the network interface driver the necessary link for testing, while maintaining isolation from a live network. The loopback connector is required for both internal and external tests of the Ethernet device.

The loopback cable for ge and Sun GigaSwift Ethernet MMF adapter (ce fiber) is based on the following specifications: multimode, duplex, 62.5/125 micron, sc connector, 850nm. The cable can be made by splitting a standard fiber optic cable in two. The two ends of the cable should be connected to the TX and RX ports of the adapter (the order does not matter), thus forming a loop.

The loopback connector for the eri device is a standard RJ-45 connector. See Appendix A in the SunVTS User's Guide for the diagram. The loopback connector for a Sun GigaSwift Ethernet UTP adapter (ce copper) is a standard RJ-45 with all 8 pins connected. See Appendix A of the SunVTS User's Guide for the diagram.

netlbtest Options

To reach the dialog box below, right-click on the test name in the System Map and select Test Parameter Options. If you do not see this test in the System Map, you might need to expand the collapsed groups, or your system may not include the device appropriate to this test. Refer to the *SunVTS User's Guide* for more details.

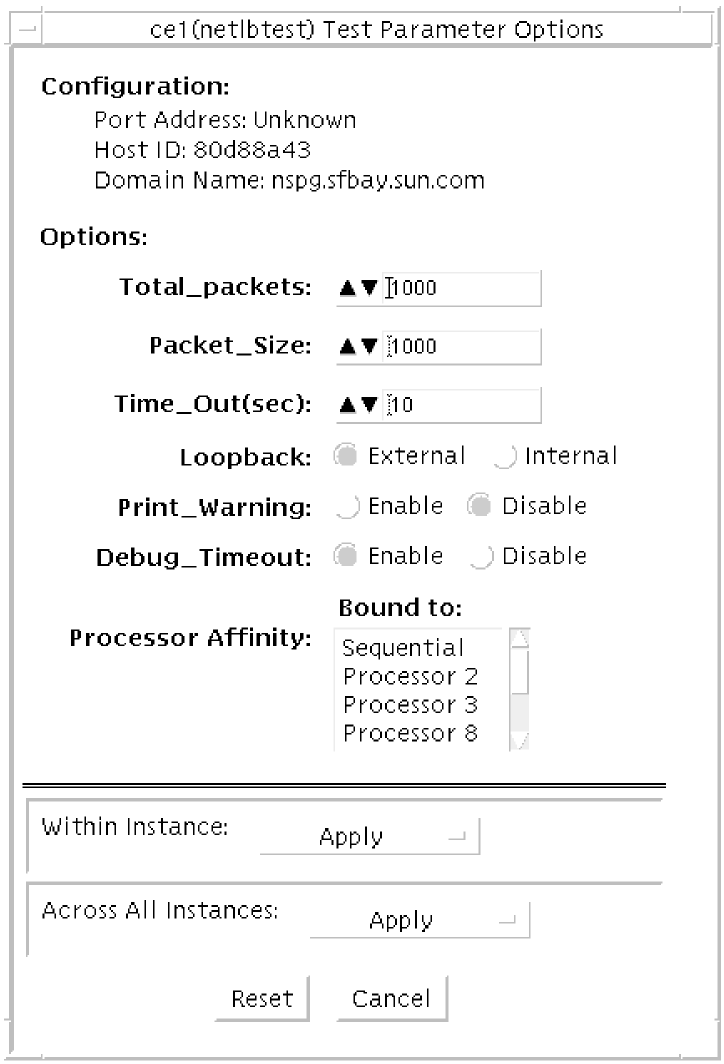


FIGURE 33-1 netlbtest Test Parameter Options Dialog Box

Refer to TABLE 33-1 for test parameter descriptions.

TABLE 33-1 `netlbtest` Options

`netlbtest` Options	Description
Configuration	Specifies the Port Address, Host ID, and Domain Name of the system under test.
Total Packets	Specifies the total number of the packets to send. The default number of packets is 1,000. The maximum number of packets is 100,000,000.
Packet size	Determines the size (in bytes) of the packets to be transmitted. 60 <= packet size <= 1514. The default packet size is 1000 bytes.
Time_Out(sec)	Determines the amount of time (in seconds) that `netlbtest` can wait to receive packets. If no packets are received within this time frame, `netlbtest` reports an error message.
Loopback	Determines the external and internal loopback mode. The default setting is internal loopback mode.
Print_Warning	Enables or disables the printing of warning messages. The default setting is Disable.
Processor Affinity	Binds the test to a specific processor. If no processor is specified, the test migrates between processors. This option is only available on multiprocessor systems.
Debug_Timeout	Enable or disable the debugging feature of `netlbtest`. The default setting is Disable.

`netlbtest` Test Modes

TABLE 33-2 `netlbtest` Supported Test Modes

Test Mode	Description
Functional (Offline)	Runs the full set of subtests. It is assumed that the host is not connected to the network through the intended test device(s).

Since `netlbtest` requires a loopback connector, it can only be selected when Intervention mode is enabled.

`netlbtest` Command-Line Syntax

`/opt/SUNWvts/bin/netlbtest` *standard_arguments*
`-o dev=`*device***`, tpkts=`***n***`, pksz=`***pkt_size***`, lb=`***Internal***`, warn=`***Disable***`,`**
`timeout=`*number_of_seconds*

TABLE 33-3 `netlbtest` Command-Line Syntax

Argument	Description
`dev=`*device_name*	Specifies the device to test such as `ge0` or `eri0`.
`tpkts=`*n*	[1...100000], count of packets to loopback. The maximum number of packets is 100,000,000.
`pksz=`*pkt_size*	[60... 1514], packet size in bytes.
`lb=`*Internal*	Selects internal (or external) loopback mode.
`warn=`*Disable*	Enables or disables printing of warning messages.
`timeout=` *number_of_seconds*	Determines the amount of time (in seconds) that `netlbtest` can wait to receive packets. If no packets are received within this time frame, `netlbtest` reports an error message. The range for timeout is from 1 to 1,000 seconds.

Note – 64-bit tests are located in the `sparcv9` subdirectory: `/opt/SUNWvts/bin/sparcv9/`*testname*, or the relative path to which you installed SunVTS. If a test is not present in this directory, then it might be available as a 32-bit test only. For more information, see "32-Bit and 64-Bit Tests" on page 5.

CHAPTER **34**

Network Hardware Test (`nettest`)

`nettest` checks all the networking hardware on the system CPU board and separate networking controllers (for example, a second SBus Ethernet controller). For this test to be meaningful, the machine under test must be attached to a network with at least one other system on the network.

Note – `nettest` does support x86 platforms that use the Solaris operating system. `nettest` supports the same set of options for both SPARC and x86 platforms. If there is a new x86 specific network interface, for which there is no entry in the `nettest.conf` file, then `nettest` will fail.

Note – This version of `nettest` is used for *all* networking devices, including Ethernet (`ie` and `le`), token ring (`tr`, `trp`), quad Ethernet (`QED`), fiber optic (`fddi`, `nf`, `bf`, `pf`), SPARCcluster™ 1 system (`em`), ATM (`sa`, `ba`), HiPPI, 100-Mbits per second Ethernet (`be,hme`), and GigaSwift Ethernet (`ce`) devices.

The `nettest` mainly uses the Internet Control Message Protocol (ICMP), and requires at least two machines on a network—the machine under test and another machine reliable enough to be a test target. Both machines must support the Transmission Control Protocol/Internet Protocol (TCP/IP) (ICMP is part of TCP/IP). The target machine must either be configured to respond to ICMP broadcast or to RPC broadcast.

First `nettest` determines the target machine(s) to test against. If no targets are specified, it sends an ICMP broadcast to find them. If it fails to find all necessary targets, it tries RPC broadcast to the RPC port mapper daemon. If you specify the targets, `nettest` uses the specified target(s) instead.

After finding the necessary targets, `nettest` performs the following tests:

- Random test—sends out 256 packets with random data length and random data.

- Incremental test—sends out packets with length from minimum to maximum packet size using incremental data. (Minimum and maximum values differ for each device.)
- Pattern test—sends 256 packets of maximum length, where each packet contains one test pattern, and all byte patterns (0 to 0xFF hex) are used. That is, the first packet contains pattern 0, the second packet contains pattern 1, and so on, until the last packet pattern of 0xFF.

Note – `nettest` is a scalable test. However, the maximum number of networked devices allowed on a system is 255, and the number of instances for each device is limited to 2. So, if you start the SunVTS exerciser using the `-i` option to specify a default number of instances for all tests, `nettest` cannot assign more than 2 instances per each networked device.

`nettest` Options

To reach the dialog box below, right-click on the test name in the System Map and select Test Parameter Options. If you do not see this test in the System Map, you might need to expand the collapsed groups, or your system may not include the device appropriate to this test. Refer to the *SunVTS User's Guide* for more details.

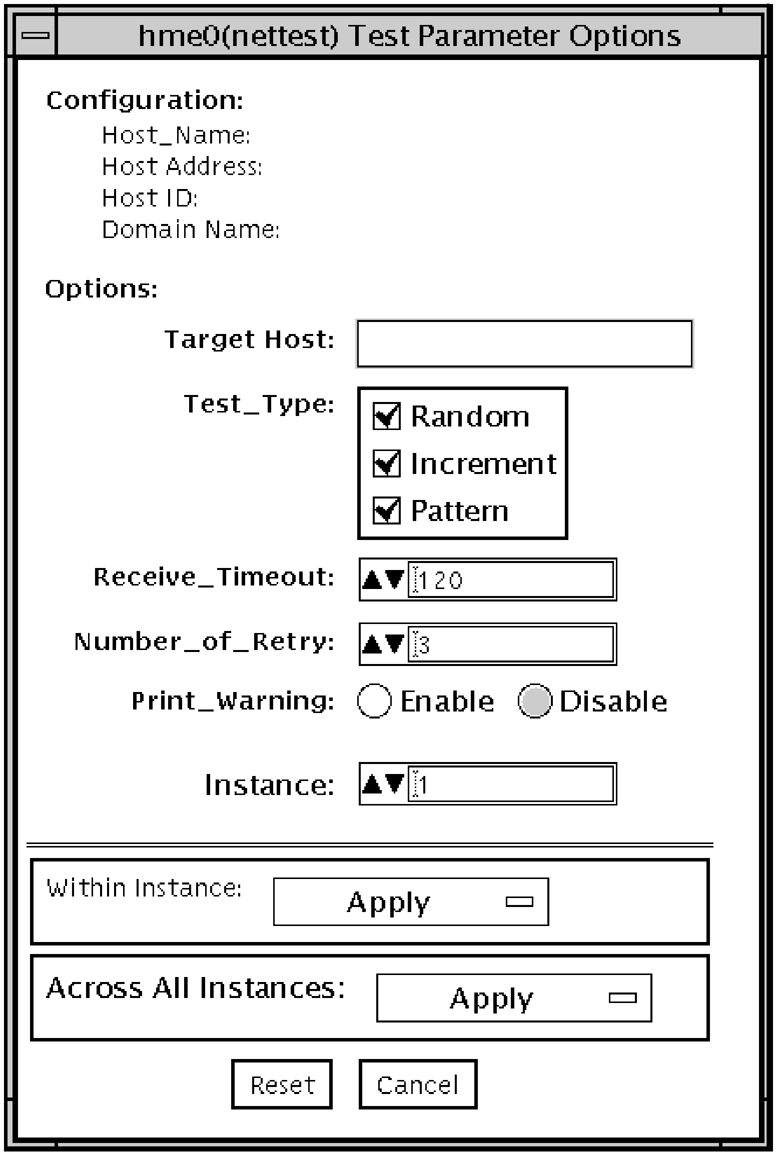


FIGURE 34-1 `nettest` Test Parameter Options Dialog Box

The Configuration section specifies the host name, host ID, host address, and domain name of the system being tested.

TABLE 34-1 `nettest` Options

`nettest` **Options**	**Description**
Target Host	Specifies one or more targets to be tested against. Target host entries can be either a host name or an Internet address. When no target host is specified, the test finds necessary targets through broadcasting. The default setting leaves this field empty.
Receive Timeout field	The default is 120 seconds, but can be changed. Use a range from 0 to 600 seconds.
Number of Retries field	The default number of retries before flagging an error is three, but can be changed. Use a range between 0 to 128 retries.
Print Warning	Disabled by default. Click Enable to see warning errors, such as retry on timeout.

`nettest` Test Modes

Both Connection and Functional test modes are supported by `nettest`. Different test schemes are performed on the network device based on the mode selected.

TABLE 34-2 `nettest` Supported Test Modes

Test Mode	**Description**
Connection	Checks whether the device is connected. It searches through all the network interfaces for a specified device name. If `nettest` does not find the device connected, the test fails; otherwise it returns: `device is connected.`
Functional (Offline)	Performs all three tests (Random test, Incremental test, and Pattern test) sequentially. It allows you to specify options that will perform heavy stress testing.
Online	Performs only the Random test.

`nettest` Command-Line Syntax

`/opt/SUNWvts/bin/nettest` *standard_arguments* **`-o target=`***h1+h2+...*, **`dev=`***interface*,**`test=`***type*,**`packets=`***n*,**`pattern=`***hex*,**`timeout=`***seconds*, **`retry=`***n*,**`warn`**

TABLE 34-3 `nettest` Command-Line Syntax

Argument	Description
`target=`*h1***`+`***h2***`+...`**	A list of test targets by host name or Internet address.
`dev=`*interface*	Network interface name. The default value is `le0` for Ethernet networks.
`test=`*type*	The test type. Type `Random`, `Increment`, or `Pattern` for the desired test. The default value is Random+Increment+Pattern where all tests run.
`packets=`*n*	Number of random/pattern packets. The default is 256.
`pattern=`*hex*	Specifies a data pattern, in hexadecimal form. The default is all patterns from `0` to `0xff`.
`timeout=`*seconds*	Indicates the number of seconds to wait before a timeout; the default is 120 seconds.
`retry=`*n*	Indicates the number of test timeout retries; the default is three retries.
`warn`	When enabled, prints warning messages.

Note – 64-bit tests are located in the `sparcv9` subdirectory: `/opt/SUNWvts/bin/sparcv9/`*testname*, or the relative path to which you installed SunVTS. If a test is not present in this directory, then it might be available as a 32-bit test only. For more information, see “32-Bit and 64-Bit Tests” on page 5.

CHAPTER **35**

Netra CT-820 IPMI Test (`nipmitest`)

The `nipmitest` exercises and verifies the basic operation of the IPMI bus and communications between the CP2300 board to the DMC (distributed management controller) board. The test sends IPMI commands and waits for a response. The test retries up to three times no response is received.

`nipmitest` Options

To reach the dialog box below, right-click on the test name in the System Map and select Test Parameter Options. If you do not see this test in the System Map, you might need to expand the collapsed groups, or your system may not include the device appropriate to this test. Refer to the *SunVTS User's Guide* for more details.

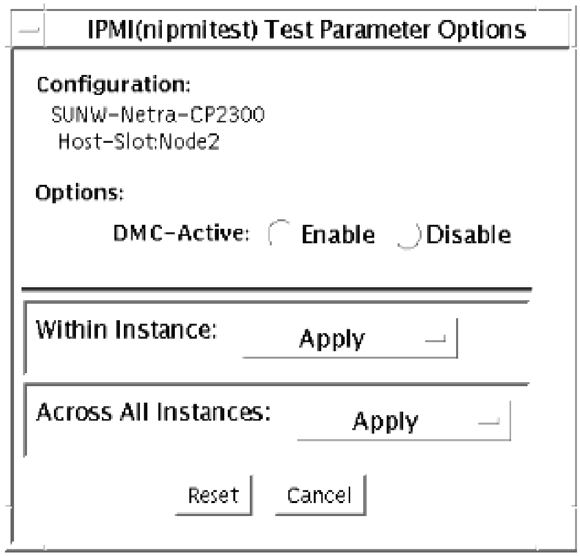


FIGURE 35-1 `nipmitest` Test Parameter Options Dialog Box

TABLE 35-1 `nipmitest` Options

`nipmitest` **Options**	**Description**
DMC Active	Enable or Disable the `nipmitest`. The default is Enable.

`nipmitest` Supported Test Modes

TABLE 35-2 `nipmitest` Supported Test Modes

Test Mode	Description
Connection	Attempts to establish communication with the DMC Active Diag Daemon Actor and reports a Pass or Fail status.
Functional	Establishes communication with the DMC Active Diag Daemon Actor, initiates all subtests that are enabled, and reports Pass or Fail status.

`nipmitest` Command-Line Syntax

/opt/SUNWvtshm/bin/nipmitest -o option=*value*, **nipmitest=**{*Enable* | *Disable*}

TABLE 35-3 `nipmitest` Command-Line Syntax

Argument	Description
nipmitest=*Enable* | *Disable*	Enable or Disable the `nipmitest`. The default is Enable.

CHAPTER 36

PCMCIA Modem Card Test (`pcsertest`)

PCMCIA is a technology that provides small, easy to use peripheral devices. PCMCIA stands for Personal Computer Memory Card International Association. It is a PC Card standard for mobile computing I/O cards. These cards range from memory, FAX/modems, serial I/O, SCSI, video, sound, and so on.

The `pcsertest` verifies the functionality of PCMCIA modem card and PCMCIA serial I/O socket card. It does not test any other PCMCIA devices.

The `pcsertest` issues a series of commands to the modem to initiate a local analog loopback test and verifies this functionality.

As an option, the `pcsertest` tests serial I/O socket cards. This test writes a pattern of incrementing data to the serial I/O socket card, which is then looped back, read and verified.

Note – When testing serial I/O socket cards, a 9-pin loopback connector is required. However, no loopback connector is required when testing the default modem card. See Appendix A for loopback connector wiring instructions.

`pcsertest` Options

To reach the dialog box below, right-click on the test name in the System Map and select Test Parameter Options. If you do not see this test in the System Map, you might need to expand the collapsed groups, or your system may not include the device appropriate to this test. Refer to the *SunVTS User's Guide* for more details.

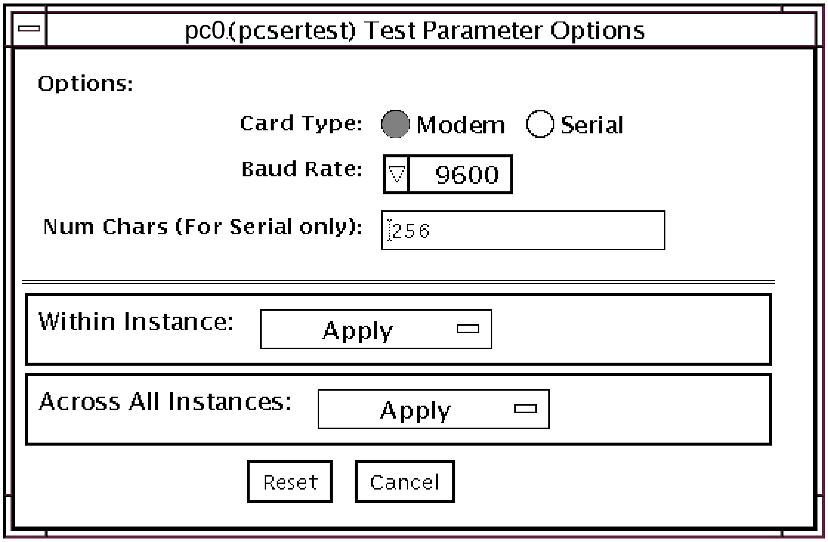


FIGURE 36-1 `pcsertest` Test Parameter Options Dialog Box

TABLE 36-1 `pcsertest` Options

`pcsertest` **Option**	**Description**
Card Type	Specifies the type of device you are testing; either a PCMCIA modem, or a PCMCIA serial I/O socket card. Note–If you choose the Serial card type, and there is no serial I/O socket card in the slot, the test fails.
Baud Rate	Specifies the baud rate for testing.
Num Chars	Specifies the number of characters being used for external loopback testing of the serial socket card. By default, this is set to 256 characters. This option is applicable only to serial socket cards and ignored for the modem card.

Note – Any combination of modem and socket I/O cards can be placed in the PCMCIA slots. However, you must select the correct type of card in the Options dialog box. If you select an incorrect card type, the test fails. The default card type for each PCMCIA slot is a modem card. If only one modem card is plugged in, the empty slot is ignored.

`pcsertest` Test Mode

TABLE 36-2 `pcsertest` Supported Test Modes

Test Mode	Description
Functional (Offline)	Runs the full set of tests.

`pcsertest` Command-Line Syntax

/opt/SUNWvts/bin/pcsertest *standard_arguments* **-o dev=***device_name***, type=***card_type***,baudrate=***speed***,numchars=***n*

TABLE 36-3 `pcsertest` Command-Line Syntax

Argument	Description
dev=*device_name*	Specifies the device name (for example, **dev=pc0** and **dev=pc1**)
type=*card_type*	Specify one of the two card types for the device (**type=serial** or **type=modem**). You do not need to specify the type if the device is a modem, since modem is the default card type.

baudrate=*speed*	Specifies the communication speed. Specify one of the following:
	`9600`
	`19200`
	`38400`
	`57600`
	The default is `9600`.

numchars=*n*	Specifies the number of characters to use for external loopback testing of the serial socket card. By default, this is set to `256` characters. This option is applicable only to serial socket cards and ignored for the modem card.

Note – 64-bit tests are located in the `sparcv9` subdirectory: `/opt/SUNWvts/bin/sparcv9/`*testname*, or the relative path to which you installed SunVTS. If a test is not present in this directory, then it might be available as a 32-bit test only. For more information, see “32-Bit and 64-Bit Tests” on page 5.

CHAPTER **37**

Sun™ XVR-100 Graphics Accelerator Test (`pfbtest`)

`pfbtest` tests the PCI-based Sun™ XVR-100 graphics accelerator by performing the following subtests:

- Video Memory test
- RAMDAC test
- Accelerator Port test

Caution – *Do not* run any other application or screen saver program that uses the Sun XVR-100 graphics accelerator port while running `pfbtest`. This program causes SunVTS to return incorrect errors.

Caution – If pfb0b is set to display, an error similar to the following occurs:
Accelerator: signature err or in test Ramdac.
Display should always be set to pfb0a when running SunVTS.

Note – Disable all screen savers before testing any graphics device. Type **`xset s off`** at a UNIX prompt to disable the Solaris screen saver. Type **`xset -dpms`** (to turn off power management) or type **`xset s noblank`** (to turn off screen saver). Disable Power Management software if it is running.

Note – To start SunVTS with `vtsui`, but without `vtsk`, you must add the host name to `xhost` as: **`xhost +`** *hostname.*

For full instructions on testing frame buffers, refer to the Testing Frame Buffers section of the *SunVTS 5.1 Test Reference Manual*.

`pfbtest` Options

To reach the dialog box below, right-click on the test name in the System Map and select Test Parameter Options. If you do not see this test in the System Map, you might need to expand the collapsed groups, or your system may not include the device appropriate to this test. Refer to the *SunVTS User's Guide* for more details.

By default, all options are enabled except frame buffer locking.

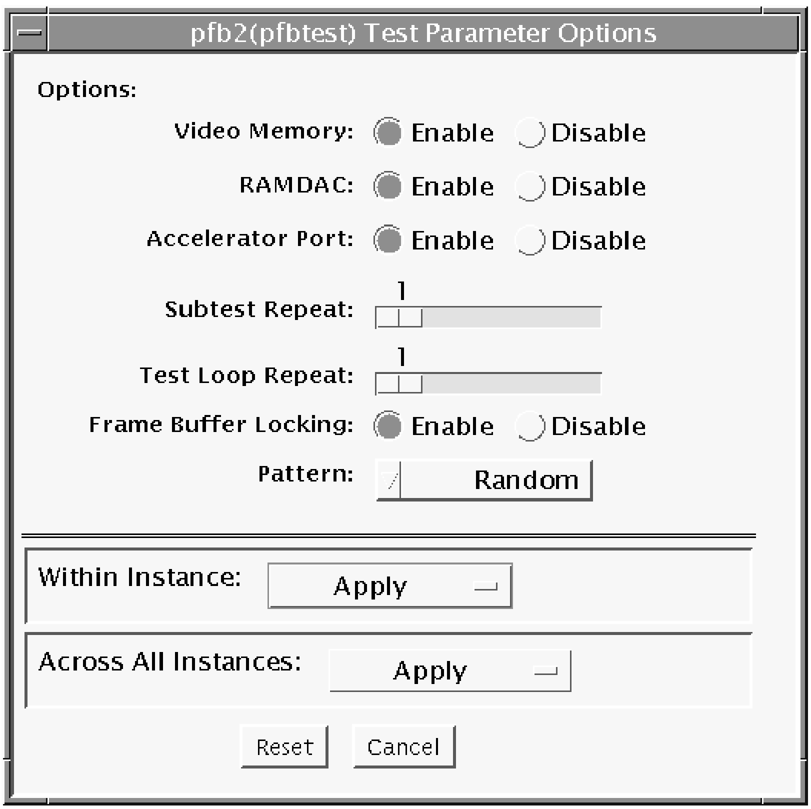


FIGURE 37-1 `pfbtest` Test Parameter Options Dialog Box

TABLE 37-1 `pfbtest` Options

`pfbtest` **Options**	**Description**
Video Memory test	Thoroughly tests the on-screen video memory (the memory part that is mapped on to the monitor) of the Sun XVR-100 graphics accelerator in 8-bit, 16-bit, 32-bit, 64-bit, and 64 byte (block) modes. Entire on-screen video memory is tested by testing 512 bit blocks at a time (8x8 pixel block). Each block is tested in two passes. Each pass consists of a data write and read. In the first pass, user specified data or random data is used, and in the second pass, one's complement of the data used in the first pass is used so that each on-screen video memory location (bit) is tested with a zero (electrical low state) and one (electrical high state).
RAMDAC test	Tests the RAMDAC in three phases. In the first phase the RAMDAC CLUT (Color LookUp Table) is tested using simple write/read patterns to determine if there are any bad bits in CLUT. The data patterns used are: • Random data • Complement of the random data (used as first data pattern) • The data pattern 0101 • The data pattern 10101 In the second phase, four different patterns are drawn on the screen. Each pattern stays on the screen for approximately 1/4 second. The four patterns are listed below. For each pattern, the signature is captured and compared with the signature obtained for the same pattern on a known good board. This test verifies that all the different data paths within the RAMDAC are functioning properly. Patterns drawn on screen: • Red ramp with cursor at top-left corner of the screen • Blue ramp with cursor at top-right corner of the screen • Green ramp with cursor at bottom-left of the screen • Grey ramp with cursor at bottom-right of the screen In the last (third) phase of the RAMDAC test the Vertical Retrace Interrupt is tested for approximately five seconds.
Accelerator Port test	Tests all of the following: • Data paths (sources: fixed color, host data, blit, fixed pattern) • Arithmetic and logic unit (ALU) • Primitives (destinations: line, rectangle) • Mono to color expansion logic Primitives are drawn using a combination of different data paths (allowed), ALU functions, and color comparator functions. A checksum is generated for each data combination and is compared with the checksum generated for the same data combination on a known good board.

TABLE 37-1 `pfbtest` Options *(Continued)*

`pfbtest` Options	Description
Frame Buffer Locking	This option is set to *disable* if the Sun XVR-100 graphics accelerator is not the console device. When the SunVTS GUI is brought up, Frame Buffer Locking is enabled by default if the Sun XVR-100 graphics accelerator is the console device. If the Sun XVR-100 graphics accelerator is not the console device, Frame Buffer Locking is disabled by default.

`pfbtest` Test Modes

Due to the nature of graphics tests, reading from or writing to the frame buffer during graphics tests will disturb user operation. This test is only available in the Functional test mode.

TABLE 37-2 `pfbtest` Supported Test Modes

Test Mode	Description
Functional	The `pfbtest` verifies the proper functioning of Sun XVR-100 graphics accelerator.

`pfbtest` Command-Line Syntax

`/opt/SUNWvts/bin/pfbtest` *standard_arguments* **`-o dev=`***device_name***`, S=`** *subtest_number,***`F=`***#_of_subtest_loops,***`B=`***#_of_test_loops***`,L=`***disable***`,P=`***test_pattern*

TABLE 37-3 `pfbtest` Command-Line Syntax

Argument	Description
dev=*device_name*	*device_name* is the relative path name of the device being tested with respect to /dev/fbs. The default is pfb0.
S=*subtest_number*	*subtest_number* is the test number of the subtest to be run. Select from the subtests below. You can run multiple subtests by adding the subtest numbers. For example, `n=0x3` runs both test 1 and test 2; `n=0x5` runs both test 1 and test 4. • `n 0x1 VRAM` • `n 0x2 RAMDAC` • `n 0x4 Accelerator port test (Rendering Pipeline)` More than one test can be selected by ORing subtest numbers. For example: n = 0x5 indicates VRAM and Rendering Pipeline tests. A hex number must be preceded by 0x, decimal numbers are also acceptable.
F=*#_of_subtest_loops*	Specifies the number of times to repeat each subtest. The default is 1.
B=*#_of_test_loops*	Specifies the number of times to repeat a test loop before passing; the default is 1.
L=*disable*	Disables the frame buffer lock. Disable the lock when the Sun XVR-100 graphics accelerator is not the console or when the server is not running on the Sun XVR-100 graphics accelerator under test.
P=*test_pattern*	Specifies the test pattern number. The default is `r`, for random patterns. You may also choose `0` for 0x0000000, `3` for 0x3333333, `5` for 0x5555555, or `9` for 0x9999999.

Note – 64-bit tests are located in the `sparcv9` subdirectory: `/opt/SUNWvts/bin/sparcv9/`*testname*, or the relative path to which you installed SunVTS. If a test is not present in this directory, then it might be available as a 32-bit test only. For more information, see “32-Bit and 64-Bit Tests” on page 5.

Note – Errors returned by `pfbtest` are nonspecific. It is not possible to determine which component caused a failure. In all error conditions, the field replaceable unit (FRU) is the entire Sun XVR-100 graphics accelerator.

CHAPTER **38**

Physical Memory Test (`pmemtest`)

The `pmemtest` checks the physical memory of the system and reports hard and soft error correction code (ECC) errors, memory read errors, and addressing problems. The pseudo driver `mem` is used to read the physical memory.

Note – `pmemtest` supports the same set of options for both SPARC and x86 platforms.

This test reads through all the available physical memory. It does not write to any physical memory location.

`pmemtest` Options

`pmemtest` is supported both in physical mapping and logical mapping displays in the UI. In physical mapping, `pmemtest` provides support to test the memory on a per-board basis; users can select the `pmemtest` which is displayed under the physical memory board, which is to be tested and test only that board. In logical mapping, the `pmemtest` options apply to the complete memory across the boards.

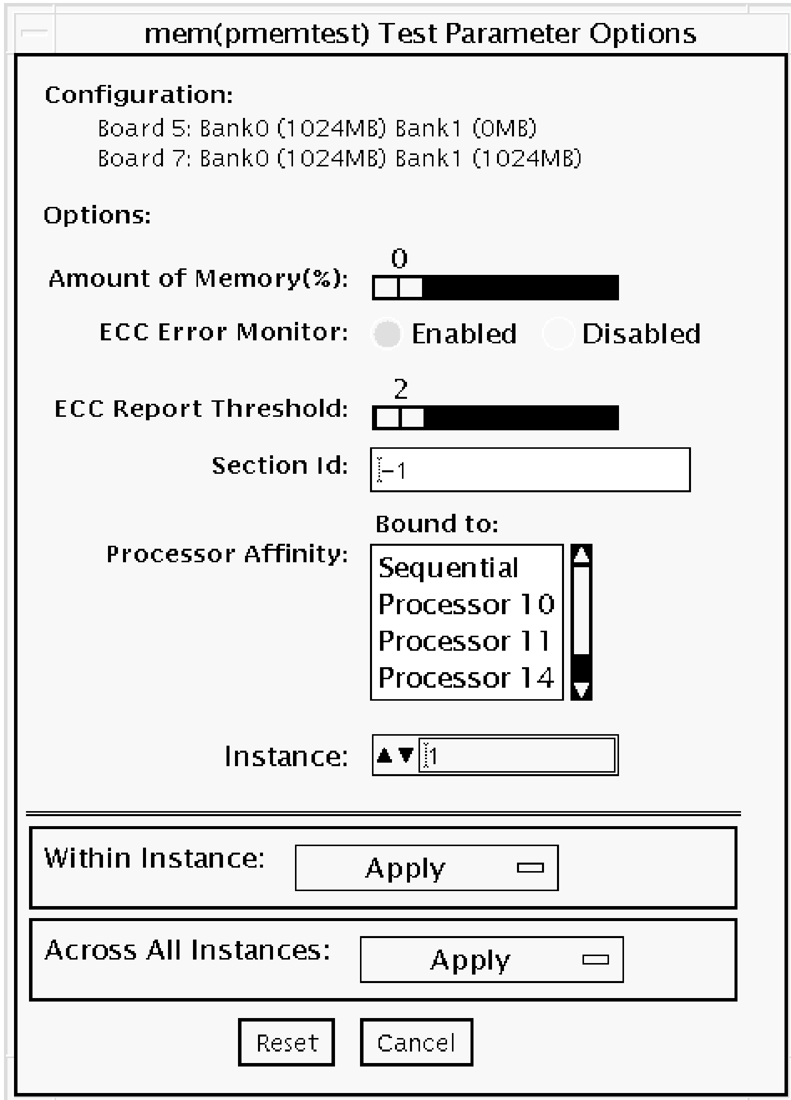


FIGURE 38-1 `pmemtest` Test Parameter Options Dialog Box

TABLE 38-1 `pmemtest` Options

`pmemtest` **Options**	**Description**
Configuration	Shows the total amount of physical memory, rounded up to the nearest megabyte, probed by the SunVTS kernel.
Amount of Memory	Specifies the percentage of the physical memory to be tested. The default 0% ensures dividing the total memory equally among instances which results in 100% coverage at the completion of every test pass. Note that one test pass includes one pass each by all instances.
ECC Error Monitor	This option is used to enable or disable ECC error monitoring.
ECC Report Threshold	Determines how many correctable ECC errors occurred in the elapsed time before pmemtest reports a test failure. A value of zero results in no report of any correctable ECC errors. The default is 2. This option is only available on UltraSPARC systems.
Section ID	When set to -1, pmemtest will test one memory section in each pass, automatically testing each subsequent memory section as testing progresses. When set to a number other than -1, only the section specified will be tested. A section is defined by the pass and instance number settings. This option is only available on UltraSPARC systems.
Instance	Instances are the number of copies of pmemtest to run simultaneously on the memory being tested.

Note – The amount of memory option is specified on a “per instance” basis. The real memory coverage for one test pass depends on the amount of memory option and the number of instances. For example, if there are four instances, and each instance specifies “50%” for the amount of memory option, then this will result in “200%” (4 times 50%) coverage on each test pass. For guaranteed 100% memory coverage for each test pass, choose default percentage size option as 0% for all instances.

`pmemtest` Test Modes

TABLE 38-2 `pmemtest` Supported Test Modes

Test Mode	Description
Connection Test	In this mode, one percent of the memory is read. `pmemtest` also informs the user how much physical memory is available. For sun4m, sun4u, and UltraSPARC servers, the test reports the ECC errors that have occurred since it was last invoked. The test reports ECC errors for a particular CPU or memory board when physical mapping is selected, otherwise it provides the SIMM number of the ECC memory error.
Functional (Offline)	In Functional test mode, the amount of memory to be read can vary. By default 100% of the memory is tested. Also for UltraSPARC servers, this test mode reports the ECC errors that have occurred since it was last invoked. The test reports ECC errors for a particular memory board when physical mapping is selected, otherwise it provides the SIMM number of the ECC memory error.
Online	In this mode too, the amount of memory to be read can vary. By default 100% of the memory is tested. Also for UltraSPARC servers, this test mode reports the ECC errors that have occurred since it was last invoked. The test reports ECC errors for a particular memory board when physical mapping is selected, otherwise it provides the SIMM number of the ECC memory error.

`pmemtest` Command-Line Syntax

For 32-bit configurations:

/opt/SUNWvts/bin/pmemtest *standard_arguments* **-o size=[0-100], dev=***device_name*, **eccmon=***Enabled*|*Disabled*, **threshold=***report_threshold*, **bdinfo=***number*, **section=***section_id*

For 64-bit configurations:

/opt/SUNWvts/bin/sparcv9/pmemtest *standard_arguments* **-o size=[0-100], dev=***device_name*, **eccmon=***Enabled*|*Disabled*, **threshold=***report_threshold*, **bdinfo=***number*, **section=***section_id*

TABLE 38-3 `pmemtest` Command-Line Syntax

Argument	Description
`size=[0-100]`	Specifies the percentage of memory to be tested. The default is 0% (for 100% memory coverage).
`dev=`*device_name*	Specifies the device to test, for example, `mem`.
eccmon= Enabled | Disabled	ECC error monitoring is enabled or disabled.
`threshold=` *report_threshold*	Determines how many correctable ECC errors occur before they are reported as an error causing `pmemtest` to report a failure. A value of zero results in no report of any correctable ECC errors. The default is 2. This option is only available on UltraSPARC systems.
`bdinfo=`*number*	For UltraSPARC servers, this argument indicates board number information. For example, if board 0 and board 5 have memory and you want the test to read the memory on both boards, then this argument should read `bdinfo`=33 (2**5+2**0). The `bdinfo` value can be specified as 0 to test the memory present on all boards.
`section=`*section_id*	When set to `-1`, `pmemtest` will test one memory section in each pass, automatically testing each subsequent memory section as testing progresses. When set to a number other than `-1`, only the section specified will be tested. A section is defined by the pass and instance number settings. This option is only available on UltraSPARC systems.

Note – 64-bit tests are located in the `sparcv9` subdirectory: `/opt/SUNWvts/bin/sparcv9/`*testname*, or the relative path to which you installed SunVTS. If a test is not present in this directory, then it might be available as a 32-bit test only. For more information, see “32-Bit and 64-Bit Tests” on page 5.

CHAPTER **39**

Parallel Port Printer Test (`pptest`)

The `pptest` exercises the parallel port devices. The test supports Sbus parallel port and IEEE 1286 complaint parallel port.

The parallel port device is an exclusive use device. Only one application can interface with it at a time.

This test is not scalable.

Hardware and Software Requirements

The SBus printer card or IEEE 1284 compliant parallel port device and device drivers must be installed to run pptest. To run the optional printer subtest, a printer must be attached to the printer port, and be powered-up.

To run the optional external loopback test on IEEE 1284 compliant parallel port device, a passive loopback connector must be installed on the printer port.

Note – The external loopback test for IEEE 1284 compliant parallel port device is intended for Sun internal manufacturing use only. It requires a custom loopback connector not available to an external customer.

Large PostScript files or raster files may require that the printer has 2 MB or more of memory. Otherwise, the printout may appear on two different sheets of paper

`pptest` Subtests

pptest supports the following subtests.

TABLE 39-1

Subtest	Description
Internal Test FIFO Loopback	Verifies DMA and PIO accesses to the ecpp device. It uses an Internal Test FIFO on the ecpp device. There are no printer or loopback connectors required. This test is always executed on an IEEE 1284 compatible printer device.
External Passive Loopback	This verifies the parallel port I/O connections to the back panel connector. This test requires a passive loopback connector (Sun part no. 270-2965-01). This test is disabled by default and must be manually enabled by the user. The test is supported only on an IEEE 1284 compatible printer device. Note: The external loopback test is intended for Sun internal manufacturing use only. It requires a custom loopback connector that is not available to an external customer.
Printer test	This verifies the parallel port printer operation. It outputs a half page of data. The user must verify that data printed properly. This test is disabled by default and must be manually enabled by the user.

`pptest` Options

To reach the dialog box below, right-click on the test name in the System Map and select Test Parameter Options. If you do not see this test in the System Map, you might need to expand the collapsed groups, or your system may not include the device appropriate to this test. Refer to the *SunVTS User's Guide* for more details.

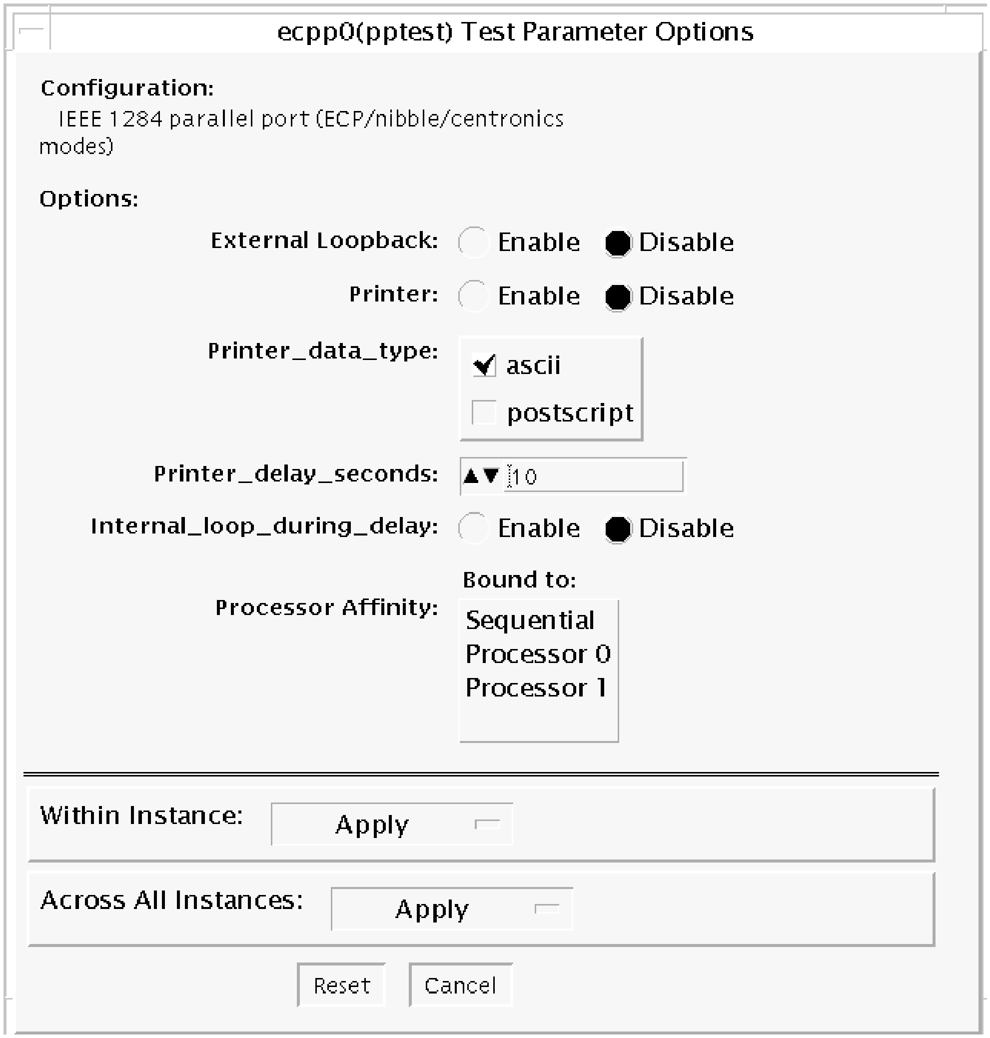


FIGURE 39-1 `pptest` Test Parameter Options Dialog Box

TABLE 39-2 `pptest` Options

Options	Description
External Loopback	Enables or disables the external loopback test. This test requires a special loopback plug. This option is available only for IEEE 1284 parallel port printer.
Printer	Enables or disables the printer test; this test requires a printer to be attached to the parallel port.
Printer_data_type	Choose whether ASCII text or PostScript data is sent to the printer. The printer test must be enabled for this to be meaningful. A postscript printer must be attached to print postscript data. This option is available only for IEEE 1284 compatible parallel printer.
Printer_delay_seconds	Allows the user to choose a delay between passes of the printer test. This prevents continuous printing of data that could quickly empty the paper supply. This is only meaningful if the printer test is enabled. This option is available only for IEEE 1284 compatible parallel printer.
Interrnal_loop_during_delay	Enables the Internal Test FIFO loopback test during the printer delay time. This is only meaningful if the printer test is enabled. This option is available only for IEEE 1284 compatible parallel printer.
Mode	Sets the print intervals. This option lets you select the intervals at which the test image is printed. The choices are: • fast–prints an image every 10 seconds. • medium–prints an image every 12 minutes. • extended–prints an image every 30 minutes.

pptest Test Modes

pptest test supports Connection and Functional test modes.

TABLE 39-3 Supported Test Modes

Test Mode	Description
Connection	Opens and closes the parallel port device. No data is transferred. The test passes if the device can be open and closed successfully. The test also passes if the device cannot be opened because the device is busy with another process.
Functional	The testing done in this mode registers a failure if the port is found busy. This is because SunVTS tests make the assumption that all the resources will be available for testing in the Functional test and therefore the unavailability of the device is interpreted as an indication of a fault condition. On ecpp(7D) devices the test runs the internal loopback test and the test can optionally run the external loopback test or the printer test.

pptest Command Line Syntax

/opt/SUNWvts/bin/sparcv9/pptest *standard_arguments* -o dev=*dev-name*, ext_loop=*Enable*|*Disable*, printer=*Enable*|*Disable*, data=*ascii*, postscript, delay=*0-86400*, dloop=*Enable*|*Disable*, mode=*fast*|*medium*|*extended*

TABLE 39-4 pptest Command Line Syntax

Argument	Description
dev=*dev-name*	This is the target device name. The test runs on the specified device name. For Ex. dev=*ecpp0* will execute the test on /dev/ecpp0 device.
ext_loop=*Enable*|*Disable*	This option is available only for IEEE 1284 complaint parallel port device. If enabled, the external loopback test is run. The external loopback plug must be attached to the printer port.
printer=*Enable*|*Disable*	The option is available only for IEEE 1284 complaint parallel port device. If enabled, the printer test is run. A parallel port printer must be attached.

TABLE 39-4 `pptest` Command Line Syntax *(Continued)*

Argument	Description
`data`=*ascii,postscript*	This option is available only for IEEE 1284 complaint parallel port device. Choose whether ASCII text or PostScript data is sent to the printer. A PostScript printer must be attached to print postscript data.
`delay`=*0-86400*	This option is available only for IEEE 1284 complaint parallel port device. Allows the user to choose a delay between passes of the printer test. This prevents continuous printing of data that could quickly empty the paper supply.
`dloop`=*Enable|Disable*	This option is available only for IEEE 1284 complaint parallel port device. If enabled, the printer internal loopback test is run during the print delay duration.
`mode`=*fast|medium|extended*	The option is available only for non IEEE 1284 complaint parallel port device. Sets the test image print rate. Possible rates are as follows: • fast–The option prints an image every 10 seconds. • medium–The option prints an image every 12 minutes. • extended–The option prints an image every 30 minutes.

CHAPTER **40**

Qlogic 2202 Board Test (`qlctest`)

`qlctest` is made up of several subtests that test the functions of the Qlogic 2202 FC/AL Crystal. Unlike the earlier single-port Q2100 board, the Q2202 is a two-port board which has greater diagnostic support.

This test is not scalable.

Note – Do not run customer data while running `qlctest`, as the test will take priority over customer data requests. The customer will be unable to access data while `qlctest` is running.

Note – Do not run other tests while `qlctest` is running. `qlctest` may cause other tests to fail.

Note – `qlctest` is an intervention mode test. No subtests can be selected unless intervention is set.

`qlctest` Subtests

There are nine possible subtests to run in intervention and functional modes:

- Fcode revision check
- Firmware revision check
- Board revision check
- Checksum Firmware subtest
- Selftest
- Mailbox Loopback subtest

- Internal 10-bit Loopback subtest
- Internal 1-bit Loopback subtest
- External Loopback subtest

The external loopback test is an intervention test. To test the fibre loop, leave the QLC port attached to the storage. In the Test Parameters Options dialog box, set the "Test if Connected to Storage" option to "Yes". To test the Qlogic 2202 board alone, connect a loopback cable to the QLC port. This cable can be made by taking a regular cable and splitting it apart. Then loop the transmitter side of the port to the receiver side of the port.

For subtest descriptions, see TABLE 40-1.

`qlctest` Options

To reach the dialog box below, right-click on the test name in the System Map and select Test Parameter Options. If you do not see this test in the System Map, you might need to expand the collapsed groups, or your system may not include the device appropriate to this test. Refer to the *SunVTS User's Guide* for more details.

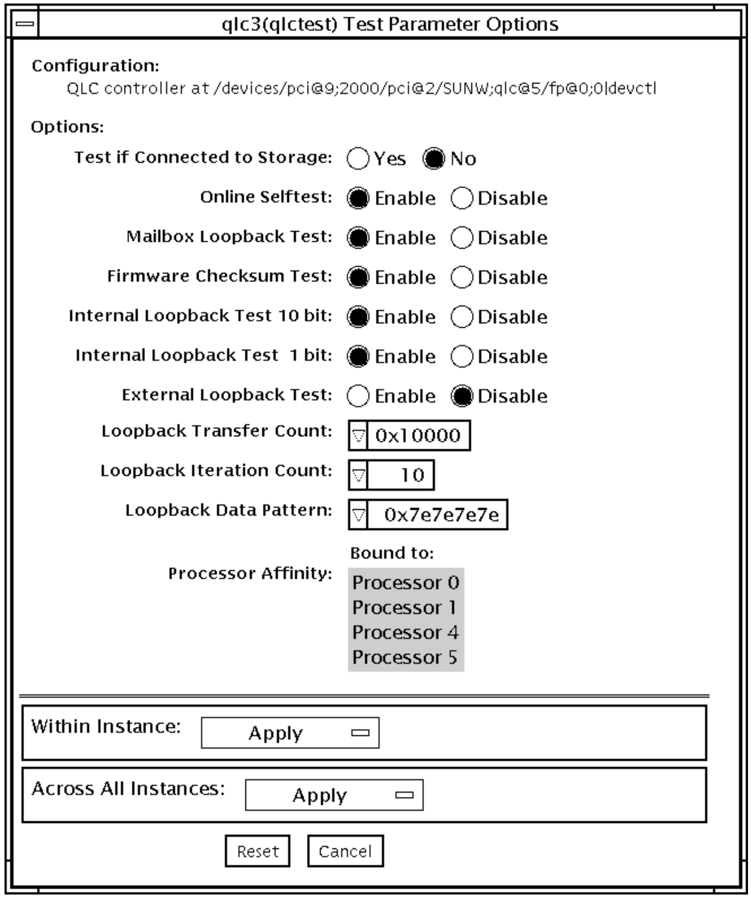


FIGURE 40-1 `qlctest` Test Parameter Options Dialog Box

TABLE 40-1 `qlctest` Options

`qlctest` **Options**	**Description**
Fcode revision check	Retrieves the fcode revision string. A core subtest that is always run but not shown in the Options dialog box.
Firmware revision check	Retrieves the firmware revision string. A core subtest that is always run but not shown in the Options dialog box.
Board revision check	Retrieves the board revision levels. A core subtest that is always run but not shown in the Options dialog box.
Test if Connected to Storage	Runs `qlctest` while connected to storage. Default value is No.

TABLE 40-1 `qlctest` Options

`qlctest` **Options**	**Description**
Selftest	Evaluates the functionality of ISP hardware by performing the following tests: • Transmit FIFO test • Receive FIFO test • SRAM test • Misc. Register tests Run by default, but can be deselected.
Mailbox Loopback subtest	Loads a series of registers into the input mailboxes on the card and then reads the output mailboxes and compares results. This verifies that the system side of the card is operating correctly, and that the internal data paths are correct. Run by default, but can be deselected.
Firmware Checksum subtest	Runs an internal checksum test on the installed firmware. This verifies that the RISC RAM on the card is fully functional and that the installed firmware is still intact. This test also serves as a quick RAM check of the RISC RAM. Run by default, but can be deselected.
Internal 10-bit Loopback subtest	Performs internal loopback test within the host adapter ISP hardware at the 10-bit interface. This test is done with data sourcing from the system memory and going to the system memory. The desired data pattern, transfer length, and iteration count can be selected via the test parameters menu. Run by default, but can be deselected.
Internal 1-bit Loopback subtest	Performs internal loopback test within the host adapter ISP hardware at the 1-bit interface. This test is done with data sourcing from the system memory and going to the system memory. The desired data pattern, transfer length, and iteration count can be selected via the test parameters menu. Run by default, but can be deselected.
External Loopback subtest	Performs an external loopback test. This test is done with data sourcing from the system memory and going to the system memory. The desired data pattern, transfer length, and iteration count can be selected via the test parameters menu. This is an intervention test, because a loopback cable is needed from the transceiver to the receiver of the QLC port when testing this port by itself. This subtest can also test the entire fibre channel loop when the loop is connected to the storage to be tested. Not run by default, but can be selected.

TABLE 40-1 `qlctest` Options

`qlctest` **Options**	**Description**
Loopback Transfer Count	Controls the packet size used in the internal 10-bit, internal 1-bit, and external loopback tests. Default value is `0x10000`.
Loopback Iteration Count	Sets the number of times to loop the internal 10-bit, internal 1-bit, and external loopback tests. Default value is `10`.
Loopback Data Pattern	Selects the data pattern to loop for the internal 10-bit, internal 1-bit, and external loopback tests. Default value is `0x7e7e7e7e`.

`qlctest` Test Modes

TABLE 40-2 `qlctest` Supported Test Modes

Test Mode	**Description**
Connection	Opens and closes the QLC port.
Exclusive	Supported

`qlctest` Command-Line Syntax

/opt/SUNWvts/bin/qlctest *standard_arguments*
-v -o dev=*device name*,**run_connect=***Yes|No*,**selftest=***Enable|Disable*,
mbox=*Enable|Disable*,**checksum=***Enable|Disable*,**ilb_10=***Enable|Disable*, **ilb=**
Enable|Disable,**elb=***Enable|Disable*,**xcnt=***0xtransfer_count*, **icnt=***iteration_count*,
lbfpattern=*0xpattern*

TABLE 40-3 `qlctest` Command-Line Syntax

Argument	**Description**
dev	The name of the device to test.
run_connect=*Yes|No*	If **run_connect** is set to Yes, `qlctest` will run when the tested port is connected to storage. If the port being tested is not connected to storage, this option has no effect. Default value is No.
selftest= *Enable|Disable*	Enables or disables the selftest command. Evaluates the functionality of the ISP hardware. Enabled by default.

TABLE 40-3 `qlctest` Command-Line Syntax

Argument	Description
`mbox=`*Enable|Disable*	Enables or disables the mailbox loopback command. This test writes data patterns into the mailboxes and then reads them back from the output mailboxes and verifies the data is correct. Enabled by default.
`checksum=` *Enable|Disable*	Enables or disables the checksum command. Runs an internal checksum test on the installed firmware. This verifies that the RISC RAM on the card is fully functional and that the installed firmware is still intact. This test also serves as a quick RAM check of the RISC RAM. Enabled by default.
`ilb_10=`*Enable|Disable*	Enables or disables the internal 10-bit test. Performs internal loopback test within the host adapter ISP hardware at the 10-bit interface. Enabled by default.
`ilb=`*Enable|Disable*	Enables or disables the internal 1-bit test. Performs internal loopback test within the host adapter ISP hardware at the 1-bit interface. Enabled by default.
`elb=`*Enable|Disable*	Enables or disables the external loopback test. The desired data pattern, transfer length, and iteration count can be selected via the test parameters menu. Requires a cable for this intervention test. Disabled by default.
`xcnt=`*0xtransfer_count*	Controls the packet size to be transferred, for example, 0x1000. Default value is 0x10000.
`icnt=`*iteration_count*	Controls the number of times the loopback test will run, for example, 100. Default value is 10.
`lbfpattern=`*0xpattern*	Lists the data pattern to loop, for example, 0x7E7E7E7E. Default value is 0x7E7E7E7E.

Note – 64-bit tests are located in the `sparcv9` subdirectory: `/opt/SUNWvts/bin/sparcv9/`*testname*, or the relative path to which you installed SunVTS. If a test is not present in this directory, then it might be available as a 32-bit test only. For more information, see “32-Bit and 64-Bit Tests” on page 5.

CHAPTER **41**

RAM Test (`ramtest`)

`ramtest` is designed to stress the memory modules (RAM) instead of the whole memory subsystem. The test is optimized to achieve large memory bandwidth on UltraSPARC III (USIII) and UltraSPARC II (USII) class of CPUs. `ramtest` has an integrated ECC error monitor which reports the ECC errors found during the test run.

This test is being added only for the Exclusive mode testing because of the high stress it puts on the memory and the system interconnect. `ramtest` assumes that no other application is running at the same time.

Caution – This is an Exclusive mode test. No other application should be running during this test.

`ramtest` Options

To reach the dialog box below, right-click on the test name in the System Map and select Test Parameter Options. If you do not see this test in the System Map, you might need to expand the collapsed groups. Refer to the *SunVTS User's Guide* for more details.

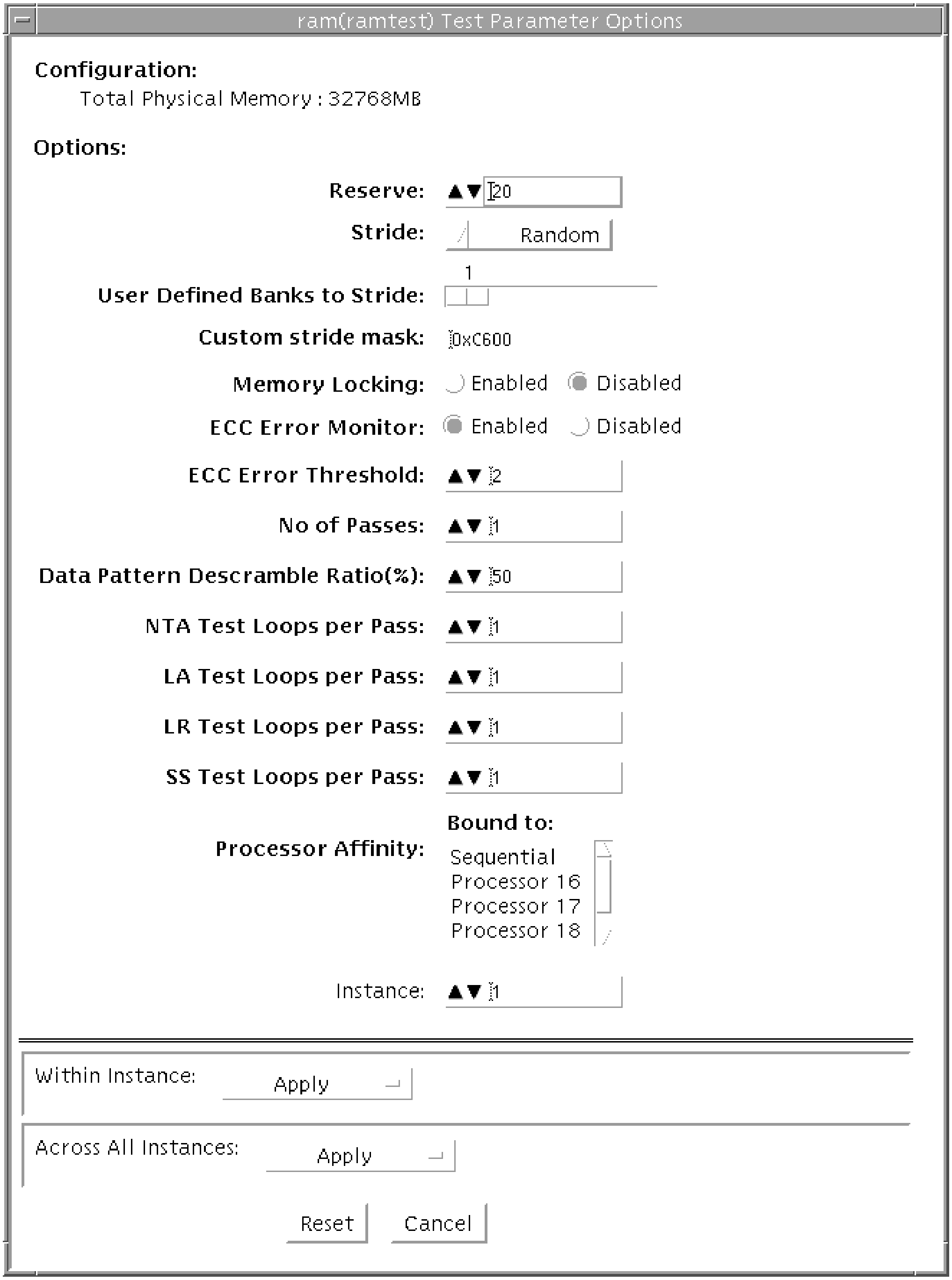


FIGURE 41-1 `ramtest` Test Parameter Options Dialog Box

The following table details the `ramtest` options:

TABLE 41-1 `ramtest` Options

`ramtest` **Options**	**Description**
Reserve	Reserve option represents the percentage of physical memory that is assumed to be in use by the OS or other processes. If you see excessive swapping while running ramtest, increase this percentage. The default is 20%; this means that ramtest allocates 80% of physical memory size for testing. Swapping decreases stress on memory and increases it on the system itself. For memory testing purposes, it is recommended to minimize swapping by tuning the reserve option. If for some reason the allocation or locking (in case Memory Locking is enabled) does not succeed, the amount of memory is reduced and the allocation process is repeated. Once the allocation succeeds, the amount of memory allocated is displayed in the messages.
Stride	By default this option is set to "Random". It can be set to "Column" or "Row" also. In case of random, either Row or Column are randomly selected for each pass. Value of stride defines the memory locations addressed consecutively in certain subtests, in a hardware dependent manner. All testable memory is still tested. Using different strides, checks coupling among different sets of memory cells; therefore random is the recommended value for this option unless both Column and Row are being explicitly used in different instances. For FA type of uses, stride may also be set to "UserDefined", in this case the test will stride the number of banks specified in the "userstride" option. Stride may be set to "Custom" in which case the stride values are randomly selected from the strides specified in the "stridemask" value. Stride may be set to “Custom” in which case the stride values are randomly selected from the strides specified in the “stridemask” value.
User-Defined Banks to Stride	Use this option to set the number of banks that the test should stride. One recommended choice is the interleave on the suspect bank, during FA. The value is currently limited to between 1 and 16. (This also means row striding is not possible while using this option).

TABLE 41-1 `ramtest` Options *(Continued)*

`ramtest` **Options**	**Description**
Stridemask	When stride=custom is selected, this value specifies the strides used. Each thread selects one of the stride values from stridemask by selecting one of the bits in the mask. The bits in the stridemask value represent the Least Significant Bit of the stride. Thus a value of 0x4000 calls for a stride of 16384 (using Bit 14 of the address). Mulitple bits can be set mixing row and column strides. Consult the Memory Controller section of the PRM for the CPU of the test system to discover how the memory reference address is divided between rows and columns in the DRAM. The value can be specified as a Decimal (NNN), Hexadecimal (0xNNN), or Octal (0NNN) value. The maximum value is 0x400000 (4194304). The default value is 0xC600 which represents strides using Bits 15, 14, 10, and 9.
Memory Locking	By default memory locking is "Disabled". To turn it on, set lock to "Enabled". This test uses ISM to lock the memory into the core, this gives 4 MB virtual pages and avoids swapping. Running without locking on the other hand, adds more randomness to the addressing sequence.
ECC Error Monitor	ECC Monitor is "Enabled" by default. The ECC error monitor runs as a separate thread in the test. When an ECC error is detected, the message is displayed on to the test output. The monitor can be turned off by setting this option to "Disabled".
ECC Error Threshold	This is the number of ECC errors after which the test will stop (if ECC monitor is running). When the threshold is reached, the test will exit with a non zero exit code. If set to zero, the test will still report all the errors but will not stop. The default of threshold is 2.
Number of Passes	This option specifies the number of passes, in the same instance. Increasing passes is recommended in case "lock" is enabled, this will save time spent on locking the memory every time a new process/instance is spawned by the VTS kernel. Note that this pass has no relation with the system passes in the VTS infrastructure, it will appear that `ramtest` is taking longer to complete system passes.
NTA March Test	Specifies number of loops of NTA march(30N) test, per pass. Increasing the number of loops of any subtest increases the relative time spent on that subtest in each pass. This increase also increases the time taken to complete a pass. NTA march test attacks coupling and stuck at faults. NTA march is efficient at finding single, double, and some triple bit errors. Depending on the stride option, coupling faults between cells in adjacent columns, or rows that are targeted. Note that test time will be higher when row striding is selected because of greater page faults generated. For efficiency purposes, total memory is divided among available CPUs.

TABLE 41-1 `ramtest` Options *(Continued)*

`ramtest` **Options**	**Description**
LA March Test	Specifies number of loops of LA march(22N) test, per pass. Increasing the number of loops of any subtest increases the relative time spent on that subtest in each pass. This increase also increases the time taken to complete a pass. LA march test attacks coupling and stuck-at-faults.
LR March Test	Specifies number of loops of LR march(14N) test, per pass. Increasing the number of loops of any subtest increases the relative time spent on that subtest in each pass. This increase also increases the time taken to complete a pass. LR march test attacks coupling and stuck-at-faults.
SS March Test	Specifies number of loops of SS march(22N) test, per pass. Increasing the number of loops of any subtest increases the relative time spent on that subtest in each pass. This increase also increases the time taken to complete a pass. SS march test attacks simple static faults.

`ramtest` Test Modes

TABLE 41-2 `ramtest` Supported Test Modes

Test Mode	**Description**
Exclusive	Generates enormous amount of memory traffic.

`ramtest` Command-Line Syntax

/opt/SUNWvts/bin/sparcv9/ramtest *standard_arguments* **[-o**

[reserve=<*Integer between 0 and 90*> **]**
[stride=<*Row | Column | Random | UserDefined | Custom*>
[userstride=<*1 - 16*> **]**
[stridemask=<*0x40 - 0x400000*>]
[lock=<*Enabled | Disabled*> **]**
[dratio=<*Integer between 0 and 100*> **]**
[eccmonitor=<*Enabled | Disabled*> **]**
[threshold=<*Integer i; 0 <= i <= MAX_INT* >**]**
[pass=<*32 bit integer*> **]**

[ntaloops=<*32 bit integer*>**]**
[laloops=<*32 bit Integer*> **]**
[lrloops=<*32 bit Integer*> **]**
[ssloops=<*32 bit Integer*>]]

TABLE 41-3 `ramtest` Command-Line Syntax

Argument	Description
`reserve`	This is used to specify the amount of memory that will not be allocated for testing. Reserve represents a percentage of the total physical memory in the system. When the test starts, it probes the total memory present in the system, then tries to allocate (100 - reserve)% of memory. If the allocation or locking does not succeed the amount of memory is reduced before the retry. Before starting the test, the amount of memory allocated for testing is displayed. Default value for reserve option is 20. For US IIIi platforms, default value is tuned to 25. It should be noted that on low memory systems, the reserve value should be kept higher to avoid excessive swapping. For 32-bit booted systems, the reserve value represents the percentage of 4 GB rather than the percentage of total physical memory.
`stride`	By default stride is set to "Random". It can be set to "Column" or "Row" also. In case of random, either Row or Column are randomly selected for each pass. Value of stride defines the memory locations addressed consecutively in certain subtests, in a hardware dependent manner. All testable memory is still tested. Using different stride checks coupling among a different set of memory cells, therefore random is the recommended value for this option unless both column and row are being explicitly used in different instances. For FA type of uses, stride may also be set to "UserDefined", in this case the test will stride the number of banks specified in the "userstride" option. Stride may be set to "Custom" in which case the stride values are randomly selected from the strides specified in the "stridemask" value.
`userstride`	Use this option to set number of banks the test should stride. One of the good choices could be the interleave on the suspect bank, during FA. the value is limited between 1 and 16 right now. (This also means row striding is not possible while using this option).

TABLE 41-3 `ramtest` Command-Line Syntax

Argument	Description
`stridemask`	When stride=custom is selected, this value specifies the strides used. Each thread selects one of the stride values from stridemask by selecting one of the bits in the mask. The bits in the stridemask value represent the Least Significant Bit of the stride. Thus a value of 0x4000 calls for a stride of 16384 (using Bit 14 of the address). Mulitple bits can be set mixing row and column strides. Consult the Memory Controller section of the PRM for the CPU of the test system to discover how the memory reference address is divided between rows and columns in the DRAM. The value can be specified as a Decimal (NNN), Hexadecimal (0xNNN), or Octal (0NNN) value. The maximum value is 0x400000 (4194304). The default value is 0xC600 which represents strides using Bits 15, 14, 10, and 9.
`lock`	By default memory locking is "Disabled". To turn it on set lock to "Enabled". The test uses ISM to lock the memory into the core, this gives 4 MB virtual pages and avoids swapping. Running without locking on the other hand, adds more randomness to the addressing sequence. It should be noted that on low memory systems, this option can be "Enabled" to avoid excessive swapping. In case the test is unable to lock the memory, the user should put the following lines in `/etc/system` and reboot the machine. set shmsys:shminfo_shmmax=0xFFFFFFFFFFFFFFFF set shmsys:shminfo_shmmin=1 set shmsys:shminfo_shmmni=100 set shmsys:shminfo_shmseg=10
`eccmonitor`	ECC Monitor is "Enabled" by default. The ECC error monitor runs as a separate thread in the test. When an ECC error is detected, the message is displayed on to the test output. The monitor can be turned off by setting this option to "Disabled".
`threshold`	This is the number of ECC errors after which the test will stop (if ECC monitor is running). When the threshold is reached the test will exit with a non zero exit code. If set to zero, the test will still report all the errors but will not stop. The default threshold is 2.
`pass`	This option specifies number of passes, in the same instance. Increasing pass is recommended in case "lock" is enabled, this will save time spent on locking the memory every time a new process/instance is spawned by the VTS kernel. Note that this pass has no relation with the system passes in the VTS infrastructure, it will appear that `ramtest` is taking longer to complete system passes.

TABLE 41-3 `ramtest` Command-Line Syntax

Argument	Description
`ntaloops`	Specifies number of loops of NTA march(30N) test, per pass. Increasing the number of loops of any subtest increases the relative time spent on that subtest in each pass. This increase also increases the time taken to complete a pass. NTA march test attacks stuck-at-faults, two cell coupling faults, and some three cell coupling faults.
`laloops`	Specifies number of loops of LA march(22N) test, per pass. Increasing the number of loops of any subtest increases the relative time spent on that subtest in each pass. This increase also increases the time taken to complete a pass. LA march test attacks coupling and stuck-at-faults.
`ntaloops`	Specifies number of loops of NTA march test, per pass. Increasing the number of loops of any subtest increases the relative time spent on that subtest in each pass. This increase also increases the time taken to complete a pass. NTA march test attacks coupling and stuck at faults.
`lrloops`	Specifies number of loops of LR march(14N) test, per pass. Increasing the number of loops of any subtest increases the relative time spent on that subtest in each pass. This increase also increases the time taken to complete a pass. LR march test attacks coupling and stuck-at-faults.
`dratio`	Descramble ratio can be used to tune the algorithm used to generate data patterns in `ramtest`. Descramble ratio of 100 means that all the data patterns generated will be descrambled. Where as if descramble ratio is 0, the test will generate the data patterns tuned towards bus noise. Default value is 50, which means that half the data patterns are descrambled.
`ssloops`	Specifies number of loops of SS march(22N) test, per pass. Increasing the number of loops of any subtest increases the relative time spent on that subtest in each pass. This increase also increases the time taken to complete a pass. SS march test attacks simple static faults.
`custom`	When `stride=custom` is selected, this value specifies the strides used. Each thread selects one of the stride values from stridemask by selecting one of the bits in the mask. The bits in the stridemask value represent the Least Significant Bit of the stride. Thus a value of 0x4000 calls for a stride of 16384 (using Bit 14 of the address). Mulitple bits can be set mixing row and column strides. Consult the Memory Controller section of the PRM for the CPU of the test system to discover how the memory reference address is divided between rows and columns in the DRAM. The value can be specified as a Decimal (NNN), Hexadecimal (0xNNN), or Octal (0NNN) value. The maximum value is 0x400000 (4194304). The default value is 0xC600 which represents strides using Bits 15, 14, 10, and 9.

Note – 32-bit tests are located in the bin subdirectory, /opt/SUNWvts/bin/*testname*.

Note – ECC errors returned by ramtest are actually detected by the operating system and are logged in the /var/adm/messages file. Please review this file for more detailed information regarding errors.

Note – 64-bit tests are located in the sparcv9 subdirectory: /opt/SUNWvts/bin/sparcv9/*testname*, or the relative path to which you installed SunVTS. If a test is not present in this directory, then it might be available as a 32-bit test only. For more information, see “32-Bit and 64-Bit Tests” on page 5.

CHAPTER **42**

Remote System Control (`rsctest`)

The `rsctest` exercises the Remote System Control (RSC) feature, which is integrated on the Sun Enterprise 250 as well as the next-generation RSC 2.0 plug-in card introduced with the Sun Fire 280R line.

The RSC provides secure remote access for system monitoring, firmware updates, and failure recovery. The RSC communicates with the host through two internal serial lines, the I2C bus, and reset lines.

The RSC 1.0 hardware consists of the controller, flash, SEEPROM, 10MB Ethernet port, and an external console serial port.

The RSC 2.0 plug-in card hardware consists of the controller, flash, SEEPROM, 10MB Ethernet port, FRUSEEPROM, Time Of Day (TOD) device, internal PCMCIA modem card, and battery backup.

`rsctest` is not scalable.

`rsctest` Subtests

The `rsctest` will present different subtests and options based on which revision of the RSC hardware it is testing.

The subtests common to both RSC 1.0 and 2.0 include:

TABLE 42-1 Subtests for both RSC 1.0 and 2.0

Subtest	Description
Ethernet	Allows for internal loopback testing, on the Ethernet device with user specified data, size, and number of packets.
	Allows for external loopback testing with user-specified data, size, and number of packets. This requires a connection to a 10MB hub or switch for RSC 1.0, or a passive loopback connector for RSC 2.0.
	Allows for a ping to be sent to a specified host and checks the response.
Flash CRC	Performs a checksum test on the flash device.
SEEPROM CRC	Performs a checksum test on the SEEPROM device.
Serial	Allows internal loopback testing with user-specified data and size on the two internal serial ports.
	Allows for internal and/or external testing on the external `ttyu` port. The external test requires a passive loopback connector.

`rsctest` also presents the following subtests when running on the RSC 2.0 hardware:

TABLE 42-2 Subtests for RSC 2.0 Only

Subtest	Description
FRU SEEPROM CRC	Performs a checksum test on the SEEPROM device.
I2C	Tests the i2c bus connection between the host and the RSC.
TOD	Performs multiple reads to the TOD device and verifies that the time is incrementing.
Modem	Verifies that the modem is installed. Displays the manufacture information, in Verbose mode. Performs AT inquiry commands.

The subtests call test modlets that are written in the native Real Time Operating System (RTOS) that resides in the RSC firmware. The `rsctest` subtests execute the test modlets, passes parameters, and retrieves results from the RSC using a test protocol on the host to RSC internal serial lines.

`rsctest` Options

To reach the dialog box below, right-click on the test name in the System Map and select Test Parameter Options. If you do not see this test in the System Map, you might need to expand the collapsed groups, or your system may not include the device appropriate to this test. Refer to the *SunVTS User's Guide* for more details.

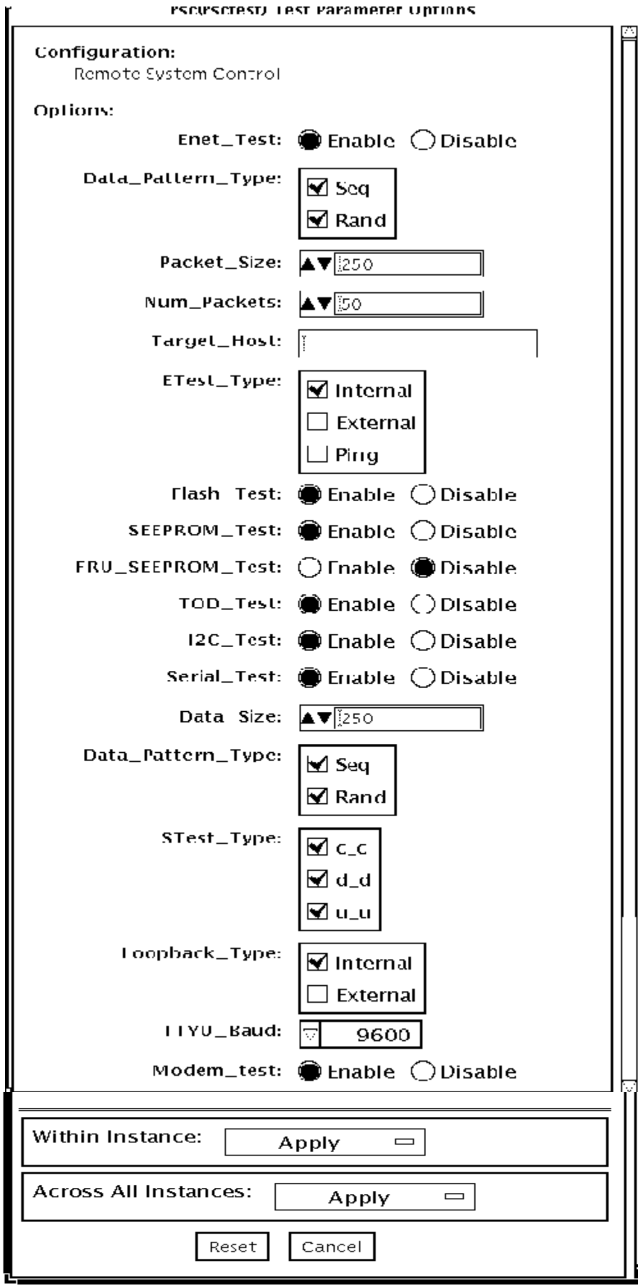


FIGURE 42-1 `rsctest` Test Parameter Options Dialog Box

TABLE 42-3 `rsctest` Options

`rsctest` **Options**	**Description**
Enet test	Enables or disables RSC Ethernet testing.
Data Pattern Type	Selects Sequential, Random, or both types of data patterns.
Packet Size	Defines the size of each data packet to be sent for all tests.
Num Packets	Specifies the number of data packets to send in one test loop.
Target Host	Specifies the IP address of a host to use for the ping test.
Enet Test Type	Selects any or all Internal, External, or ping tests.
Flash test	Enables or disables the flash checksum test.
SEEPROM test	Enables or disables the SEEPROM checksum test.
FRU SEEPROM test	Enables or disables the FRU SEEPROM checksum test (RSC 2.0 only).
TOD test	Enables or disables the Time Of Day test.
I2C test	Enables or disables the I2C test (RSC 2.0 only).
Serial test	Enables or disables the RSC serial test.
Data Size	Defines the data size to be sent.
Loopback Type	Selects Internal, External, or both. External requires a loopback plug.
Data Pattern Type	Selects Sequential, Random, or both types of data patterns.
Serial Test Type	Selects serial ports to be tested, u to u, c to c, or d to d.
TTYU_Baud	Select a fixed baud rate or all baud rates for testing the ttyu port. The valid baud rates under TTYU_Baud are: ALL, 300, 600, 1200, 2400, 4800, 9600, 14400, 19200, 38400, 57600, 76800, 115200. The default is 9600.
Modem Test	Used to Enable or Disable the RSC PCMCIA modem test (RSC 2.0 only).

`rsctest` Test Modes

`rsctest` supports Connection and Functional tests as described in the table below.

TABLE 42-4 `rsctest` Supported Test Modes

Test Mode	Description
Connection	Reports the status of the RSC.
Functional (Offline	Tests the RSC's Ethernet, flash, SEEPROM, and serial devices. All tests use internal modes as defaults. The `rsctest` will not run the serial test on ttyc if the console has been redirected to the RSC. The ttyu tests will not run if there is an open login on `ttyu`.

`rsctest` Command-Line Syntax

RSC 1.0: **/opt/SUNWvts/bin/rsctest** *standard_arguments* **-o enet=***E/D*, **epattype=***seq+rand*, **esize=***packet_size*, **epkts=***number_packets*, **target=***IP_address*, **etest=***I+E+P*, **flash=***E/D*, **seeprom=***E/D*, **serial=***E/D*, **sdatsize=***data_size*, **slb=***I+E*, **spattype=***seq+rand*, **stest=***u_u+c_c+d_d*, **ttyubaud=***baud_rate|all*

RSC 2.0: **/opt/SUNWvts/bin/rsctest** *standard_arguments* **-o enet=***E/D*, **epattype=***seq+rand*, **esize=***packet_size*, **epkts=***number_packets*, **target=***IP_address*, **etest=***I+E+P*, **flash=***E/D*, **seeprom=***E/D*, **fruseeprom=***E/D*, **tod=***E/D*, **i2c=** *E/D*, **serial=***E|D*, **sdatsize=***data_size*, **slb=***I+E*, **spattype=***seq+rand*, **stest=** *u_u+c_c+d_d*, **ttyubaud=***baud_rate|all*, **rscmodem=***E/D*

TABLE 42-5 `rsctest` Command-Line Syntax

Argument	Description
enet=*enable|disable*	Enables or disables RSC Ethernet test.
epattype=*seq+rand*	Predefined pattern options used for Enet test.
esize=*packet_size*	Data size for each packet in the Enet test.
epkts=*number_packets*	Number of packets to send for Enet test.
target=*IP_address*	IP address of target system for Enet ping test.
etest=*Internal+External+ Ping*	Selects any or all Internal, External, or ping tests.
flash=*enable|disable*	Enables or disables RSC Flash Checksum test.

TABLE 42-5 `rsctest` Command-Line Syntax

Argument	Description
`seeprom=`*enable*|*disable*	Enables or disables RSC SEEPROM checksum test.
`fruseeprom=`*E/D (RSC 2.0 ONLY)*	Enables or disables RSC FRU SEEPROM checksum test.
`tod=`*E/D (RSC 2.0 ONLY)*	Enables or disables RSC Time Of Day test.
`i2c=`*E/D (RSC 2.0 ONLY)*	Enables or disables RSC i2c test.
`serial=`*enable*|*disable*	Enables or disables RSC serial test.
`sdatsize=`*data_size*	Data size for the rsc serial tests.
`slb=`*Internal+External*	Loopback type. External N/A on ports C and D.
`spattype=`*seq+rand*	Predefined pattern options used for RSC serial test.
`stest=`*u_u+c_c+d_d*	Defines port and configuration to use for RSC serial test.
`ttyu_baud=`*ALL*|*specific_baud*	Defines baud rates to be used in testing the RSC's console port. The valid baud rates under `ttyu_baud` are: ALL, 300, 600, 1200, 2400, 4800, 9600, 14400, 19200, 38400, 57600, 76800, 115200. The default is 9600.
`rscmodem=`*E/D*	Enables or disables the RSC PCMCIA modem test.

Note – 64-bit tests are located in the `sparcv9` subdirectory: `/opt/SUNWvts/bin/sparcv9/`*testname*, or the relative path to which you installed SunVTS. If a test is not present in this directory, then it might be available as a 32-bit test only. For more information, see "32-Bit and 64-Bit Tests" on page 5.

CHAPTER **43**

Serial Asynchronous Interface (PCI) Test (`saiptest`)

`saiptest` checks the functionality of the serial asynchronous interface (SAI) card through its device driver.

Note – You must have Patch ID 109338 installed on the system where you plan to run the `saiptest`.

`saiptest` Hardware Requirements

Before running the SunVTS diagnostics software, make sure you install the device driver and the cards to be tested. Also, you should reboot your system with the `boot -r` command to reconfigure the system and allow the SunVTS kernel to recognize the new driver.

Note – You must run the `saiptest` in Intervention mode.

Note – You must have Patch ID 109338 installed on the system where you plan to run the `sapitest`.

The following minimum hardware configuration is required to successfully run the Internal test:

- PCI-based SPARC system with a PCI slot
- Serial asynchronous interface card, installed in one of the PCI slots

The following hardware is also required to run other SunVTS Serial Asynchronous Interface tests:

- Serial asynchronous interface patch panel (part no. 370-2810)
- 25-pin serial loopback plugs (part no. 540-1558)
- RS-232 serial cables (part no. 530-1685)
- TTY terminal

`saiptest` Options

To reach the dialog box below, right-click on the test name in the System Map and select Test Parameter Options. If you do not see this test in the System Map, you might need to expand the collapsed groups, or your system may not include the device appropriate to this test. Refer to the *SunVTS User's Guide* for more details.

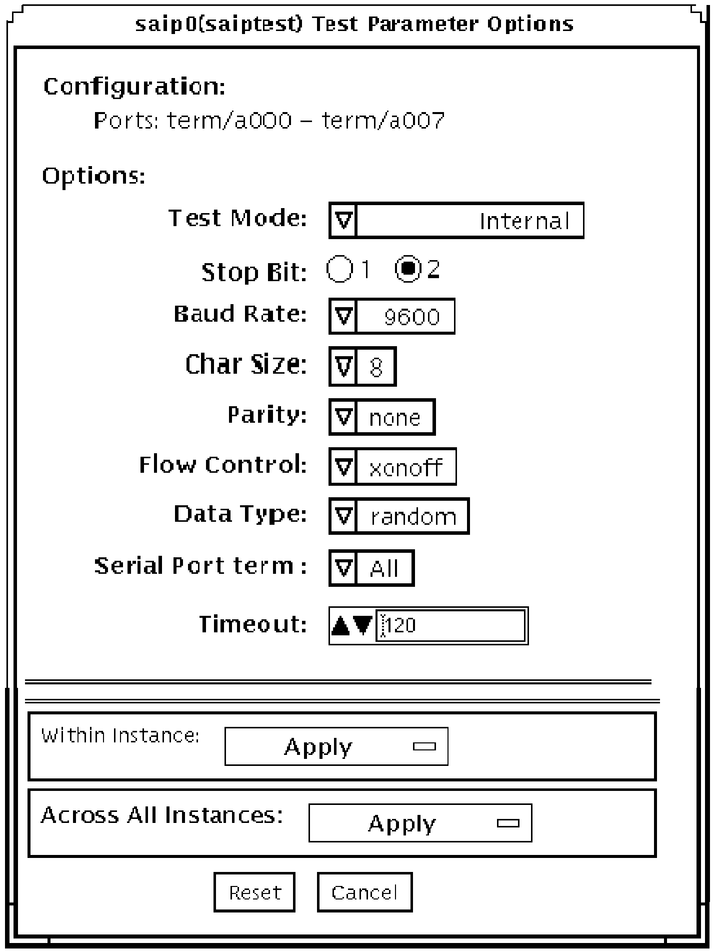


FIGURE 43-1 `saiptest` Test Parameter Options Dialog Box

The Configuration section of the Options dialog box displays the asynchronous serial ports available for the SAI board. The following table shows the available ports.

TABLE 43-1 `saiptest` Asynchronous Serial Ports

Board Number	Board Device	Serial Ports
0	saip0	term/a000-a007
1	saip1	term/b000-b007
2	saip2	term/c000-c007

TABLE 43-1 `saiptest` Asynchronous Serial Ports *(Continued)*

Board Number	Board Device	Serial Ports
3	saip3	term/d000-d007
4	saip4	term/e000-e007
5	saip5	term/f000-f007
6	saip6	term/g000-g007
7	saip7	term/h000-h007
8	saip8	term/i000-i007
9	saip9	term/j000-j007
10	saip10	term/k000-k007
11	saip11	term/l000-l007
12	saip12	term/m000-m007
13	saip 13	term/n000-n007
14	saip 14	term/o000-o007
15	saip 15	term/p00-p007

TABLE 43-2 `saiptest` Options

`saiptest` **Option**	**Description**
Internal Test	Performs internal loopback testing on the SAI card(s) installed in PCI slots. You do not need to attach anything to the card(s) to perform this test.
25-pin Loopback	Provides full-duplex transmission and full-modem loopback testing of the serial port selected in the Serial Port section of the option menu. Attach the 25-pin loopback plug to the serial port on the serial asynchronous interface patch panel that is being tested. This test cannot be run concurrently with the Echo-TTY option enabled.
Echo-TTY	Checks the proper operation of the serial port selected in the Serial Port selection of the option menu by echoing characters typed on a TTY terminal keyboard to the TTY terminal screen. The characters you type on your TTY keyboard display on the TTY screen. Note: A TTY connection to the serial asynchronous interface serial port requires corresponding character size se up. For example, if a TTY attachment is running with 8-bit character size, then the Char Size `saiptest` option should be set to 8- bits. If you do not type any characters within two minutes, this test times-out.
Baud Rate	Specifies the baud rate. Choose 110, 300, 600, 1200, 2400, 4800, 9600, 19200, or 38400 baud. Note: The baud rate of 38400 can only be used if the Internal test is disabled and you are testing one port at a time.
Char Size	Specifies the character length. Choose 5, 6, 7, or 8 characters.
Stop Bit	Specifies the number of stop bits. Choose 1 or 2 bits.
Parity	Specifies the selectable parity. Choose none, odd, or even.
Flow Control	Specifies the selectable flow control. Choose XOnOff, rtscts, or both.
Data Type	Specifies the selectable data type pattern. Choose 0x55555555 (0x55), 0xaaaaaaaa (0xaa), or random.
Serial Port	Specifies the serial port to be tested. The available ports are listed in the Configurations section at the top of the `saiptest` options menu.
Timeout	Specifies the number of seconds until the test times out. The default is 120 seconds.

`saiptest` Test Modes

TABLE 43-3 `saiptest` Supported Test Modes

Test Mode	Description
Functional (Offline)	Runs the full set of tests.

`saiptest` Command-Line Syntax

/opt/SUNWvts/bin/saiptest *standard_arguments* **-o dev=***device_name***, M=***test_mode***,B=baud_rate,Size=***character_size***,Stop=***#of_stop_bits***, Parity=***parity***,F=***flow_control***,Data=***test_pattern***,sp=***serial_port***,tout=***time_out*

TABLE 43-4 `saiptest` Command-Line Syntax

Argument	Description
dev=*device_name*	Specifies the asynchronous serial ports of the PCI card slots tested. Since there is no default, you must type a device name—either a board(saip0-16) or an individual port (term/x000-term/x007, where x is a-p): •saip0 = the 8 asynchronous serial ports in the first card •saip1 = the 8 asynchronous serial ports in the second card •saip2 = the 8 asynchronous serial ports in the third card •saip3 = the 8 asynchronous serial ports in the fourth card •saip4 = the 8 asynchronous serial ports in the fifth card •saip5 = the 8 asynchronous serial ports in the sixth card •saip6 = the 8 asynchronous serial ports in the seventh card •saip7 = the 8 asynchronous serial ports in the eighth card •saip8 = the 8 asynchronous serial ports in the ninth card •saip9 = the 8 asynchronous serial ports in the tenth card •saip10 = the 8 asynchronous serial ports in the eleventh card •saip11 = the 8 asynchronous serial ports in the twelfth card •saip12 = the 8 asynchronous serial ports in the thirteenth card •saip13 = the 8 asynchronous serial ports in the fourteenth card •saip14 = the 8 asynchronous serial ports in the fifteenth card •saip15 = the 8 asynchronous serial ports in the sixteenth card or `/dev/term/x00`*m* Where *x* is a-p and m is 0 to 7 (any of the asynchronous serial ports in PCI card slots).
M=*test_mode*	Specifies Internal, 25_pin_loopback, or Echo_TTY test mode.
B=*baud_rate*	Sets the baud rate to 110, 300, 600, 1200, 2400, 4800, 9600, 19200, 38400; the default is 9600.
Stop=*#of_stop_bits*	Toggles the number of stop bits between 1 or 2. The default is 1.
Size=*character_size*	Sets the character size as an integer between 5 and 8.
Parity=*parity*	Specifies the parity as none, odd, or even. The default is none.
F=*flow_control*	Specifies flow control as xonoff, rtscts, or both.
Data=*test_pattern*	Specifies test pattern as 0x55555555, 0xAAAAAAAA, or random.
sp=*serial_port*	Specifies the terminal and asynchronous serial port number, such as term/a00*n* (sp=*n*).
tout=*time_out*	Specifies the number of seconds until the test times out. The default is 120 seconds.

Note – 64-bit tests are located in the `sparcv9` subdirectory: `/opt/SUNWvts/bin/sparcv9/`*testname*, or the relative path to which you installed SunVTS. If a test is not present in this directory, then it might be available as a 32-bit test only. For more information, see “32-Bit and 64-Bit Tests” on page 5.

Note – The `saiptest` error messages are generated when the SunVTS Serial Asynchronous Interface discovers errors. The error descriptions that appear in the VTS interface identify probable causes for the card or test failure, and identify the Field Replaceable Unit (FRU) and recommended action, if possible. The two FRUs under test are: the Serial Asynchronous Interface card, and the patch panel with the cable attached.

CHAPTER **44**

Internal I2C Smartcard Reader Test (sc2test)

The sc2test verifies the proper functioning and integrity of the internal I2C Smartcard reader by testing the scmi2c(7d) driver.

sc2test Subtests

The sc2test consists of the following subtests:

- Register subtests:

  Register read subtest

  The Register read subtest performs read access to selected scmi2c reader registers via ioctl().

  Walking 1s subtest

  The Walking 1s subtest performs walking 1s to selected scmi2c reader registers; registers under test are saved and restored.

- AnswerToReset (ATR) subtest

  The sc2test initializes the card reader. It will power manage and reset the card. After reset, the test attempts multiple tries to read the ATRs from the insertcard to verify against a list of recognized ATRs. The cards supported are the Cyberflex and Payflex cards.

- APDU unique-ID subtest

  Based on the result of the ATR, the Application Protocol Data Unit (APDU) uniqure-ID subtest exchanges selected ISO 7816 APDUs between the card and the reader to retreive the card's unique ID.

Caution – The `sc2test` cannot run when the `ocfserv` Smartcard server application is running, because the `ocfserv` will have exclusive open on `/dev/scmi2c0`. The `sc2test` detects the `ocfserv` process running and prompts the user to kill `ocfserv`. Also, the `sc2test` cannot run if any other third party Smartcard host application has exclusive open on `/dev/scmi2c0` device.

Caution – The file `/opt/SUNWvts/bin/sc2test.atr` consists of an ATR list for the Cyberflex or Payflex cards supported. You can use an editor program to update the file to include the new ATR.

`sc2test` Options

To reach the dialog box below, right-click on the test name in the System Map and select Test Parameter Options. If you do not see this test in the System Map, you might need to expand the collapsed groups, or your system may not include the device appropriate to this test. Refer to the *SunVTS User's Guide* for more details.

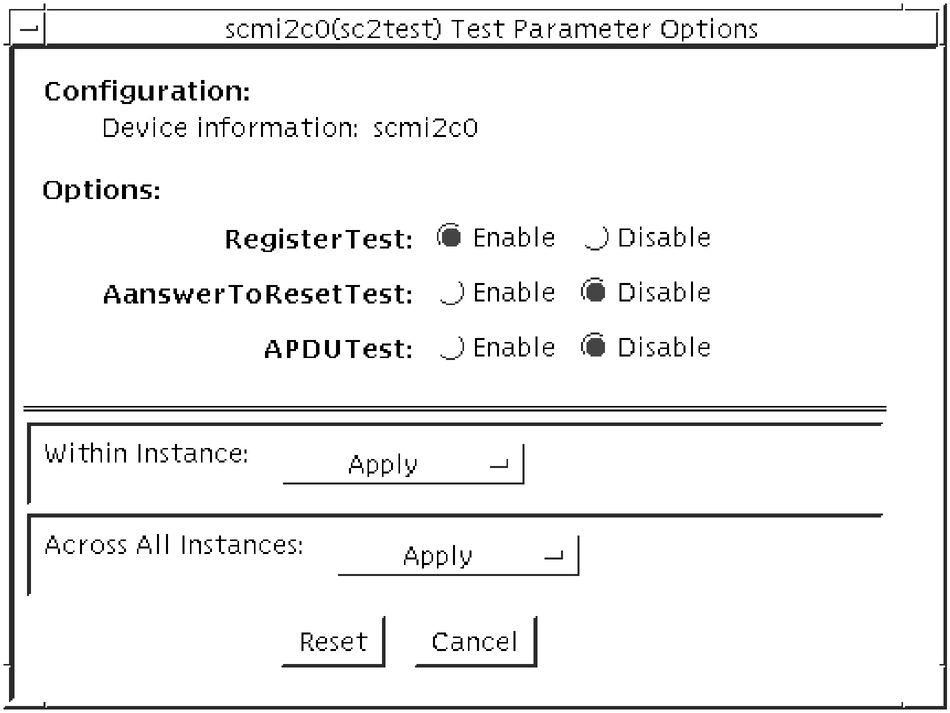


FIGURE 44-1 `sc2test` Test Parameter Options Dialog Box

TABLE 44-1 `sc2test` Options

`sc2test` **Options**	**Description**
Register Test	Enables or Disables the Register subtests; the default is Enable
AnswerToReset Test	Enables or Disables the AnswerToReset subtest; the default is Disable
APDU Test	Enables or Disables the APDU subtest; the default is Disable

`sc2test` Test Modes

TABLE 44-2 `sc2test` Supported Test Modes

Test Mode	Description
Connection	Performs the Register read and Walking 1s subtests
Functional (Offline)	Performs the Register subtests, AnswerToReset subtest, and the APDU unique-ID subtest

`sc2test` Command-Line Syntax

`/opt/SUNWvts/bin/sc2test` *standard_arguments* **`-o [`**
`[ dev=`*device_logical_name* **`]`**
`[ regs=`*enable|disable* **`]`**
`[ atr=`*enable|disable* **`]`**
`[ apdu=`*enable|disable* **`] ]`**

TABLE 44-3 `sc2test` Command-Line Syntax

Argument	Description
`dev=`*device_name*	`device_name` is the logical device name to be tested, for example, `dev=scmi2c0`
`reg=`*enable|disable*	Enables or disables the Register tests; the default is enable
`atr=`*enable|disable*	Enables or disables the ATR test; the default is disable
`apdu=`*enable|disable*	Enables or disables the APDU unique-id test; the default is disable

Note – 64-bit tests are located in the `sparcv9` subdirectory: `/opt/SUNWvts/bin/sparcv9/`*testname*, or the relative path to which you installed SunVTS. If a test is not present in this directory, then it might be available as a 32-bit test only. For more information, see “32-Bit and 64-Bit Tests” on page 5.

CHAPTER 45

SEEPROM Test (seepromtest)

The seepromtest verifies the functionality of the SEEPROM. The probing portion of the seepromtest traces the PICL (Platform Information and Control Library) tree and finds the SEEPROM nodes with physical addresses. In addition, the probing portion of seepromtest verifies the size of the physical parent of the SEEPROM. Once the probing portion is complete, seepromtest reads each byte of the SEEPROM devices to verify that the SEEPROM is the correct size. Finally, the seepromtest checks the Read operation of the SEEPROM devices.

Note – seepromtest can only be performed on platforms with one or more SEEPROM physical address in the PICL tree. Currently, seepromtest is only supported on the Sun Blade 1000/2000 workstations.

---

seepromtest Options

To reach the dialog box below, right-click on the test name in the System Map and select Test Parameter Options. If you do not see this test in the System Map, you might need to expand the collapsed groups, or your system may not include the device appropriate to this test. Refer to the *SunVTS User's Guide* for more details.

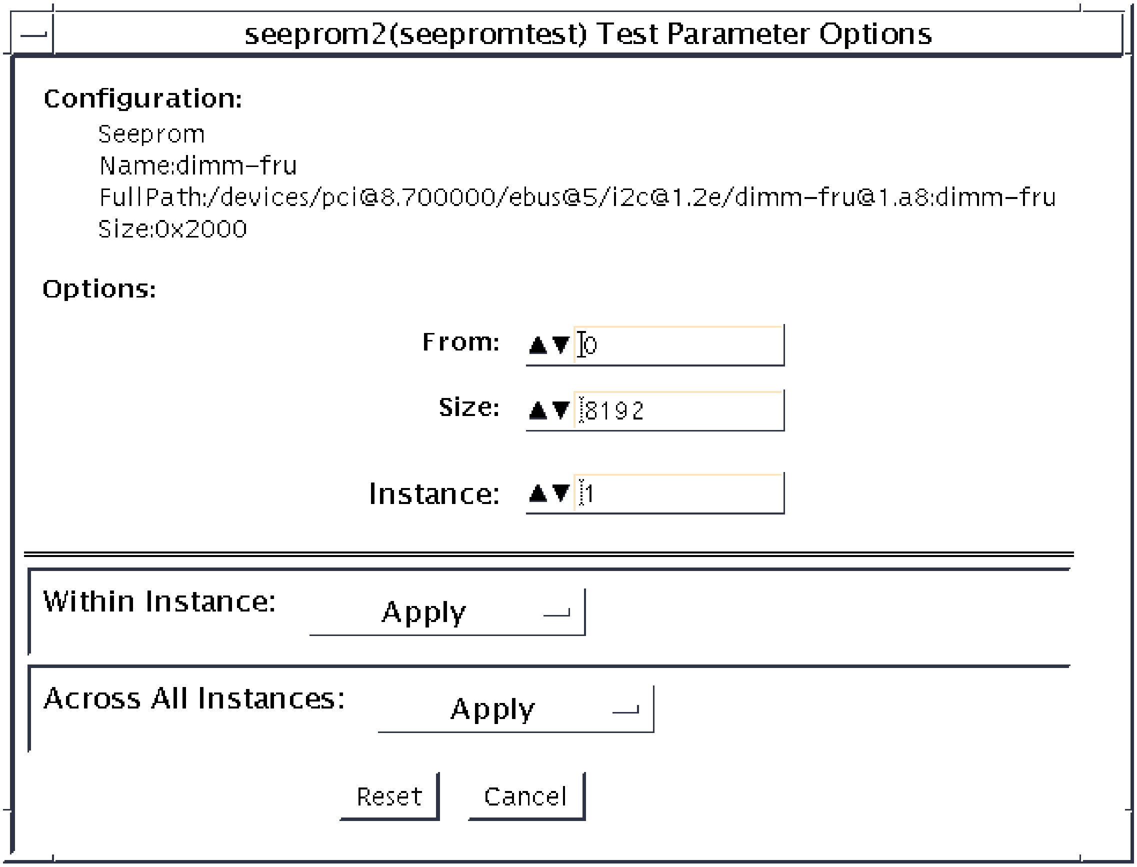


FIGURE 45-1 `seepromtest` Test Parameter Options Dialog Box

TABLE 45-1 `seepromtest` Options

`seepromtest` **Options**	**Description**
From	Specifies the number from which the offset of the SEEPROM is read.
Size	Specifies the number of bytes to be read from the SEEPROM.

seepromtest Test Modes

TABLE 45-2 seepromtest Supported Test Modes

Test Mode	Description
Connection	Performs the entire seepromtest.
Functional (Offline)	Performs the entire seepromtest.

seepromtest Command-Line Syntax

/opt/SUNWvts/bin/seepromtest *standard_arguments* **[-o**
[dev=*device_name* **]**
[from=*number* **]**
[size=*number* **]]**

TABLE 45-3 seepromtest Command-Line Syntax

Argument	Description
dev=*device_name*	The name of the SEEPROM device, for example, seeprom0, seeprom1, etc.
from=*number*	The number from which the offset is read.
size=*number*	The number of bytes to be read.

SEEPROM devices do not have device names. seepromtest assigns a device name such as seeprom0, seeprom1, seeprom2, etc. to identify them. If you do not specify a device name in the command-line syntax, the seepromtest lists the device names as seeprom0, seeprom1, seeprom2, etc., and the physical addresses.

When invoked, seepromtest displays a list of the SEEPROMs in the system and their usage. The following is an example of invoking seepromtest without any arguments. Notice the logical names on the left and physical names on the right.

```
seeprom0 : /devices/.../dimm-fru@1,a0:dimm-fru
seeprom1 : /devices/.../dimm-fru@1,a4:dimm-fru
...
```

Note – 64-bit tests are located in the `sparcv9` subdirectory: `/opt/SUNWvts/bin/sparcv9/`*testname*, or the relative path to which you installed SunVTS. If a test is not present in this directory, then it might be available as a 32-bit test only. For more information, see "32-Bit and 64-Bit Tests" on page 5.

CHAPTER **46**

Serial Ports Test (`serialtest`)

`serialtest` checks the system's on-board serial ports (`su[0,1]`, `zs[0,1]`, `zsh[0,1]`, `se[0,1]`, `se_hdlc[0,1]`, `asy[0,1]`), and any multi-terminal interface (ALM2) boards (`mcp[0-3]`). Data is written and read in asynchronous and synchronous modes using various loopback paths. However, the x86 UART driver does not support internal loopback and synchronous mode.

Note – `serialtest` now supports testing the asy driver (16550 UART). The 16550 device only works in asynchronous mode. The maximum baud rate is 115200.

Note – The 16550 UART can support 2 devices but some systems only carry one physical port (`ttyS1` or `ttyb`, `/dev/term/b`, better known as `COM2` in the x86 environment). Do not try to test port a. The operating system shows two ports but physically there is only one port.

Note – `serialtest` does support x86 platforms that use the Solaris Operating System. The internal loopback and synchronous modes of this test are not supported on x86 platforms and the maximum baud rate supported on x86 platforms is 115200.

Intervention mode must be enabled to run this test.

This test is nonscalable.

Loopback Connectors

The loopback test requires null modem and plug connectors, which are described in Appendix A.

There are a variety of loopback paths available. The internal loopback paths do not require an external connector. Their availability depends on the device. The zs(7D) device has an internal path for synchronous mode and the se(7D) device has an internal path for asynchronous mode. The exact type of loopback connector required depends on the system I/O panel.

The loopback for the "Null Modem a to b" option is a female-to-female plug. Its pin configuration is the same as the one described for the section “9-Pin to 9-Pin Port-to-Port Loopback Cable” on page 356.

The loopback for the "Plug a to a" option is described in the section “9-Pin Female Single-Port Loopback Plug” on page 354.

`serialtest` Synchronous Testing Software Requirements

If you have `zs`(7D) serial ports on your machine, the synchronous devices might not exist. Look in the `/dev` directory for `zsh` (where `h`=0 and/or 1). If they do not exist, use the following procedure to create them.

▼ To Create Synchronous Devices

1. **Enter the `add_drv zsh` command.**

```
# add_drv zsh
```

2. **Enter the `devfsadm` command. Go to the `/dev` directory to check if the device nodes for `zsh` have been created.**

```
# devfsadm
# cd /dev
# ls zsh
zsh
```

3. **If these steps do not work, enter the `rem_drv zsh` command and then repeat Steps 1 and 2.**

```
# rem_drv zsh
```

Mode and Description

Asynchronous Testing

This mode uses the asynchronous communication protocol as described in the zs(7D)and se(7D) man pages. The termio(7I) interface is used for configuring port characteristics.

The user can select the loopback paths to use, the amount of data to transfer, and the baud rate to be used for the transfer.

The test writes and reads data through the loopback path and compares the data to the original data. The test first sends a single character. If no errors or timeouts are detected, the rest of the data is simultaneously written and read, then compared for data integrity.

Synchronous Testing

Note – Synchronous mode is not supported on x86 platforms.

This mode uses the synchronous hdlc-framing interface as described in the zsh(7D) and se_hdlc(7D) man pages. Data is written and read in checksum-protected packets.

The user can select the loopback paths to use and the clock rate.

The synchronous test runs in three phases:

1. **The first phase looks for activity on the port. If no activity is detected for at least four seconds, the test proceeds to the next phase. If activity is detected,** `serialtest` **exits with an error.**

2. **The second phase attempts to send and receive one packet. If no packets are detected after five attempts, the test exits with an error. If a packet is returned, the result is compared to the original. If the length and content of the packets do not match exactly, the test exits with an error.**

3. **The third phase attempts to send many packets through the loop. Some packet drops are to be expected especially on a heavily loaded system. The test allows a percentage of the packets to be dropped. The user can set the drop tolerance between 0 percent and 99 percent.**

The default is 20 percent. If the system is extremely busy, the drop tolerance should be increased. Each packet is compared with its original for length and content. If a mismatch is detected, the test exits with an error.

This mode of testing is not available for devices connected to the super I/O port. It is, however, available for all other supported I/O ports.

`serialtest` Options

To reach the dialog box below, right-click on the test name in the System Map and select Test Parameter Options. If you do not see this test in the System Map, you might need to expand the collapsed groups, or your system may not include the device appropriate to this test. Refer to the *SunVTS User's Guide* for more details.

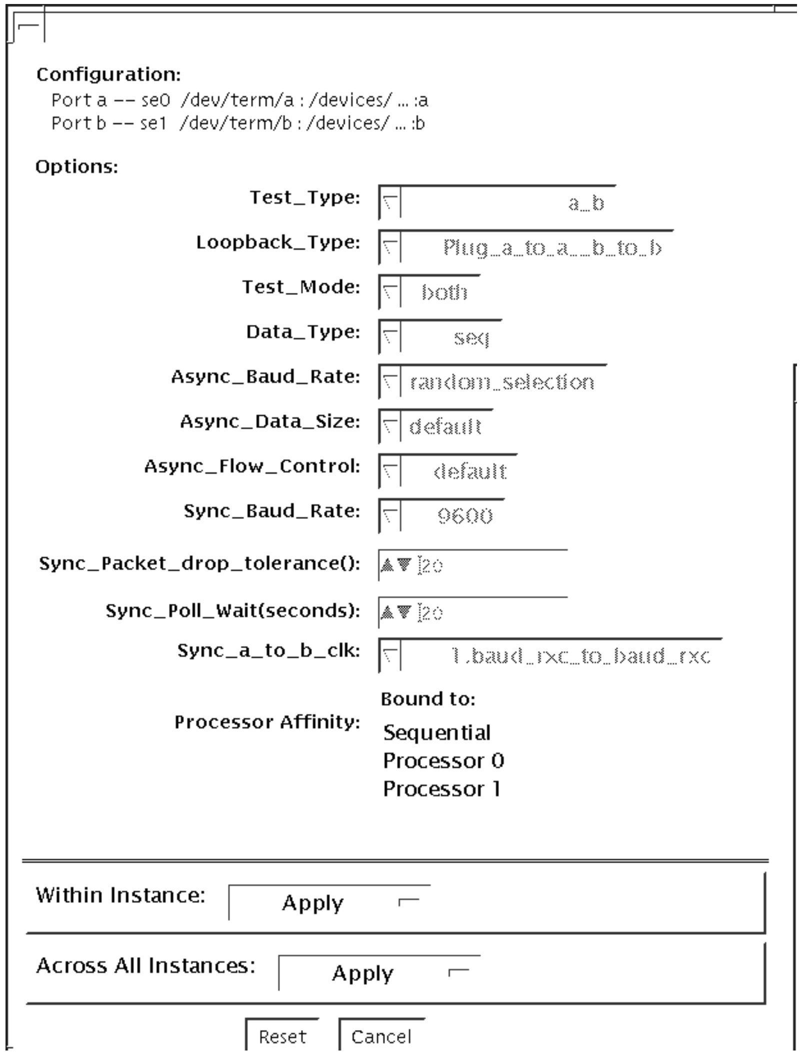


FIGURE 46-1 `serialtest` Test Parameter Options Dialog Box

TABLE 46-1 serialtest Options

Option	Description
Test Type	Selects how the test will run. Test options include: a = runs the test on port a b = runs the test on port b a_b = runs the test on ports a and b sequentially a_b_concurrent = runs the test on port a and port b concurrently.
Loopback Type	Selects the loopback test. Options include: Internal is an internal path for a, b, a_b, and a_b_concurrent test types. Plug_a_to_a__b_to_b is an external loopback plug for a, b, a_b, and a_b_concurrent test types. no_modem_a_to_b is an external loopback cable for a_to_b and a_to_b_concurrent test types. Modem_a_to_b is an external loopback cable with a modem attached to generate synchronous Transmit and Receive clocks in synchronous mode. The modem a_to_b external loopback type is intended for Sun internal use only. It requires custom equipment that is not available. (Supported only for SP devices.)
Data Type	Selects the data pattern to transfer. The user can select: • Random • Sequential • Alphanumeric • 0x00-0xff
Async Baud Rate	Selects the baud rate for Asynchronous mode testing. The valid rates are: 110, 300, 600, 1200, 4800, 9600, 19200, 38400, 57600, 76800, 115200, 153600, 230400, 307200, 460800, and "ALL". The default rate is 9600 baud. Some platforms can only support up to 38400 or 76800. If the device is connected to the super I/O port then the max baud rate supported is 115200. The test will return an error if you try to use a higher baud rate than is supported. For baud rates greater than 153600 the serial line drivers must be set for RS-423 mode and not RS-232 mode. The RS-423 and RS-232 modes are usually selected by a hardware jumper on the motherboard. Consult your hardware installation manual for more information.
Async Data Size	Selects the total number of bytes to transfer in Asynchronous mode. This can range from 1 to 10000.
Async Flow Control	Selects the type of flow control to use in asynchronous mode testing. The user can select Hardware (RTS/CTS), Software (XON/XOFF) or None. The default depends on the loopback type. Software flow control is not allowed on a, b, a_b, or a_b_concurrent loopback types.

TABLE 46-1 serialtest Options *(Continued)*

Option	Description
The following options are not available for the devices connected to the super I/O port. They are available for all other supported I/O ports.	
Test Mode	Selects the mode to run the test in. The modes available are Asynchronous, Synchronous or Both. When Both is selected, the test runs first in Asynchronous mode then Synchronous mode.
Sync Baud Rate	Selects the device generated clock rate for synchronous mode testing. The valid rates are from 110 to 230400. The rate does not have to be a specific value as required for async mode baud rates. The default rate is 9600. Some platforms can only support up to 38400 or 76800. The test will return an error if you try to use a higher rate than is supported. For rates greater than 100000, the serial line drivers must be set for RS-423 mode and not RS-232 mode. The RS-423 and RS-232 modes are usually selected by a hardware jumper on the motherboard. Consult your hardware installation manual for more information.
Sync Packet	Selects the tolerance level of Synchronous mode dropped packets during the many_packets subtest. The default is Drop20 percent. The valid range is from 0 percent to 99 percent. Some packet drops are expected especially at higher Toleranceclock rates and on a heavily loaded system.
Sync Poll Wait	Selects the number of seconds in additional time to wait for a Synchronous mode packet to be sent. Additional time may be needed when there is heavy system activity and time-outs are being detected. In general, the user can decrease the value to 0 when the system load is light or increase the value when there is a heavy system load.
The following option is available only for devices connected to the super I/O port. They do not apply to any other supported I/O ports.	
User Defined Baud Rate	Allows the user to set new baud rate values for the test. First select the User Defined option from the Async menu. Then enter the new value in the User Defined Baud Rate field.

`serialtest` Test Modes

TABLE 46-2 `serialtest` Supported Test Modes

Mode	Description
Connection	Attempts to open the port to determine if the device is connected. If it fails and the port is not busy, the test exits with an error. If it is successful or fails with a busy or exclusive use error, then the port is considered connected, and the test passes.
Functional	Performs the selected loopback test.

`serialtest` Command-Line Syntax

`/opt/SUNWvts/bin/sparcv9/serialtest` *standard*`_arguments -o dev=`*device_name*, `porta=`*port_name*, `T=`*test_type*, `L=`*loopback_type*, `M=`*mode*, `D=`*data_pattern*, `AB=`*async_baud_rate*, `S=`*async_data_size*, `par=none|even|odd`, `BS=1|10|100|1000|3000|5000|10000`, `F=`*flow_control*, `B=sync_baud_rate`, `DP=`*sync_drop_tolerance*, `P=`*sync_poll_wait*

Command-line syntax for devices connected to the super I/O port:

`/opt/SUNWvts/bin/sparcv9/serialtest` *standard_arguments* `-o dev=`*device_name*, `porta=`*port_name*, `T=`*test_type*, `L=`*loopback_type*, `D=`*data_pattern*, `AB=`*async_baud_rate*, `BS=1|10|100|1000|3000|5000|10000`, `F=`*flow_control*, `UAB=`*User_Baud_Rate*

TABLE 46-3 `serialtest` Command-Line Syntax

Argument	Description
`dev=`*device_name*	Identifies the serial port(s) to test. There is no default value. You must specify a device name such as: • `se0` • `zs0`, `zs1` • `zs2`, `zs3` • `su0`
`porta=`*port_name*	The name of the first device of a serial device pair. The default is `a`.
`T=`*test_type*	Specifies the type of test to run: • a = runs the test on port a. • b = runs the test on port b. • a_b = runs the test on ports a and b sequentially. • a_b_concurrent = runs the test on port a and port b concurrently. • a_to_b = runs the test from port a to port b.
`L=`*loopback_type*	The type of loopback connector attached to ports: • No_modem_a_to_b • Internal_a_to_a__b_to_b • Plug_a_to_a__b_to_b • Modem_a_to_b
`M=`*mode*	The default test mode is asynchronous. Specify one of the following modes: • asynch • synch • both
`D=`*data_pattern*	Selects the data pattern to transfer. The user can select: • Random • Sequential • Alphanumeric • 0x00-0xFF

TABLE 46-3 *(Continued)* `serialtest` Command-Line Syntax

Argument	Description
AB=*async_baud_rate*	Asynchronous baud rate (default = 9600). The valid values are between 110 - 460800. Note: Some platforms can only support asynchronous baud rates up to 38400 or 76800. For baud rates greater than 153600 the serial line drivers must be set for RS-423 mode and not RS-232 mode.
S=*async_data_size*	Asynchronous mode total number of bytes to write; from 1 to 10000 bytes.
`par=none|even|odd`	Parity used in the async loop test. Default value is none.
`BS= 1|10|100|1000|3000|5000|10000`	Number of bytes in each write during async loop test. Default value is 100.
F=*flow_control*	Asynchronous mode flow control: • Hardware (RTS/CTS) • Software (xon/xoff) • None
B=*sync_baud_rate*	Synchronous baud rate (default = 9600). The valid rates are between 110 - 256000. Note: Some platforms can only support synchronous rates up to 38400 or 76800. For rates greater than 100000 the serial line drivers must be set for RS-423 mode and not RS-232 mode.
DP=*sync_drop_tolerance*	Synchronous mode drop packet tolerance (default=20 percent).
P=*sync_poll_wait*	Synchronous mode additional wait time during poll (in seconds).
UAB=*User_Baud_Rate*	The user can specify any valid baud rate. To do this, AB should be set to "u".

CHAPTER 47

Serial Parallel Controller Test (`spiftest`)

The `spiftest` accesses card components such as the cd-180 and ppc2 chips, and the serial and parallel ports through the serial parallel controller device driver.

`spiftest` Hardware Requirements

Before running the SunVTS system exerciser, make sure you install the cards to be tested and the device driver. You should also reboot your system with the `boot -r` command to reconfigure the system and allow the SunVTS kernel to recognize the new driver.

Note – The `spiftest` must be run in Intervention mode.

The following minimum hardware configuration is required to successfully run the Internal test:

- SBus-based SPARC desktop system with an SBus slot
- Serial parallel controller card, installed in one of the SBus slots

The following hardware is also required to run the other SunVTS serial parallel controller tests:

- Serial parallel controller patch panel (part number 540-2007)
- 96-pin loopback plugs (part number 370-1366)
- 25-pin serial loopback plugs (part number 540-1558)
- RS-232 serial cables (part number 530-1685)
- TTY terminal

spiftest Options

To reach the dialog box below, right-click on the test name in the System Map and select Test Parameter Options. If you do not see this test in the System Map, you might need to expand the collapsed groups, or your system may not include the device appropriate to this test. Refer to the *SunVTS User's Guide* for more details.

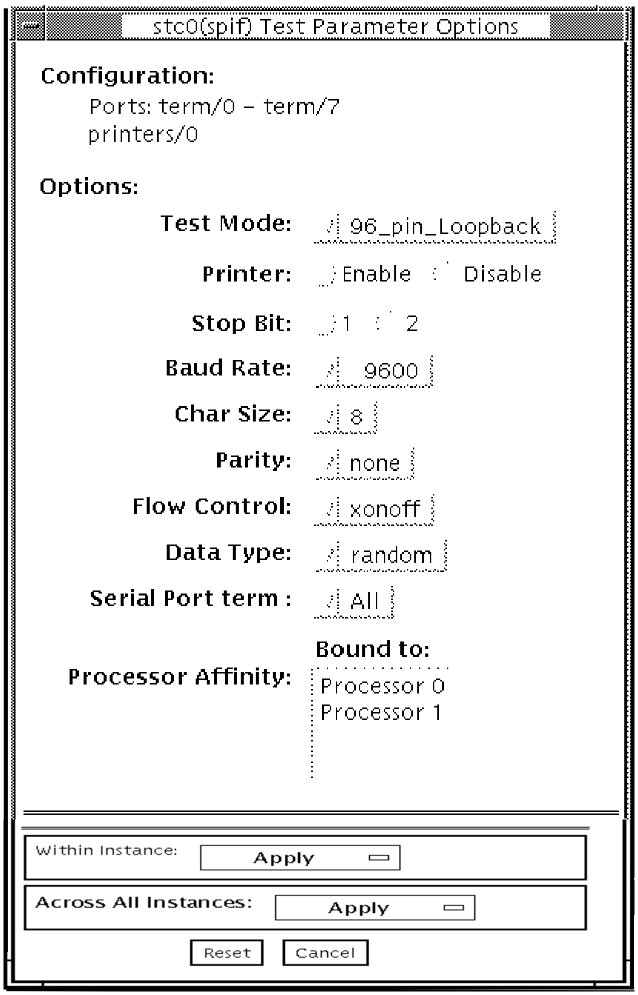


FIGURE 47-1 `spiftest` Test Parameter Options Dialog Box

The Configuration section of the Options dialog box displays the serial ports available for the SPC/S board. The available ports are listed in the table below.

TABLE 47-1 `spiftest` Serial Ports for the SPC/S Board

Board Number	Board Device	Serial Ports	Parallel Ports
0	stc0	term/0-7	printers/0
1	stc1	term/8-15	printers/1
2	stc2	term/16-23	printers/2
3	stc3	term/24-31	printers/3
4	stc4	term/32-39	printers/4
5	stc5	term/40-47	printers/5
6	stc6	term/48-55	printers/6
7	stc7	term/56-63	printers/7

The `spiftest` options are described in the table below.

TABLE 47-2 `spiftest` Options

spiftest Option	Description
96-pin Loopback (LB)	Provides data transmission, full-modem loopback, and parallel port loopback testing. You *must* attach a 96-pin loopback connector (part number 370-1366) to the card before running this test (see Appendix A, “96-Pin Female Loopback Connector” section).
Internal test	Performs a quick internal check of the serial parallel controller card(s) installed in SBus slots. You do not need to attach anything to the card(s) to perform this test.
25-pin Loopback (LB)	Provides full-duplex transmission and full-modem loopback testing of the serial port selected in the Serial Port selection of this menu. You *must* attach the 25-pin Loopback plug to the serial port on the Serial Parallel Controller Patch Panel that is being tested (see Appendix A). This test cannot be run concurrently with the Echo-TTY option enabled.

TABLE 47-2 `spiftest` Options

spiftest Option	Description
Echo-TTY	Checks the proper operation of the serial port selected in the Serial Port section of this menu by echoing characters typed on a TTY terminal keyboard to the TTY terminal screen. The characters you type should be displayed on the TTY screen. Note: TTY connection to the `spif` serial port requires corresponding character size setup. For example, if a TTY attachment is running with 8-bit character size, then the `spiftest` option 'Char Size' should also be set to 8 bits. If you do not type within two minutes, this test will time-out. Terminate testing by pressing Control-C. After a short delay, the Status window updates the Pass Count. This test cannot be run concurrently with the 25-pin Loopback subtest.
Printer	Sends the entire ASCII character set to a parallel printer. You must attach a parallel printer to the parallel port on the Serial Parallel Controller patch panel. Observe the printer output to validate the test.
Baud Rate	Specifies the baud rate; choose 110, 300, 600, 1200, 2400, 4800, 9600, 19200, or 38400 baud. Note: The baud rate of 38400 can only be used if one port is tested at a time and the Internal Test is disabled.
Char Size	Indicates character length. Choose 5, 6, 7, or 8 characters.
Stop Bit	Specifies the number of stop bits. Choose 1 or 2 bits.
Parity	Specifies the selectable parity. Choose `none`, `odd` or `even.`
Flow Control	Specifies the selectable flow control. Choices are `xonoff`, `rtscts`, or `both.`
Data Type	Specifies the selectable data type pattern. It can be 0x55555555 (0x55), 0xaaaaaaaa (0xaa), or random.
Serial Port	Specifies the serial port to be tested. The available ports are listed in the Configurations section at the top of the `spiftest` Options dialog box.

You can also change the test options by modifying the `/opt/SUNWvts/bin/.customtest` file. See "Adding Your Own Tests" in `.customtest` in the *SunVTS User's Guide*.

`spiftest` Test Modes

TABLE 47-3 `spiftest` Supported Test Modes

Test Mode	Description
Functional (Offline)	Runs the full set of tests.

`spiftest` Command-Line Syntax

`/opt/SUNWvts/bin/spiftest` *standard_arguments* **`-o dev=`***device_name*, **`M=`** *test_mode*,**`Ptr=`***enable/disable*,**`B=`***baud_rate*,**`Size=`***character_size*,**`S=`***#of_stop_bits*, **`Parity=`***parity*,**`F=`***flow_control*,**`Data=`***test_pattern*,**`sp=`***serial_port*

TABLE 47-4 `spiftest` Command-Line Syntax

Argument	Description
`dev=`*device_name*	Specifies the serial ports in SBus card slots (0-63) being tested. Since there is no default, you must type a board name: • `stc0`—the 8 serial ports in the first card • `stc1`—the 8 serial ports in the second card • `stc2`—the 8 serial ports in the third card • `stc3`—the 8 serial ports in the fourth card • `stc4`—the 8 serial ports in the fifth card • `stc5`—the 8 serial ports in the sixth card • `stc6`—the 8 serial ports in the seventh card • `stc7`—the 8 serial ports in the eighth card
`M=`*test_mode*	Specifies `Internal, 96_pin_Loopback, 25_pin_loopback,` or `Echo_TTY` test mode.
`Ptr=`*printer_test*	Enables or disables the Printer subtest.
`B`=*baud_rate*	Sets the baud rate to 110, 300, 600, 1200, 2400, 4800, 9600, 19200, or 38400. The default is 9600. To use the 38400 rate, only one port at a time can be tested, and the `Internal` test must be disabled.
`Stop=`*#of_stop_bits*	Toggles the number of stop bits between 1 or 2. The default is 1.
`Size=`*character_size*	Sets character size as a number between 5 and 8.
`P=`*parity*	Specifies the parity as none, odd, or even. The default is none.

TABLE 47-4 `spiftest` Command-Line Syntax

Argument	Description
F=*flow_control*	Specifies flow control as `xonxoff,rtscts`, or both.
Data=*test_pattern*	Specifies test pattern as 0x55555555, 0xAAAAAAAA, or random.
sp=*serial_port*	Specifies the terminal and serial port number, such as `term/3`.

Note – 64-bit tests are located in the `sparcv9` subdirectory: `/opt/SUNWvts/bin/sparcv9/`*testname*, or the relative path to which you installed SunVTS. If a test is not present in this directory, then it might be available as a 32-bit test only. For more information, see “32-Bit and 64-Bit Tests” on page 5.

CHAPTER **48**

System Service Processor Test (`ssptest`)

The `ssptest` exercises the Remote System Control (RSC) feature, which is integrated on the Sun Enterprise 250 as well as the next-generation RSC 2.0 plug-in card introduced with the Sun Fire 280R line, and Advanced Lights-Out Management (ALOM) feature. The ALOM feature is integrated into the Sun Fire V210, Sun Fire V240, Sun Fire V440, and Sun Netra 440 systems.

The RSC or ALOM provides secure remote access for system monitoring, firmware updates, and failure recovery. The RSC or ALOM communicates with the host through two internal serial lines, the I2C bus, and reset lines.

The RSC 1.0 hardware consists of the controller, flash, SEEPROM, 10MB Ethernet port, and an external console serial port.

The RSC 2.0 plug-in card hardware consists of the controller, flash, SEEPROM, 10MB Ethernet port, FRUSEEPROM, Time of Day (ToD) device, internal PCMCIA modem card, and battery backup.

The ALOM hardware consists of a Motorola MPC850 processor, flash, SEEPROM, 10MB/100MB Ethernet Port, FRUSEEPROM, Time of Day (ToD) device, Serial Transceiver, and battery backup.

`ssptest` is not scalable.

`ssptest` Subtests

The `ssptest` will present different subtests and options based on which type of hardware (RSC or ALOM) and which version of RSC hardware (1.0 or 2.0) it is testing.

The subtests common to RSC 1.0, RSC 2.0, and ALOM include:

TABLE 48-1 Subtests for Both RSC 1.0, RSC 2.0, and ALOM

Subtest	Description
Ethernet	Allows for internal loopback testing, on the Ethernet device with user specified data, size, and number of packets.
	Allows for external loopback testing with user-specified data, size, and number of packets. This requires a connection to a 10MB hub or switch for RSC 1.0, or a passive loopback connector for RSC 2.0, and ALOM.
	Allows for a ping to be sent to a specified host and checks the response.
Flash CRC	Performs a checksum test on the flash device.
SEEPROM CRC	Performs a checksum test on the SEEPROM device.
Serial	Allows internal loopback testing with user-specified data and size on the two internal serial ports.
	Allows for internal and/or external testing on the external `ttyu` port. The external test requires a passive loopback connector.

`ssptest` also presents the following subtests when running on the RSC 2.0 hardware:

TABLE 48-2 Subtests for RSC 2.0 Only

Subtest	Description
FRU SEEPROM CRC	Performs a checksum test on the SEEPROM device.
I2C	Tests the i2c bus connection between the host and the RSC.
ToD	Performs multiple reads to the ToD device and verifies that the time is incrementing.
Modem	Verifies that the modem is installed. Displays the manufacture information, in Verbose mode. Performs AT inquiry commands.

`ssptest` presents the following subtests when running on the ALOM hardware:

TABLE 48-3 Subtests for ALOM Only

Subtest	Description
I2C	Tests the i2c bus connection between the host and the ALOM.
ToD	Performs multiple reads to the ToD device and verifies that the time is incrementing.
FRU SEEPROM CRC	Performs a checksum test on the SEEPROM device. Note: The FRU SEEPROM CRC subtest is not enabled in `ssptest` on platforms using ALOM hardware with ALOM firmware. On these platforms, currently, `i2c2test` performs the checksum test on the SEEPROM device in ALOM hardware.

The subtests call test modlets that are written in the native Real Time Operating System (RTOS) that resides in the RSC firmware. The `ssptest` subtests execute the test modlets, pass parameters, and retrieve results from the RSC or ALOM using a test protocol on the host to RSC or ALOM internal serial lines.

`ssptest` Options

To reach the dialog box below, right-click on the test name in the System Map and select Test Parameter Options. If you do not see this test in the System Map, you might need to expand the collapsed groups, or your system may not include the device appropriate to this test. Refer to the *SunVTS User's Guide* for more details.

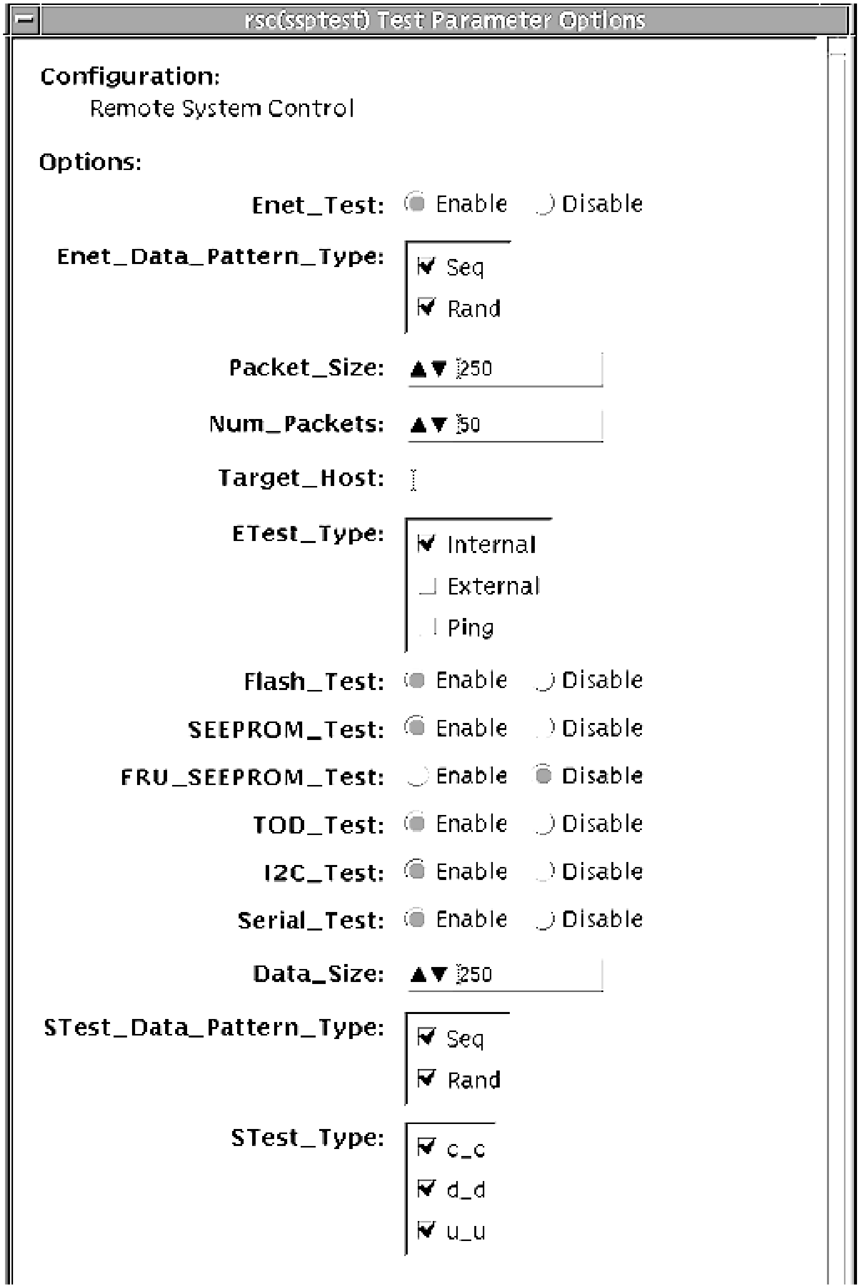


FIGURE 48-1 `ssptest` Test Parameter Options Dialog Box (Top Section)

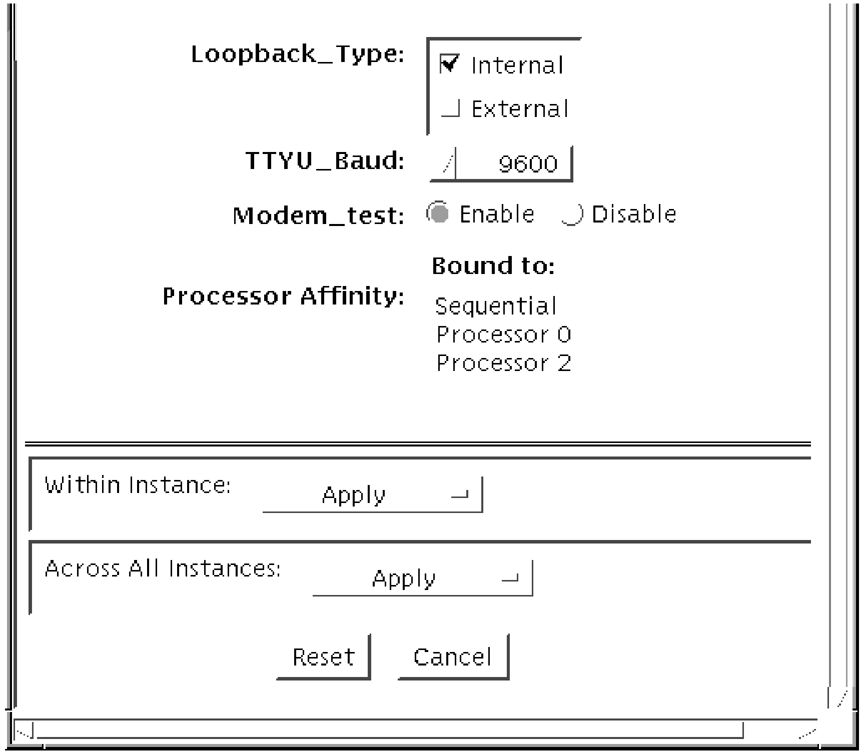


FIGURE 48-2 `ssptest` Test Parameter Options Dialog Box (Bottom Section)

Note – The Configuration field in the `ssptest` Test Parameter Options dialog box displays the which type of hardware (RSC or ALOM) is being tested. For RSC 1.0 and 2.0, *Remote System Control* is displayed. For ALOM, *Advanced Lights-Out Management* is displayed.

TABLE 48-4 `ssptest` Options

`ssptest` **Options**	**Description**
Enet test	Enables or disables RSC or ALOM Ethernet testing.
Data Pattern Type	Selects Sequential, Random, or both types of data patterns.
Packet Size	Defines the size of each data packet to be sent for all tests.
Num Packets	Specifies the number of data packets to send in one test loop.
Target Host	Specifies the IP address of a host to use for the ping test.
Enet Test Type	Selects any or all Internal, External, or ping tests.

TABLE 48-4 `ssptest` Options *(Continued)*

`ssptest` **Options**	**Description**
Flash test	Enables or disables the flash checksum test.
SEEPROM test	Enables or disables the SEEPROM checksum test.
FRU SEEPROM test	Enables or disables the FRU SEEPROM checksum test. (RSC 2.0 and ALOM only).
TOD test	Enables or disables the Time Of Day test.
I2C test	Enables or disables the I2C test (RSC 2.0 and ALOM only).
Serial test	Enables or disables the RSC or ALOM serial test.
Data Size	Defines the data size to be sent.
Loopback Type	Selects Internal, External, or both. External requires a loopback plug.
Data Pattern Type	Selects Sequential, Random, or both types of data patterns.
Serial Test Type	Selects serial ports to be tested, u to u, c to c, or d to d.
TTYU_Baud	Select a fixed baud rate or all baud rates for testing the ttyu port. The valid baud rates under TTYU_Baud are: ALL, 300, 600, 1200, 2400, 4800, 9600, 14400, 19200, 38400, 57600, 76800, 115200. The default is 9600.
Modem Test	Used to Enable or Disable the RSC PCMCIA modem test (RSC 2.0 only).

`ssptest` Test Modes

`ssptest` supports the following tests as described in the table below.

TABLE 48-5 `ssptest` Supported Test Modes

Test Mode	**Description**
Connection	Reports the status of the RSC or ALOM.
Exclusive	Tests the RSC's and ALOM's Ethernet, flash, SEEPROM, ToD, I2C, and serial devices. All tests use the internal modes as defaults. The `ssptest` will not run the serial test on `ttyc` if the console has been redirected to the RSC. The `ttu` tests will not run if there is an open login on the `ttyu`.

`ssptest` Command-Line Syntax

RSC 1.0: **/opt/SUNWvts/bin/ssptest** *standard_arguments* **-o enet=***E/D*, **epattype=***seq+rand*, **esize=***packet_size*, **epkts=***number_packets*, **target=***IP_address*, **etest=***I+E+P*, **flash=***E/D*, **seeprom=***E/D*, **serial=***E/D*, **sdatsize=***data_size*, **slb=***I+E*, **spattype=***seq+rand*, **stest=***u_u+c_c+d_d*, **ttyubaud=***baud_rate|all*

RSC 2.0: **/opt/SUNWvts/bin/ssptest** *standard_arguments* **-o enet=***E/D*, **epattype=***seq+rand*, **esize=***packet_size*, **epkts=***number_packets*, **target=***IP_address*, **etest=***I+E+P*, **flash=***E/D*, **seeprom=***E/D*, **fruseeprom=***E/D*, **tod=***E/D*, **i2c=** *E/D*, **serial=***E|D*, **sdatsize=***data_size*, **slb=***I+E*, **spattype=***seq+rand*, **stest=** *u_u+c_c+d_d*, **ttyubaud=***baud_rate|all*, **rscmodem=***E/D*

ALOM: **/opt/SUNWvts/bin/ssptest** *standard_arguments* **-o enet=***E/D*, **epattype=***seq+rand*, **esize=***packet_size*, **epkts=***number_packets*, **target=***IP_address*, **etest=***I+E+P*, **flash=***E/D*, **seeprom=***E/D*, **tod=***E/D*, **i2c=***E/D*, **serial=** *E/D*, **sdatsize=***data_size*, **slb=***I*, **spattype**=*seq+rand*, **stest=***d_d*

TABLE 48-6 `ssptest` Command-Line Syntax

Argument	Description
enet=*enable|disable*	Enables or disables RSC or ALOM Ethernet test.
epattype=*seq+rand*	Predefined pattern options used for Enet test.
esize=*packet_size*	Data size for each packet in the Enet test.
epkts=*number_packets*	Number of packets to send for Enet test.
target=*IP_address*	IP address of target system for Enet ping test.
etest=*Internal+External+Ping*	Selects any or all Internal, External, or ping tests.
flash=*enable|disable*	Enables or disables RSC or ALOM Flash checksum test.
seeprom=*enable|disable*	Enables or disables RSC or ALOM SEEPROM checksum test.
fruseeprom=*E/D (RSC 2.0 and ALOM ONLY)*	Enables or disables RSC FRU SEEPROM checksum test.
tod=*E/D (RSC 2.0 and ALOM ONLY)*	Enables or disables RSC or ALOM Time of Day test.
i2c=*E/D (RSC 2.0 and ALOM ONLY)*	Enables or disables RSC or ALOM i2c test.
serial=*enable|disable*	Enables or disables RSC or ALOM serial test.
sdatsize=*data_size*	Data size for the `rsc` or `alom` serial tests.
slb=*Internal+External*	Loopback type. External N/A on ports C and D.

TABLE 48-6 `ssptest` Command-Line Syntax *(Continued)*

Argument	Description
spattype=*seq+rand*	Predefined pattern options used for RSC or ALOM serial test.
stest=*u_u+c_c+d_d*	Defines port and configuration to use for RSC or ALOM serial test.
ttyu_baud=*ALL|specific_baud*	Defines baud rates to be used in testing the RSC's console port. The valid baud rates under `ttu_baud` are: ALL, 300, 600, 1200, 2400, 4800, 9600, 14400, 19200, 38400, 57600, 76800, 115200. The default is 9600.
rscmodem=*E/D (RSC2.0 Only)*	Enables or disables the RSC PCMCIA modem test.

Note – 64-bit tests are located in the `sparcv9` subdirectory: `/opt/SUNWvts/bin/sparcv9/`*testname*, or the relative path to which you installed SunVTS. If a test is not present in this directory, then it might be available as a 32-bit test only. For more information, see "32-Bit and 64-Bit Tests" on page 5.

CHAPTER 49

SunHSI Board Test (sunlink)

The sunlink test verifies the functionality of the SBus and PCI bus SunHSI™ boards by using the HDLC protocol. sunlink initializes and configures the selected channel.

Next, sunlink opens a datagram socket and tries to modify the socket to accept ioctl communications with the driver, and receive synchronous mode information from it.

sunlink then opens the ports, linking the upper and lower layers with ioctl calls. After initialization, this test checks for activity before attempting to send or receive data. An error message is returned if activity is detected; otherwise the transmit buffer is filled with random data. Random data is used by default. You may also specify other patterns. The data is then transmitted. If the transmission succeeds, sunlink then receives the returned data and verifies that it is identical to what was sent. Finally, statistics about the send and receive are gathered from the socket.

A full sunlink test takes approximately eight minutes per port and makes a brief check of the board ports before the actual test begins. If the port is bad, the test immediately aborts and returns an error message.

sunlink Test Requirements

This test will not pass unless you install the correct loopback connectors or port to port cables on the ports you are testing. The ports specified for test in the Options dialog box must have loopback connectors attached. See Appendix A for loopback connector part numbers and wiring instructions.

`sunlink` Options

To reach the dialog box below, right-click on the test name in the System Map and select Test Parameter Options. If you do not see this test in the System Map, you might need to expand the collapsed groups, or your system may not include the device appropriate to this test. Refer to the *SunVTS User's Guide* for more details.

The Configuration field displays the available ports. (See FIGURE 49-1.)

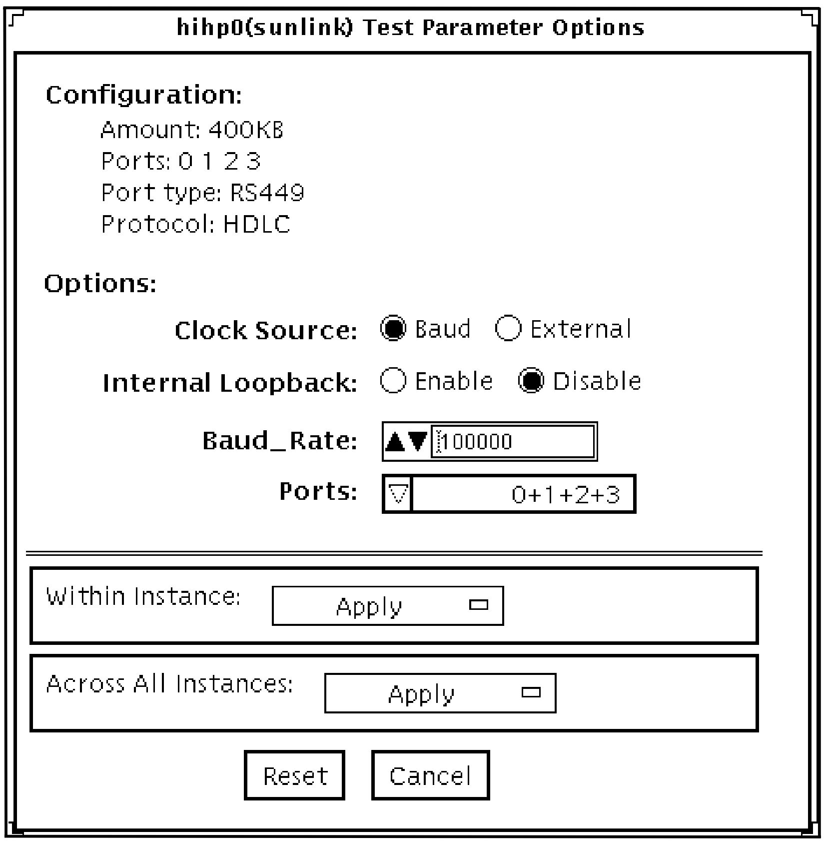


FIGURE 49-1 `sunlink` Test Parameter Options Dialog Box

TABLE 49-1 `sunlink` Options

`sunlink` **Options**	**Description**
Clock source	Select either the onboard clock or an external clock for use when using `sunlink`. To use the external clock option, the transmit, receive, and clock data lines must be physically looped back.
Internal Loopback	Enables or disables internal loopback tests. Internal Loopback is only needed when the Loopback setting is not port-to-port, and the clock source is onboard.
Baud Rate	Specifies the bit rate transfer speed from 9600bs to 2.048mbs.
Port	Specifies the loopback type—simple single external port loopback, multiple external port loopback, and port-to-port external loopback.

`sunlink` Loopback Connectors

Refer to Appendix A of this manual for information on SunLink™ loopback cables and loopback connectors. Refer to the High Speed Serial Interface hardware manuals for information on null modem cables.

sunlink Test Modes

TABLE 49-2 sunlink Supported Test Modes

Test Mode	Description
Functional (Offline)	Runs the full set of tests.

sunlink Command-Line Syntax

/opt/SUNWvts/bin/sunlink *standard_arguments* **-o dev=***device_name***,p=***port#***,**
P=*data_pattern***,brate**=*speed_n***,I,C=***clocksource*

TABLE 49-3 sunlink Command-Line Syntax

Argument	Explanation
dev=*device_name*	Specifies the device to be tested. Use hih0 for the HDLC protocol.
p=*ports*	Specifies the port number to be tested.
P=*data_pattern*	Specifies the *data_pattern* as one of the following: • c—Character (0x55) • i—Incrementing • d—Decrementing • r—Random (default)
brate=*speed_n*	Specifies the bit rate transfer speed from 9600bs to 2.048mbs.
I	Enables internal loopback for HSI.
c=*clocksource*	Specifies the clock source value as one of the following: • B—Onboard clock source • E—External clock source

The following is a typical command-line syntax for testing a SunHSI board:

```
# /opt/SUNWvts/bin/sunlink -o dev=hih0,P=0+1+2+3,brate=100000
```

This command tests the internal loopback for ports 0, 1, 2, and 3. It does not run for the port to port internal loopback test.

Note – 64-bit tests are located in the `sparcv9` subdirectory: `/opt/SUNWvts/bin/sparcv9/`*testname*, or the relative path to which you installed SunVTS. If a test is not present in this directory, then it might be available as a 32-bit test only. For more information, see "32-Bit and 64-Bit Tests" on page 5.

CHAPTER **50**

SunPCi II Test (`sunpci2test`)

The `sunpci2test` tests the SunPCi™ II card, which is a PC processor embedded in an add-on card. This test consists of approximately 150 POST routines that perform diagnostic, hardware detection, and initialization functions. This test issues a reset, then launches POST in the SunPCi II BIOS to check the devices. Finally, the sunpci2test runs bridge and system diagnostics tests.

SunPCi-2 and SunPCi-3 cards are tested by the `sunpci2test` diagnostic. If the card under test is SunPCi-2 then the device name will be `sunpci2drvX`. If it is SunPCi-3 then the device name will be `sunpci3drvX`.

`sunpci2test` Test Requirements

Before running the test, the X-window for Microsoft Windows must be shut down. If this is not done, the test will not launch.

▼ To Shut Down Microsoft Windows and the SunPCi II Card:

1. **Click Start button in Microsoft Windows.**
2. **Click Shut Down.**

   The shutdown window appears. Wait for the "It is now safe to shut off your PC" message.
3. **Select "File" from the SunPCi window.**
4. **Select "Exit" from the file menu.**

5. **Click OK.**

sunpci2test Options

To reach the dialog box below, right-click on the test name in the System Map and select Test Parameter Options. If you do not see this test in the System Map, you might need to expand the collapsed groups, or your system may not include the device appropriate to this test. Refer to the *SunVTS User's Guide* for more details.

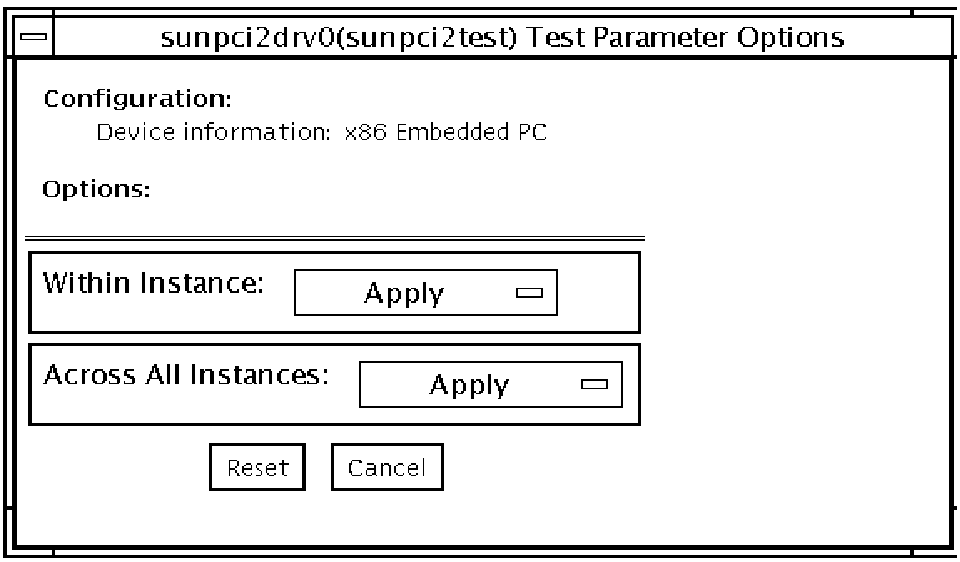


FIGURE 50-1 `sunpci2test` Test Parameter Options Dialog Box

`sunpci2test` only runs with the default parameters in place. Thus, this test does not allow any options to be configured specifically for an individual system. The number of instances is preset to 1 (the default value), as only one local copy of the test is supported.

`sunpci2test` Test Modes

TABLE 50-1 `sunpci2test` Supported Test Modes

Test Mode	Description
Connection	Runs the full set of tests.
Functional (Offline)	Runs the full set of tests.

`sunpci2test` Command-Line Syntax

`/opt/SUNWvts/bin/sunpci2test` *standard_arguments*

Note – There are no test-specific options for `sunpci2test`.

Note – 64-bit tests are located in the `sparcv9` subdirectory: `/opt/SUNWvts/bin/sparcv9/`*testname*, or the relative path to which you installed SunVTS. If a test is not present in this directory, then it might be available as a 32-bit test only. For more information, see “32-Bit and 64-Bit Tests” on page 5.

CHAPTER **51**

System Test (`systest`)

The `systest` checks the overall functionality of a Sun system by exercising the CPU, I/O, and Memory channels simultaneously.

Note – `systest` does support x86 platforms on Solaris.

Note – `systest` has been enhanced to enable the Cpu Test subtest on x86 systems. `systest` now supports the same set of options for both SPARC and x86.

The test ensures the concurrency of the different channels by the use of Solaris threads. The test aims at stimulating failures that might be caused due to the interaction of the various different hardware modules in the system. It is very stressful on the CPU, and stresses the parallel computational capability of a multiprocessor system.

`systest` Options

To reach the dialog box below, right-click on the test name in the System Map and select Test Parameter Options. If you do not see this test in the System Map, you might need to expand the collapsed groups, or your system may not include the device appropriate to this test. Refer to the *SunVTS User's Guide* for more details.

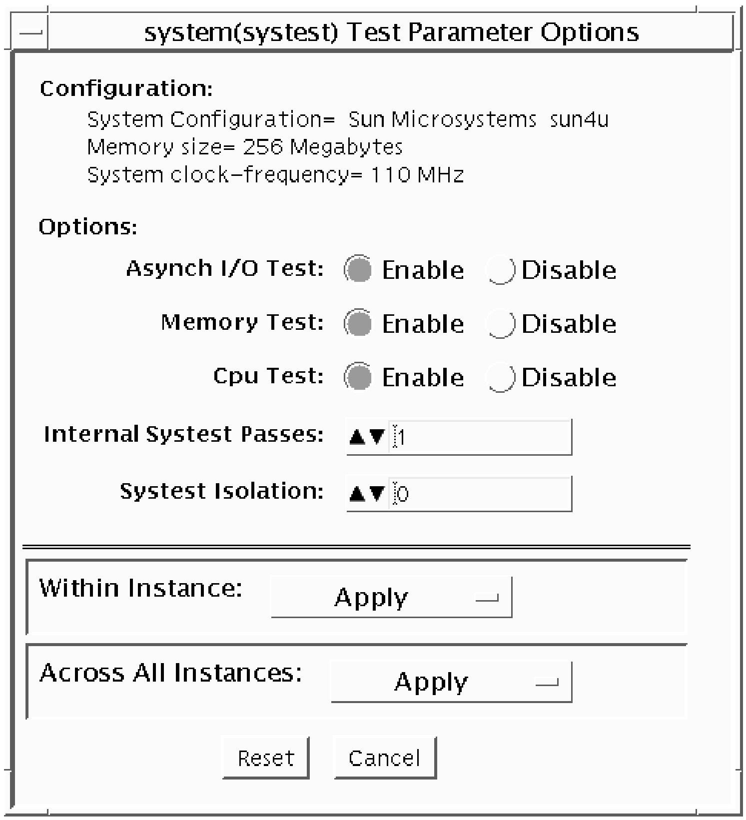


FIGURE 51-1 `systest` Test Parameter Options Dialog Box

Caution – Use discretion when defining the syspass parameter. One linpack pass (syspass=1) takes approximately 40 minutes on a server with 12 UltraSPARC™ III processors. If the syspass value is set to a high value, it also increases the probability of detecting residual errors.

Caution – Use strong discretion when defining the System Isolation (sysiso) parameter. BE AWARE THAT sysiso MAY ONLINE / OFFLINE CPUs IN THE SYSTEM. DO NOT USE sysiso ON PRODUCTION SERVERS. If you choose CPUs (sysiso=2) Isolation, the run time may be much higher than for board(s) (sysiso=1) Isolation. The total run time for Isolation can not be precisely estimated. If a residual error is found in the initial evaluation phase, the Isolation functionality will online / offline CPUs in order to detect the defective boards and CPUs in the system.

Note – Users are advised to not use the Processor Affinity option for this test. Doing so reduces the effectiveness of the test.

TABLE 51-1 `systest` Options

`systest` **Options**	**Description**
Asynch I/O Test	Enables or disables the Asynch I/O subtest. The default is enable.
Memory Test	Enables or disables the Memory subtest. The default is enable.
Cpu Test	Enables or disables the CPU/FPU subtests. The default is enable.
Internal System Passes	Defines the number of internal linpack passes. A set of boards and CPUs will be declared "GOOD" after "`syspass`" number of passes. The default is 1.
System Isolation	Defines the type of Isolation that `systest` needs to perform if a residual error is found in the initial evaluation phase. 0 = No Isolation (default) 1 = Board(s) Isolation only 2 = Board(s) and CPUs Isolation

The default values are recommended for an initial evaluation of the system.

`systest` Test Modes

TABLE 51-2 `systest` Supported Test Modes

Test Mode	Description
Exclusive	Performs only the `systest` (full test).

`systest` Command-Line Syntax

`/opt/SUNWvts/bin/systest` *standard_arguments* **`-o -io=`***Enable|Disable* **`-mem=`***Enable|Disable*, **`-cpu=`***Enable|Disable*, **`-dev=`**system, **`-syspass=`***1,2000*, **`-sysiso=`***0|1|2*

TABLE 51-3 `systest` Command Line Syntax

Argument	Description
`io=`*Enable|Disable*	Enables or disables the Asynch I/O subtest.
`mem=`*Enable|Disable*	Enables or disables the Memory subtest.
`cpu=`*Enable|Disable*	Enables or disables the CPU/FPU subtests. The CPU Test is not supported on x86 platforms.
`dev=`*system*	Specifies the pseudo device name.
`syspass=`*1,2000*	Defines the number of internal linpack passes. A set of boards and CPUs will be declared "GOOD" after "`syspass`" number of passes. The default is 1.
`sysiso=`*0|1|2*	Defines the type of Isolation that `systest` needs to perform if a residual error is found in the initial evaluation phase. 0 = No Isolation 1 = Board(s) Isolation only 2 = Board(s) and CPUs Isolation

---

Note – 64-bit tests are located in the `sparcv9` subdirectory: `/opt/SUNWvts/bin/sparcv9/`*testname*, or the relative path to which you installed SunVTS. If a test is not present in this directory, then it might be available as a 32-bit test only. For more information, see "32-Bit and 64-Bit Tests" on page 5.

Recommended Option Selection

The default values are recommended for an initial evaluation of the system.

Command-Line Examples

The following examples assume the user wants to execute `systest` from the command-line with verbose enabled.

Example 1:

```
# ./systest  -xv
```

The above example invokes the following:

- `systest` with default parameter values
- I/O, MEM, and CPU subtests. The CPU Test is not supported on x86 platforms.
- One internal pass of linpack and no Isolation

Example 2:

```
# ./systest  -xv -o io=Disable,mem=Enable,cpu=Enable,dev=system
```

The above example invokes the following:

- `systest` without the I/O subtest
- MEM and CPU subtests. The CPU Test is not supported on x86 platforms.
- One internal pass of linpack and no Isolation

Caution – Do not perform the following systest examples (3 and 4) on production servers because systest may online / offline CPUs.

Example 3:

```
# ./systest  -xv -o syspass=15,sysiso=1
```

The above example invokes the following:

- I/O, MEM, and CPU subtests. The CPU Test is not supported on x86 platforms.
- Declares a set of boards free from residual errors after 15 internal passes of the linpack algorithm
- If an error is found, `systest` will perform boards isolation

Example 4:

```
# ./systest  -xv -o syspass=10,sysiso=2
```

The above example invokes the following:

- I/O, MEM, and CPU subtests. The CPU Test is not supported on x86 platforms.
- Declares a set of boards AND CPUs free from residual errors after 10 internal passes of the linpack algorithm
- If an error is found, `systest` will perform boards AND CPUs isolation

CHAPTER 52

Tape Drive Test (tapetest)

The tapetest synchronous I/O test writes a pattern to a specified number of blocks (or, for a SCSI tape, writes to the end of the tape). The tapetest then rewinds the tape and reads and compares the data just written. The tapetest asynchronous I/O test sends a series of up to five asynchronous read/write requests to the tape drive, writing to the tape and then reading and comparing the data. The terms asynchronous and synchronous referred to here, and in the "method" field are not related to the scsi messaging terms of the same name. The tapetest file test writes four files to the tape and then reads them back, comparing the data. For tape library testing, the pass count is incremented only after all tapes in the library have been tested. The read/write algorithms fare enhanced for DLT tape by using a random data pattern (1.5:1 compression) and a more robust read compare algorithm. Some default parameters have also changed.

tapetest Test Requirements

If you have a tape drive in your system, load a blank writable tape (scratch tape) before you start SunVTS. If you fail to do this, the tapetest option may display drive type:unknown on the option menu for the tapetest.

tapetest Options

To reach the dialog box below, right-click on the test name in the System Map and select Test Parameter Options. If you do not see this test in the System Map, you might need to expand the collapsed groups, or your system may not include the device appropriate to this test. Refer to the *SunVTS User's Guide* for more details.

tapetest supports 4-mm, 8-mm, DLT, 1/4-inch cartridge, and 1/2-inch front-load tape drive testing. The options available for each of the tape devices differ slightly. An example of the Options dialog box for a device is shown in FIGURE 52-1.

The Async I/O subtest uses the asynchronous read and write feature of the Solaris tape driver to exercise tape drives. In read-only mode the test sends a maximum of four asynchronous read packets, each with a random size and a random offset, to the tape drive. The test then waits for all outstanding I/O activity to complete before issuing another round of packets. This process continues until the whole area being tested has been covered. In read-write mode, one write packet is issued for every four read packets to ensure a spot check of the write operation. The area of the tape to be tested is written to first in order for the test to work correctly. This test is only supported under the Solaris 2.6 and Solaris 7-9 operating environments and compatible releases.

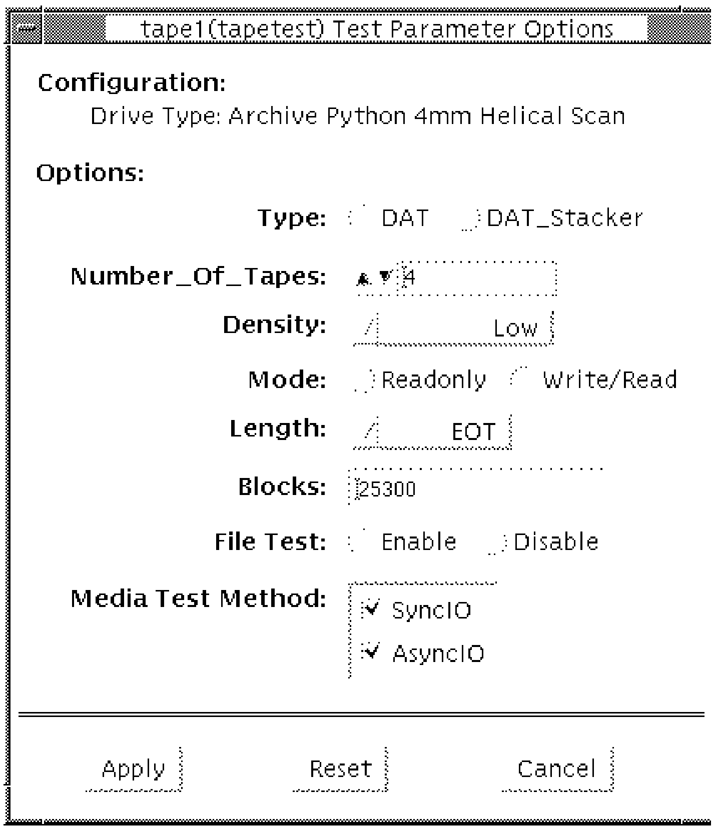


FIGURE 52-1 `tapetest` Test Parameter Options Dialog Box

Note – This test does not immediately stop after being disabled.

Note – Selecting non-default options can significantly increase the run time for the test.

Note – The Options dialog box for the 1/4-inch, 1/2-inch, DLT, and 8-mm tape drives differ slightly from FIGURE 52-1.

TABLE 52-1 `tapetest` Options

`tapetest` **Options**	**Description**
Type	Normal tape drive or tape library (stacker).
# of Tapes	The number of tapes in the tape library. `tapetest` registers a single tape library pass only after all tapes in the library pass.
Density	The following settings are available for most tape drives: • Low—Tests the `l` tape device. • Medium—Tests the `m` tape device. • Compression—Tests the `c` tape device. • All—Tests the `l`, `m`, and `c` tape devices. For half-inch tape drives, the available settings are 800, 1600, and 6250 BPI (blocks per inch). For certain QIC drives, select `QIC-11` (1-byte block ID) mode, `QIC-24` (4-byte block ID) mode, or `Both`. Note: On a DLT drive, the l and m settings both use no compression. tapetest does not support changing DLT capacity settings indicated on the front panel.
Mode	If you enable Write/Read mode, the test first writes to the tape and then reads it back to compare. If you enable Read_Only mode, the test assumes the tape has been properly written and merely reads and compares. This mode is useful to check proper head alignment. Note: If a read only pass is attempted and the tape was not previously written by tapetest, using the same test parameters currently set, a “Big Read Failure” will occur.

TABLE 52-1 `tapetest` Options

`tapetest` **Options**	**Description**
Length	The amount of the tape to be tested. The choices are: • `EOT`: The default; tests to the entire tape. • `Long`: The SCSI tape tests 70,000 blocks of the tape. • `Short`: Only the first 1000 blocks are tested. • `Specified`: You must type the number of blocks to be tested in the `# of blocks` field.
# of Blocks	If you select Specified under the Length option, you must type the number of blocks you want to test.
Blocksize	Block size specification. This option is only available for Tandberg QIC tape drives. There are two possible values. 512-bytes is for use with older tape media that have transfer size restrictions, while 64-kbytes is for use with current, high-capacity tape media. Note1: This option is only available in command line interface mode. Note2: With patches 110278-01 or 110211-01 applied, DLT writes either a 512 byte or 65536 byte block depending on how this parameter is set.
File Test	The tape file test sequence is as follows: 1. Writes three files. 2. Rewinds. 3. Reads part of the first file. 4. Forward spaces to the start of the second file. 5. Reads the second file. 6. Forward spaces to the start of the third file. 7. Tries to read to the end of that file for SCSI tapes only. The tape file test tries to backspace to the start of the second file and read it.
Retension	When enable is selected, the program retensions the tape.
Media Test Method	• Sync I/O—tapetest reads and or writes the number of blocks selected in Length. • Async I/O—tapetest makes four asynchronous read requests to the tape drive. If read and write testing is selected, one asynchronous write request is also sent. The test continues after completing the requests. Note – When testing Tandberg QIC drives, Async I/O testing is restricted to read-only due to asynchronous behavior differences with other tape drives. Note: This option is not associated with the synchronous data transfer request SCSI message. It is only synchronous or asynchronous in nature because the numbers of reads and writes are not synchronous to each other. The SDTR message is not invoked.

`tapetest` Test Modes

The `tapetest` supports the following test modes. It performs different test schemes on the tape device, according to the mode you select.

TABLE 52-2 `tapetest` Supported Test Modes

Test Mode	Description
Connection	`tapetest` verifies that the drive can be opened and that the drive type can be determined. If both checks are successful, or if the drive is currently busy, then the test passes. The `tapetest` fails if the open operation is unsuccessful for any reason other than the drive is busy.
Functional (Offline)	`tapetest` checks the status, rewinds the tape, erases and retensions it. If the device is a cartridge tape, `tapetest` writes a pattern to `nblks` or `eot` (default), rewinds the tape, and then reads and compares of the pattern. On the other hand, if the device is busy or if no tape cartridge can be found in the drive, the test cannot run and fails.

`tapetest` Command-Line Syntax

`/opt/SUNWvts/bin/tapetest` *standard_arguments* **`-o dev=`***device_name***`,`** **`s=`***block_count***`,d=`***density***`,m=`***mode***`,l=`***length***`,method=method,ft=`***enables*|*disables***`,`** **`ret=`***enables*|*disables***`,dat=`***dat_type***`,8mm=`***8mm_type***`,num=`***magazine_size***`,`** **`blocksize=`***block_size*

TABLE 52-3 `tapetest` Command-Line Syntax

Argument	Explanation
`dev=`*device_name*	Specifies the *device_name* of the tape drive (required).
`s=`*block_count*	Specifies the number of blocks to be tested.
`d=`*density*	Specifies the density of the tape to open.
`m=`*mode*	Enables either the Write_Read or Read_Only tests.
`l=`*length*	Specifies the length of the test (EOT, Specified, Long, or Short).

TABLE 52-3 `tapetest` Command-Line Syntax *(Continued)*

Argument	Explanation *(Continued)*
`method=`*method*	Specifies the media test method (SyncI/O and or AsyncI/O) used. Note: This option does not invoke the SCSI message “synchronous data transfer request. It is only asynchronous or synchronous in nature.
`ft`=*enables* | *disables*	Enables or disables the File test.
`ret`=*enables* | *disables*	Enable or disables tape retension.
`dat=`*dat_type*	If you are testing a digital audio tape drive, specify whether it is a regular DAT drive or a DAT stacker. The choices are `DAT` and `DAT_Stacker`.
`8mm=`*8mm_type*	If you are testing an 8-mm tape drive, specify whether it is a regular 8-mm tape drive or a tape library. The command line choices are `8mm` and `8mm_Library`.
`num=`*magazine_size*	If you are testing a tape library, specify the magazine size.
`blocksize=` *block_size*	This option is only available on a Tandberg QIC drive and DLT drives. Specify whether to use a 64 kbyte block transfer or a 512 byte block transfer. Use 512 bytes when testing older media in the drive. DLT supports 512 byte and 65536 byte modes

Note – 64-bit tests are located in the `sparcv9` subdirectory: `/opt/SUNWvts/bin/sparcv9/`*testname*, or the relative path to which you installed SunVTS. If a test is not present in this directory, then it might be available as a 32-bit test only. For more information, see “32-Bit and 64-Bit Tests” on page 5.

CHAPTER 53

USB Device Test (`usbtest`)

The `usbtest` verifies the proper functioning of the hardware of the USB subsystem. The test supports audio, keyboard and printer devices. The usbtest for audio verifies the proper functioning of the hardware and software components of the USB audio subsystem. Specifically, the test tests the USB audio devices: USB microphones and speakers.

Note – `usbtest` is a newly consolidated test which is used to test the USB ports using various USB devices such as the USB key board, the USB printer or the USB audio devices. `usbtest` supports the same set of options for both SPARC and x86.

For keyboard, the test verifies whether the keyboard(s) attached to the USB bus are USB compliant. The test will flash the LEDs of a compliant keyboard. The usbtest for printer verifies the proper functioning and integrity of the USB parallel port devices. The test data, either ASCII or a postscript file, is sent to the printer through the USB bulk transfer. The test saves and restores the printer settings.

The `usbtest` options and subtest available depends on the peripheral device attached to the USB port.

`usbtest` Subtests

Subtests for the USB audio device:

- Tone subtest

  The Tone subtest is only performed in the Connectivity test mode. This subtest is user-interactive in that the user must listen when the test is performed. This subtest generates two seconds of sound which is output to the speakers.

- Record/Play subtest

This subtest performs a simple check that records and plays one second of random data at 8kHz sampling. It simply reads random data from the USB microphone port and plays back to the USB speakers.

- Audio subtest

  This subtest plays a 30 second music file which is output to the speakers. This is a partially user-interactive test. If there are no system call errors, the user must decide, by listening, if the test passed or failed. Things to listen for are distortion or lack of music.

Subtests for the USB printer device:

- getdevid subtest

  The getdevid subtest retrieves the IEEE 1284 ID string of the printer.

- Printer subtest

  The Printer subtest prints strings of ASCII characters (from 0x32 to 0x7e), and can also print the postscript file `usbppdata.ps` to the printer.

`usbtest` Options

To reach the dialog box below, right-click on the test name in the System Map and select Test Parameter Options. If you do not see this test in the System Map, you might need to expand the collapsed groups, or your system may not include the device appropriate to this test. Refer to the *SunVTS User's Guide* for more details.

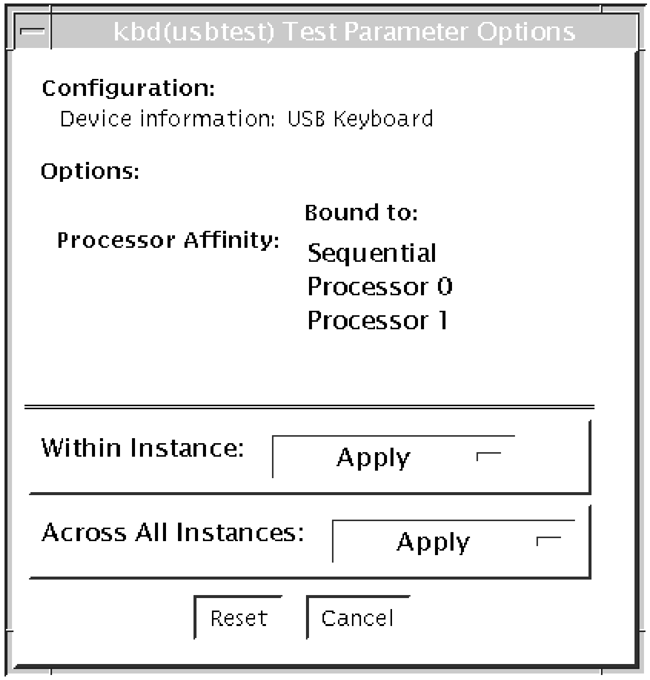


FIGURE 53-1 `usbtest` Test Parameter Options Dialog Box

TABLE 53-1 `usbtest` Opions

Option	Description
Options available for USB audio devices:	
Volume	Specifies the volume of 0 to 255; the default is 80
Audiotest	Can be set to "enable" or "disable" to perform the audio music test; the default is "enable"
Option available for USB printer devices	
DeviceID	Specifies the path to the printer
Printer	Enables or Disables the Printer subtest; this test requires a printer to be attached to the USB port
Printer_data_type	Specifies the test data: ascii, postscript, or both
Printer_delay_seconds	Specifies in seconds, the delay after the Printer subtest is performed

`usbtest` Test Modes

This test supports Connection and Functional test modes.

TABLE 53-2 `usbtest` Supported Test Modes

Test Mode	Description
Connection	For a USB audio device, the test outputs two seconds of sound to the speakers For USB keyboard device, the test runs the full test. For USB printer device, the test runs only the getdevid subtest.
Functional	For a USB audio device, the test performs Records and Plays subtest by default. The user can enable Audio Music test For USB keyboard device, the test runs the full test For USB printer device, the getdevid subtest is enabled by default and the Printer subtest is disabled by default

`usbtest` Command Line Syntax

`/opt/SUNWvts/bin/sparcv9/usbtest -cvf -o dev`=*dev-name*, `getdevid`=*Enable*|*Disable*, `printer`=*Enable*|*Disable*, `data`=*ascii*, `postscript`, `delay`=*0-86400*, `M`=*Enable*|*Disable*, `O`=*speaker*|*headphone*|*line-out*, `V`=*0-255*, `MF`=*musicfilename*

TABLE 53-3 `usbtest` Command Line Syntax

Argument	Description
`dev`=*dev-name*	The target device name. The test runs on the specified device name. The default device name is `/dev/kbd`.
Options for the USB printer	
`getdevid`=*Enable*|*Disable*	The option is available only for USB printer device. Enables or disables getdevid subtest. The subtest is enabled by default.
`printer`=*Enable*|*Disable*	Enables or disables the printer test. The subtest is disabled by default. The subtest requires a printer to be attached to the USB port.

TABLE 53-3 `usbtest` Command Line Syntax *(Continued)*

Argument	Description
`data`=*ascii*	Choose whether ASCII text or Postscript data is sent to the printer.
`delay`=*0-86400*	Allows you to choose a delay between passes of the printer test.
Options for the USB audio device	
`M`=*Enable* | *Disable*	Enables or disables the music play test. The default is enable.
`O`=*speaker* | *headphone* | *line-out*	Selects the output device the test needs to use.
`V`=*0-255*	Music output volume; the default is 80.
`MF`=*musicfilename*	Selects the music file; the default is `music.au`.

CHAPTER **54**

Virtual Memory Test (`vmemtest`)

The `vmemtest` checks virtual memory; that is, it tests the combination of physical memory and the swap partitions of the disk(s).

Note – This test may not stop immediately after being disabled.

Note – `vmemtest` supports the same set of options for both SPARC and x86 platforms.

This test uses the Solaris `valloc` (page aligned) system call to allocate, write, read, and compare virtual memory. These operations normally cause heavy paging activity on the system and simulate a stressful environment for the operating system. This test also detects ECC parity errors, memory read errors, and addressing problems, and displays the corresponding virtual memory addresses on failure.

Note – Do not run the `vmemtest` with `fwcamtest` at the same time on any Sun Blade™ system. This will cause the test to fail.

`vmemtest` Swap Space Requirements

Running this test places a significant burden on the operating system, since it uses the majority of swap space available for testing. You should use the `vmemtest` swap space `reserve` option when non-SunVTS test processes are started after SunVTS testing has started. See “Swap Space Requirements” in the *SunVTS User's Guide* for a complete discussion of swap space requirements.

`vmemtest` Options

To reach the dialog box below, right-click on the test name in the System Map and select Test Parameter Options. If you do not see this test in the System Map, you might need to expand the collapsed groups, or your system may not include the device appropriate to this test. Refer to the *SunVTS User's Guide* for more details.

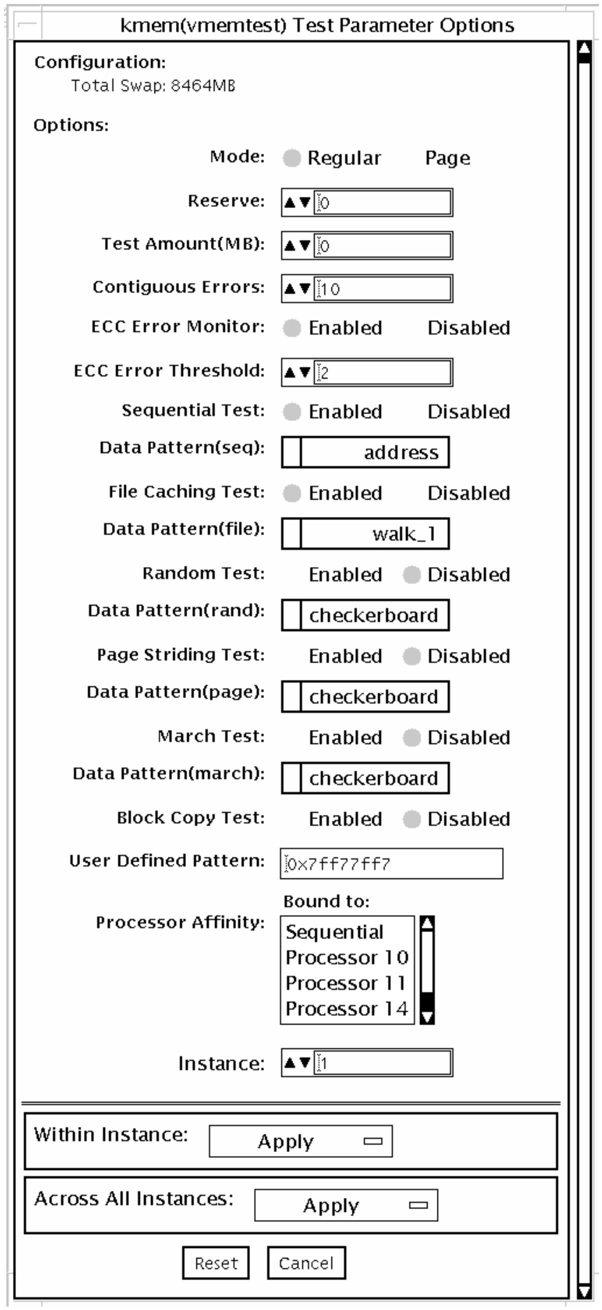


FIGURE 54-1 `vmemtest` Test Parameter Options Dialog Box

TABLE 54-1 `vmemtest` Options

vmemtest Options	Description
Mode	Two modes are available: • Regular mode tests the specified amount of memory as one chunk and passed as the size arugment to the different test algorithm functions (subtests). • Page mode tests assign virtual memory one page at a time. Each page is mapped to the temporary file /tmp/vmem.page and is then paged out to storage once test data is written. Next, the temporary page is paged back into memory for a read and compare. vmemtest runs in Regular mode as default setting
Reserve	The Reserve option specifies the amount of memory to reserve from being tested by vmemtest. The test ensures this amount of memory is left free on the system while evaluating the size of memory for testing. If specified value of reserve is Zero, test will use a default value evaluated based on the available free swap space for the instance. Trying to reserve more memory than available free memory by this instance will cause the test to fail.
Test Amount	An amount can be specified to test the virtual memory, instead of the default.The default value is 0, which means the default memory size is evaluated within the test. It is desirable to the user to know the memory configuration details on the target system while choosing Non default setting for "amount" option. If negetive values are specified, test will assume default setting while it runs. The actual size of memory tested by the instance is always evaluated with reference to the available free swap space on the system.
`vmemtest` Configuration	The amount of memory listed in the Configuration field is equivalent to the sum of the used and available swap space amounts returned by the swap -s command. It indicates the amount of virtual memory found, rounded up to the nearest Kbyte.
Contiguous Errors	Specifies the max. number of contiguous memory errors, which will be considered and counted as one non contiguous error. The default value is 10.
ECC Error monitoring	Enables or disables ECC error monitoring.
ECC Error threshold	Determines how many correctable ECC errors occurred in the elapsed time before vmemtest reports a test failure. The default threshold value is 2.

TABLE 54-1 `vmemtest` Options *(Continued)*

vmemtest Options	Description
Test Method	`vmemtest` runs the Sequential and File Caching subtests by default. Sequential subtest – The whole memory is tested from the beginning address to the end address in a sequence. Address Random subtest – Randomly selects memory addresses with in the specified range to test. Page Striding subtest – Non-contiguous memory test, implemented sequentially and non-sequentially. Sequential striding – Tests from the first page to the last page, withn a specified test range. Only one word is tested per page. Non-sequential striding – Tests randomly from first to last page, within a specified memory range. Goes back and forth testing one word per page until all pages are tested. Block Copy test – Writes and reads data between two memory blocks. Each memory block is half the memory to be tested. File Caching test – Aimed at improving performance through the use of file caching in the Solaris kernel. This test is useful for large memory configurations. This test takes 30 to 70% less time than the Sequential test method.
Predefined Pattern	• Select one of the following patterns to use for the test: • Address--uses the virtual addresses of the tested memory locations. • walk_1--uses a pattern that starts with 0x80000000 through 0x11111111 • walk_0--uses a pattern that starts with 0x7fffffff through 0x00000000 • 0x00000000--uses all ones and zeros for testing • 0x5aa55aa5--uses 0x5aa55aa5 pattern • 0xdb6db6db--uses 0xdb6db6db pattern • Checkerboard--uses 0xaaaaaaaa patterns. • UserDefined--uses the pattern that is specified in the User Defined Pattern area (see below).
User Defined Pattern	Only used if the Predefined Pattern is set to UserDefined. The pattern specified should be in the form of an 8-digit, hexadecimal number such as 0x2a341234. Default setting is up= 0x7ff77ff7
Instance	Specifies how many copies of the vmemtest test to run.

`vmemtest` Test Modes

TABLE 54-2 `vmemtest` Supported Test Modes

Test Mode	Description
Functional	Runs the full set of tests.

In Functional test mode, `vmemtest` writes a pattern to an amount of virtual memory specified by the user. Then the data is read back and compared. If there is a miscompare, the data is read again and compared. Whenever there is a miscompare, the virtual address is reported.

`vmemtest` Command-Line Syntax

`/opt/SUNWvts/bin/vmemtest` *standard_arguments* **`-o mode=`***type*, **`reserve=`** *n*, **`amount=`***n*, **`cerr=`***n*, **`eccmon=`***Enabled* | *Disabled*, **`eccthreshold=`***n*, **`type1=`** *Enable* | *Disable*, **`pp1=`***pattern*, **`type2=`***Enable* | *Disable*, **`pp2=`***pattern*, **`type3=`***n*, **`pp3=`** *pattern*, **`type4=`***Enable* | *Disable*, **`pp4=`***pattern*, **`type5=`***Enable* | *Disable*, **`pp5=`***pattern*, **`type6=`***Enable* | *Disable*, **`up=`***hex_pattern*

TABLE 54-3 `vmemtest` Command-Line Syntax

Argument	Explanation
`mode=`*Page* | *Regular*	Specifies which mode of the `vmemtest` to run. Choose: • `Page`—tells the write/read memory test to proceed one system memory page at a time. • `Regular`—uses the `valloc` option to allocate the entire assigned memory, which is read and compared one long word at a time.
`reserve`=*n*	Specifies the amount of MB of virtual memory to reserve.
`amount=`*n*	Specifies the number of MB of memory to be tested instead of the default.
`cerr=`*n*	Specifies the maximum number of contiguous errors to be counted as one non contiguous error.
`eccmon=`*Enabled* | *Disabled*	Enables or disables the ECC error monitor.
`eccthreshold=`*n*	Specifies how many correctable ECC errors can occur in the elapsed time before `vmemtest` reports a test failure.

TABLE 54-3 `vmemtest` Command-Line Syntax

Argument	*(Continued)* Explanation
type1=*value* **pp1=***pattern*	`type1` is sequential test. The value is Enabled or Disabled; the default is Enabled. The default for the `pp1` pattern is `address`; select the `pp1` pattern from: **address**,**walk_0**,**walk_1**,**Checkerboard**, **0x00000000**,**0xffffffff**,**0x5aa55aa5**, **0xdb6db6db**,**random**,*UserDefined*
type2=*value* **pp1=***pattern*	`type2` is File cache test. The value is Enabled or Disabled; the default is Enabled. The default for the `pp1` pattern is `address`; select the `pp1` pattern from: **address**,**walk_0**,**walk_1**,**Checkerboard**, **0x00000000**,**0xffffffff**,**0x5aa55aa5**,**0xdb6db6db**, **random**,*UserDefined*
type3=*value* **pp3=***pattern*	`type3` is Random address test. The value is Enabled or Disabled; the default is Disabled. The default of the `pp3` pattern is `checkerboard`; select the `pp3` pattern from: **Checkerboard**,**0x00000000**,**0xffffffff**, **0x5aa55aa5**,**0xdb6db6db**,*UserDefined*
type4=*value* **pp4=***pattern*	`type4` is `page_striding` test. The value is Enabled or Disabled; the default is Disabled. The default of the `pp4` pattern is `checkerboard`; select the `pp4` pattern from: **Checkerboard**,**0x00000000**,**0xffffffff**, **0x5aa55aa5**,**0xdb6db6db**,*UserDefined*
type5=*value* **pp5=***pattern*	`type5` is `march_c` test. The value is Enabled or Disabled; the default is Disabled. The default for the `pp5` pattern is `checkerboard`; select the `pp5` pattern from: **Checkerboard**,**0x00000000**,**0xffffffff**, **0x5aa55aa5**,**0xdb6db6db**,*UserDefined*
type6=*value*	`type6` is `Block_Copy` test. The value is Enabled or Disabled; the default is Disabled. Note – The `Block_Copy` subtest uses its own set of the data patterns predefined in the test. It does not require any user specified data patterns for testing.
up=*hex_address*	Only used if the `pp` argument is set to `UserDefined`. The pattern specified should be in the form of a 8-digit, hexadecimal number such as `0x2a341234`.

Note – 64-bit tests are located in the `sparcv9` subdirectory: `/opt/SUNWvts/bin/sparcv9/`*testname*, or the relative path to which you installed SunVTS. If a test is not present in this directory, then it might be available as a 32-bit test only. For more information, see "32-Bit and 64-Bit Tests" on page 5.

APPENDIX **A**

Loopback Connectors

Loopback connectors are designed for the testing of communication ports. They take the form of either a single plug or a port-to-port cable with some communication connections shorted (looped-back).

Note – Loopback connectors must be wired properly and connected firmly for the Serial Port tests to work correctly. Miswired, poorly soldered, or missing loopback connectors can cause erroneous diagnostic error messages.

The following table depicts the pin assignments for most loopback plugs and cables that may be used when testing a system.

TABLE A-1 Loopback Connector Pin Assignments

Signal Description	EIA	CCITT #	RS-449 "A"	RS-449 "B"	DIN 8 8-pin round	DB9 9-pin	DB25 25-pin	Direction	Alpha ID
Chassis/Frame Ground	AA	101	1	NC*	NC*	NC*	1	None	AA
Transmit Data (TxDa)	BA	103	4	22	3	3	2	Output	BA
Receive Data (RxDa)	BB	104	6	24	5	2	3	Input	BB
Request To Send (RTSa)	CA	105	7	25	6	7	4	Output	CA
Clear To Send (CTSa)	CB	106	9	27	2	8	5	Input	CB
Data Set Ready (DSRa)	CC	107	11	29	NC*	6	6	Input/output	CC

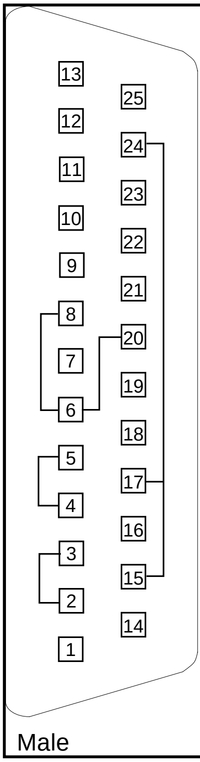
TABLE A-1 Loopback Connector Pin Assignments *(Continued)*

Signal Description	EIA	CCITT #	RS-449 "A"	RS-449 "B"	DIN 8 8-pin round	DB9 9-pin	DB25 25-pin	Direction	Alpha ID
Signal Ground (SG)	AB	102	19	NC*	4	5	7	None	AB
Data Carrier Detect (DCDa)	CF	109	13	31	7	1	8	Input	CF
Transmit Clock In (TRxCa)	DB	114	5	23	NC*	NC*	15	Input	DB
Receive Clock In (RTxCa)	DD	115	8	26	8	NC*	17	Input	DD
Data Terminal Ready (DTRa)	CD	108	12	30	1	4	20	Output	CD
External Clock Out (TRxCa)	DA	113	17	35	NC*	NC*	24	Output	DA
Secondary Data Carrier Detect (DCDb)	SC F	122	NC*	NC*	NC*	NC*	12	Input	SCF
Secondary Clear to Send (CTSb)	SC B	121	NC*	NC*	NC*	NC*	13	Input	SCB
Secondary Transmit Data (TxDb)	SB A	118	NC*	NC*	NC*	NC*	14	Output	SBA
Secondary Receive Data (RxDb)	SB B	119	NC*	NC*	NC*	NC*	16	Input	SBB
Secondary Request to Send (RTSb)	SC A	120	NC*	NC*	NC*	NC*	19	Output	SCA

*NC = No connection

25-Pin RS-232 Loopback Plug

The RS-232 and RS-423 single-port loopback plug is a specially wired male DB-25 connector. It is plugged in to a serial port in the back of the system under test.



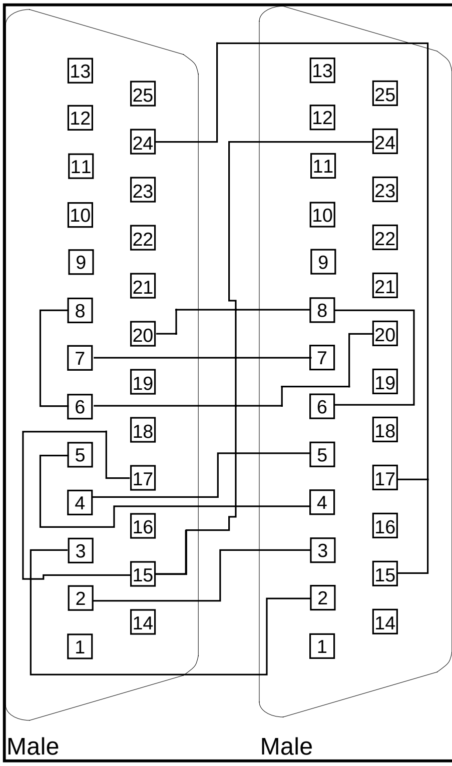
Connect:

First connector	to	Second connector
Pin 3		Pin 2
Pins 6 and 8		Pin 20
Pins 15 and 17		Pin 24

FIGURE A-1 25-pin RS-232 Loopback Plug Wiring Diagram

25-Pin RS-232 Port-to-Port Loopback Cable

Use these wiring instructions for 25-pin RS-232 and RS-423 port to 25-pin RS 232 and RS 423 port loopback cables (two DB-25 connections). It is plugged into a pair of serial ports in the back of the system under test. Both connectors are male.



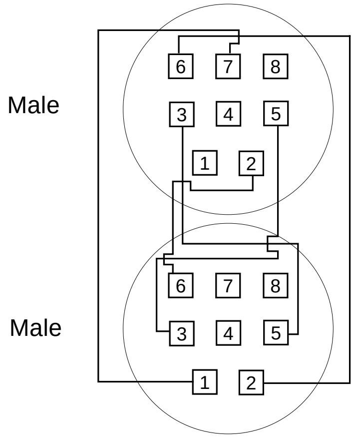
Connect:

First connector	to	Second connector
Pin 2		Pin 3
Pin 3		Pin 2
Pin 4		Pin 5
Pin 5		Pin 4
Pins 6 and 8		Pin 20
Pin 7		Pin 7
Pins 15 and 17		Pin 24
Pin 20		Pins 6 and 8
Pin 24		Pins 15 and 17

FIGURE A-2 25-pin RS-232 Port-to-Port Loopback Cable Wiring Diagram

8-Pin to 8-Pin Loopback Cable

Use these wiring directions for 8-pin round DIN RS-232 port to RS-423 to 8-pin round-DIN RS-232 and RS-423 port loopback cable. Both connectors are male.



Connect:

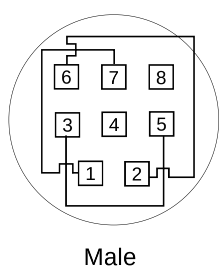
First connector	to	Second connector
Pin 3		Pin 5
Pin 5		Pin 3
Pin 6		Pin 2
Pin 2		Pin 6
Pin 7		Pin 1

FIGURE A-3 8-Pin to 8-Pin Loopback Cable Wiring Diagram

Pin 8, Receive clock In (DD), remains unconnected.

8-Pin Loopback Plug

Use these wiring directions for male 8-pin round-DIN RS-232 and RS-423 single-port loopback plugs.



Connect:

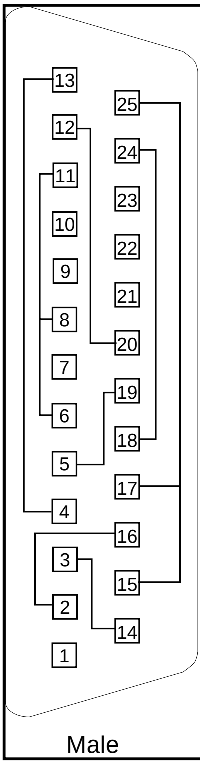
First connector	to	Second connector
Pin 3		Pin 5
Pin 6		Pin 2
Pin 1		Pin 7

FIGURE A-4 8-Pin Loopback Plug Wiring Diagram

Pin 8, Receive Clock In (DD), remains unconnected.

25-Pin Port A-to-Port B Loopback Plug

Use these wiring directions for a 25-pin Port A to Port B loopback plug for most systems.



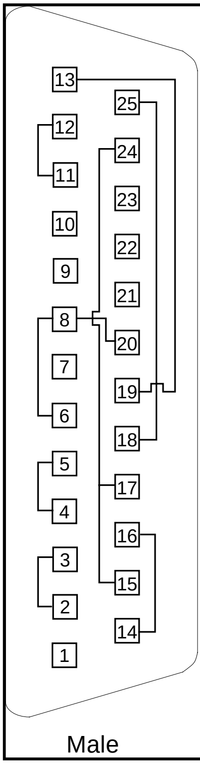
Connect:

First connector	to	Second connector
Pin 16		Pin 2
Pin 3		Pin 14
Pin 13		Pin 4
Pin 5		Pin 19
Pins 6 and 8		Pin 11
Pin 12		Pin 20
Pin 18		Pin 24
Pins 15 and 17		Pin 25

FIGURE A-5 Port A-to-Port B Loopback Plug Wiring Diagram

25-Pin Port A-to-A Port B-to-B Loopback Plug

If your system has a single communication port to connect it to peripherals, use these wiring instructions for making a male 25-pin loopback plug for that communication port.



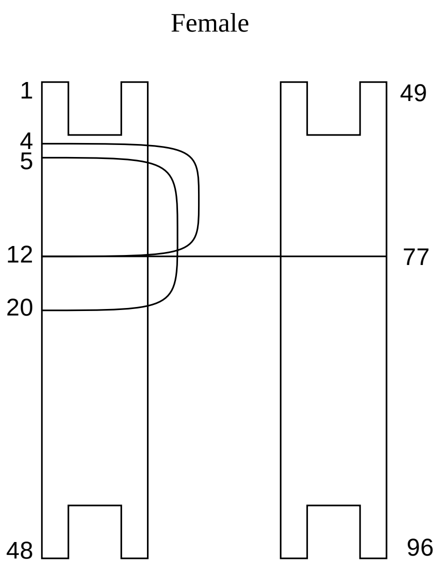
Connect:

First connector	to	Second connector
Pin 3		Pin 2
Pin 5		Pin 4
Pins 6 and 8		Pin 20
Pin 12		Pin 11
Pin 13		Pin 19
Pin 16		Pin 14
Pins 15 and 17		Pin 24
Pin 25		Pin 18

FIGURE A-6 Port A-to-A, Port B-to-B Loopback Plug Wiring Diagram

96-Pin Female Loopback Connector

This 96-pin connector can be ordered from Sun (part number 370-1366).



Materials:
PCR-E96FA(1)
PCS-E96LKPA(1)
3751 Metal Plug(1)
(9563K42)
AWG28 Madison Cable(8” long)
UL/CSA Approved

Connect:

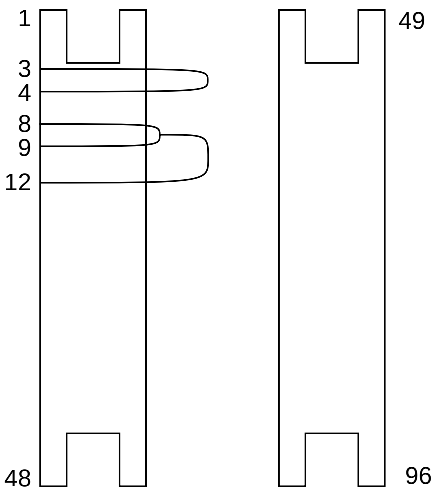
First connector	to	Second connector
Pins 4 and 12		Pin 77
Pin 5		Pin 20
Pins 6		Pin 36
Pin 10		Pin 11
Pins 13		Pin 16
Pin 14		Pin 15
Pin 18		Pin 19
Pin 21		Pin 24
Pin 28		Pin 60
Pin 29		Pin 68
Pin 30		Pin 34
Pin 37		Pin 40
Pin 38		Pin 39
Pin 42		Pin 43
Pin 45		Pin 48
Pin 46		Pin 47
Pin 52		Pin 78
Pin 53		Pin 55
Pin 54		Pin 75
Pin 58		Pin 59
Pin 61		Pin 64
Pin 62		Pin 63
Pin 66		Pin 67
Pin 69		Pin 72
Pin 76		Pin 79
Pin 82		Pin 83
Pin 85		Pin 88
Pin 86		Pin 87
Pin 90		Pin 91
Pin 93		Pin 96
Pin 94		Pin 95

FIGURE A-7 96-Pin Female Loopback Connector Wiring Diagram

96-Pin Female Special Loopback Connector

This 96-pin connector can be ordered from Sun (part number 370-1381).

Female Special



Materials:
PCR-E96FA(1)
PCS-E96LKPA(1)
9563K999 Cap(1)
Madison Cable(6" long)
(#28 SCSI UL/CSA Approved)

Open Contacts:
1, 2, 6,16, 23, 24, 25, 26, 30, 40, 47, 48, 49, 50, 54, 64, 71, 72, 73, 74, 78, 88, 95, 96

Connect:

First Connector	to	Second Connector
pin 3		pin 4
pin 5		pin 7
pins 8 and 9		pin 12
pin 10		pin 11
pin13		pin 14
pin 15		pin 17
pins 18 and 19		pin 22
pin 20		pin21
pin 27		pin 28
pin 29		pin 31
pins 32 and 33		pin 36
pin 34		pin 35
pin 37		pin 38
pin 39		pin 41
pins 42 and 43		pin 46
pin 44		pin 45
pin 51		pin 52
pin 53		pin 55
pins 56 and 57		pin 60
pin 58		pin 59
pin 61		pin 62
pin 63		pin 65
pins 66 and 67		pin 70
pin 68		pin 69
pin 75		pin 76
pin 77		pin 79
pins 80 and 81		pin 84
pin 82		pin 83
pin 85		pin 86
pin 87		pin 89
pins 90 and 91		pin 94
pin 92		pin 93

FIGURE A-8 96-Pin Female Special Loopback Connector Wiring Diagram

37-Pin RS-449 Loopback Cable

Use these wiring instructions for a loopback cable for two 37-pin RS-449 synchronous ports.

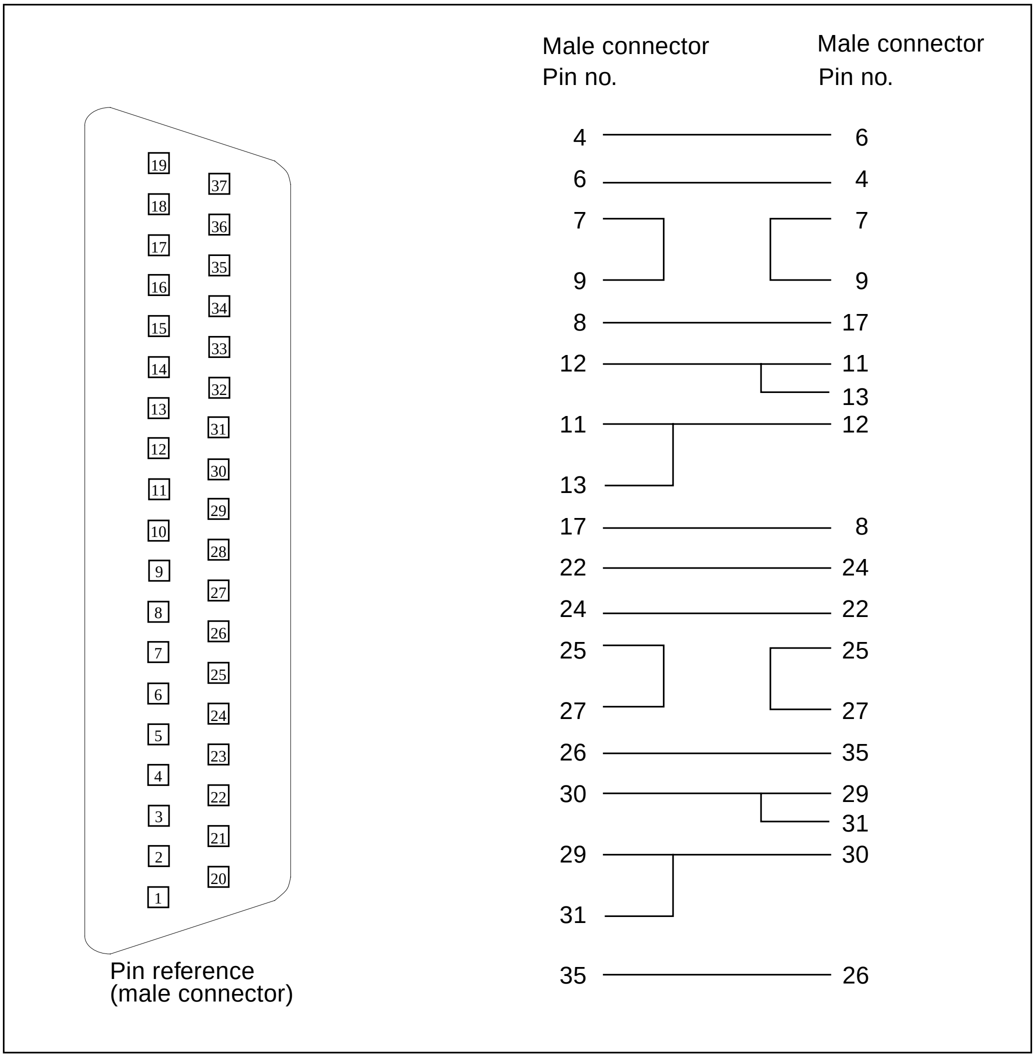


FIGURE A-9 37-Pin RS-449 Loopback Cable Wiring Diagram

37-Pin RS-449 Loopback Plug

Use these wiring instructions for making a male 37-pin RS-449 loopback plug. This connector is also available from Sun (part number 530-1430).

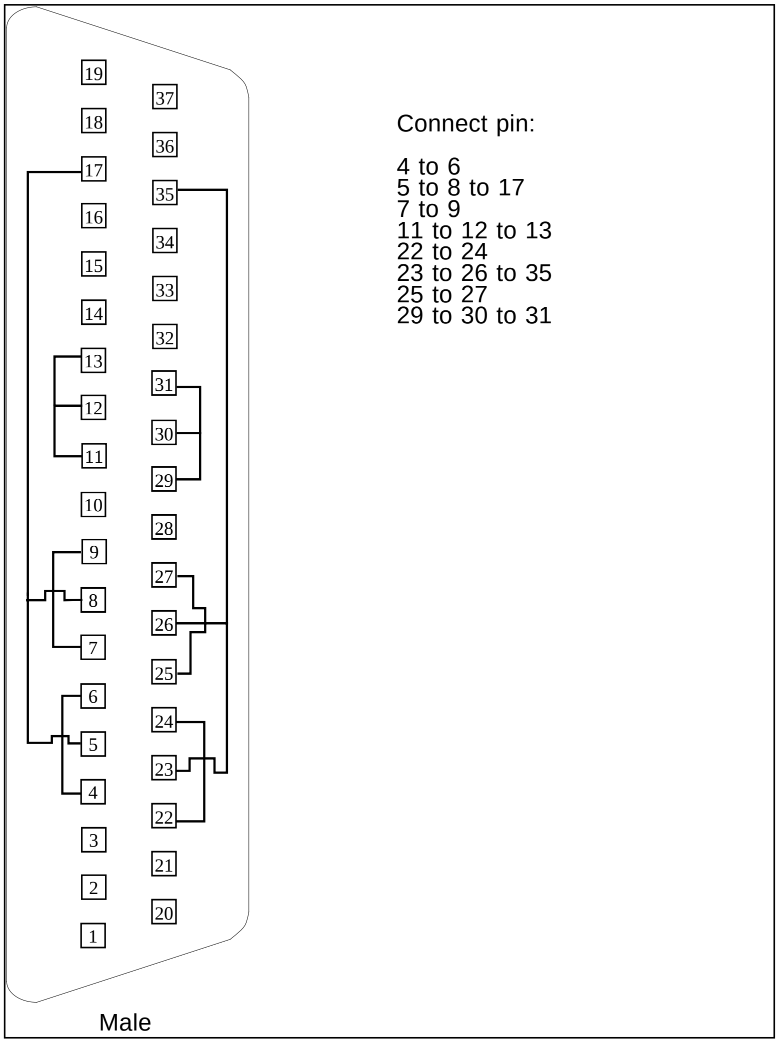
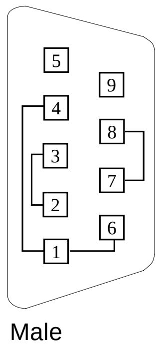


FIGURE A-10 37-Pin RS-449 Loopback Plug Wiring Diagram

9-Pin Male Single-Port Loopback Plug

Use these wiring instructions for male 9-pin RS-232 and RS-423 single-port loopback plugs.



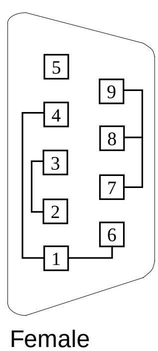
Connect:

First connector	to	Second connector
Pin 2		Pin 3
Pin 1		Pins 4 and 6
Pin 7		Pin 8

FIGURE A-11 9-Pin Male Single-Port Loopback Plug Wiring Diagram

9-Pin Female Single-Port Loopback Plug

Use these wiring directions for female 9-pin RS-232 and RS-423 single-port loopback plugs. Use this loopback plug with the `pcmciatest`.



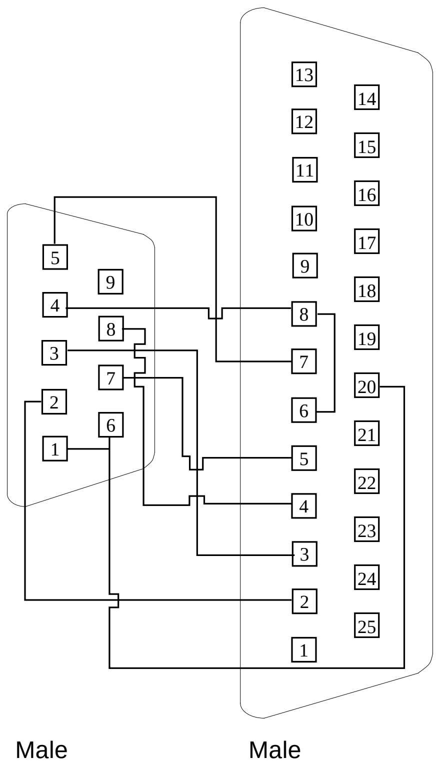
Connect:

First connector	to	Second connector
Pin 2		Pin 3
Pin 1		Pins 4 and 6
Pin 7		Pins 8 and 9

FIGURE A-12 9-Pin Female Single-Port Loopback Plug Wiring Diagram

9-Pin to 25-Pin Port-to-Port Loopback Cable

Use these wiring instructions for a 9-pin RS-232 and RS-423 port to 25-pin RS-232 and RS 423 port loopback cables. Both connectors are male.



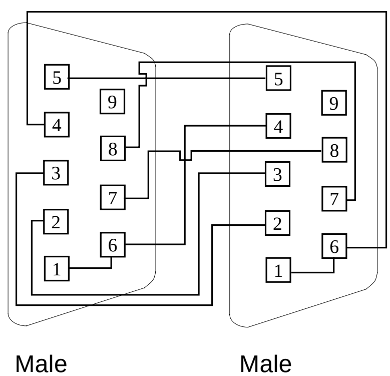
Connect:

First connector	to	Second connector
Pin 2		Pin 2
Pin 3		Pin 3
Pin 8		Pin 4
Pin 7		Pin 5
Pin 5		Pin 7
Pin 4		Pins 6 and 8
Pins 1 and 6		Pin 20

FIGURE A-13 9-Pin to 25-Pin Port-to-Port Loopback Cable Wiring Diagram

9-Pin to 9-Pin Port-to-Port Loopback Cable

Use these wiring instructions for 9-pin RS-232 and RS 423 port to 9-pin RS-232 and RS-423 port loopback cables. Both connectors are male.



Connect:

First connector	to	Second connector
Pins 1 and 6		Pin 4
Pin 2		Pin 3
Pin 3		Pin 2
Pin 4		Pins 1 and 6
Pin 5		Pin 5
Pin 7		Pin 8
Pin 8		Pin 7

FIGURE A-14 9-Pin to 9-Pin Port-to-Port Loopback Cable Wiring Diagram

Please note that this cable has no Sun part number assigned to it.

NT to TE Loopback Cable

Using two standard RJ-45 connectors, and connect pin 1 to pin 1, pin 2 to pin 2, and so on, for all pins. This loopback is a "straight-through" connection.

Twisted-Pair Ethernet (TPE) Loopback Cable for Fast Ethernet

Use the following wiring instructions for standard RJ-45 connectors for Fast Ethernet. This loopback cable is used in `netlbtest` for `eri` devices.

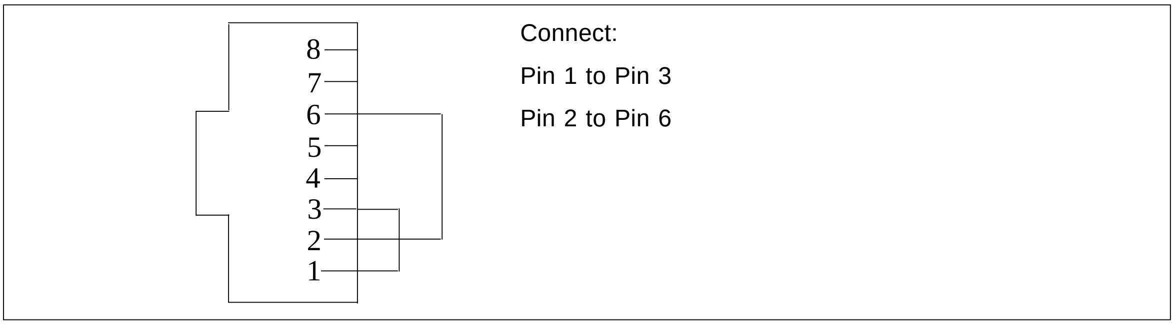
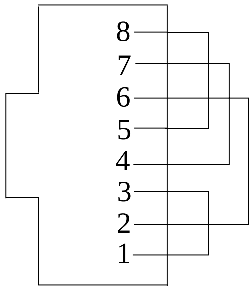


FIGURE A-15 Twisted-Pair Ethernet (TPE) Loopback Cable Wiring Diagram for Fast Ethernet

TPE Loopback Cable for Gigabit and 10/100 Ethernet

Use the following wiring instructions for RJ-45 connectors for Gigabit and 10/100 Ethernet. This loopback cable is used in `netlbtest` for Gigabit and 10/100 devices.



Connect:

Pin1 to Pin 3

Pin 2 to Pin 6

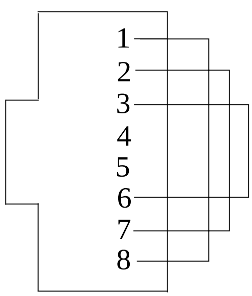
Pin 4 to Pin 7

Pin 5 to Pin 8

FIGURE A-16 TPE Loopback Cable Wiring Diagram for Gigabit and 10/100 Ethernet

x86 Platform RJ-45 Serial Port Loopback Connector

Use the following wiring instructions for x86 platform RJ-45 serial port loopback connectors.



Connect:

Pin 1 to Pin 8

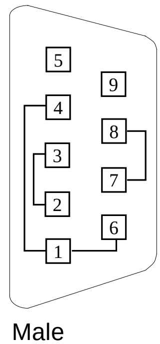
Pin 2 to Pin 7

Pin 3 to Pin 6

FIGURE A-17 x86 Platform RJ-45 Serial Port Loopback Connector

9-Pin Male Single-Port Loopback Plug

Use these wiring instructions for male 9-pin RS-232 and RS-423 single-port loopback plugs.



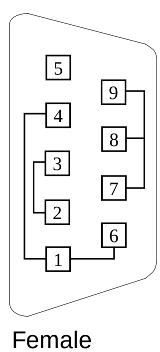
Connect:

First connector	to	Second connector
Pin 2		Pin 3
Pin 1		Pins 4 and 6
Pin 7		Pin 8

FIGURE A-18 9-Pin Male Single-Port Loopback Plug Wiring Diagram

9-Pin Female Single-Port Loopback Plug

Use these wiring directions for female 9-pin RS-232 and RS-423 single-port loopback plugs. Use this loopback plug with the `pcmciatest`.



Connect:

First connector	to	Second connector
Pin 2		Pin 3
Pin 1		Pins 4 and 6
Pin 7		Pins 8 and 9

FIGURE A-19 9-Pin Female Single-Port Loopback Plug Wiring Diagram

9-Pin Male DB-9 External Loopback Connector

Use these wiring instructions for male 9-pin DB-9 external loopback connectors.

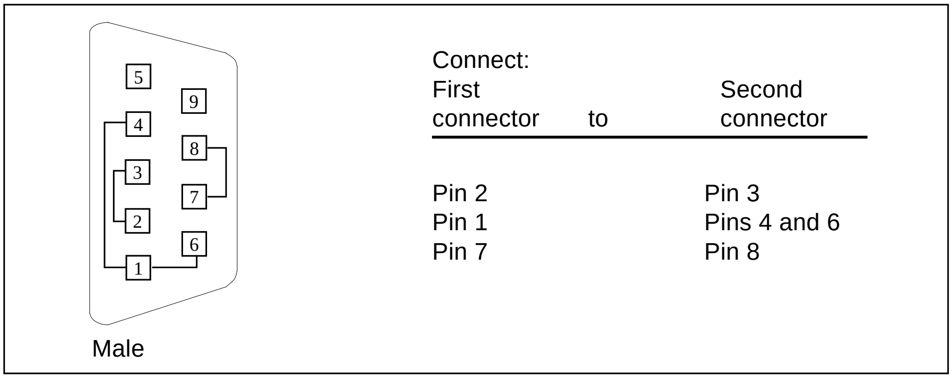


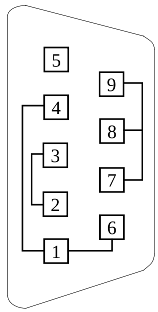
FIGURE A-20 9-Pin Male DB-9 External Loopback Connector Wiring Diagram

The signals and names for the DB-9 connector are as follows.

Pin	Name	Signal
1	DCD	Data Carrier Detect
2	RxD	Receive Data
3	TxD	Transmit Data
4	DTR	Data Terminal Ready
5	SGND	Signal Ground
6	DSR	Data Set Ready
7	RTS	Request To Send
8	CTS	Clear To Send
9	RI	Ring Indicator

9-Pin Female DB-9 External Loopback Connector

Use these wiring instructions for female 9-pin DB-9 external loopback connectors. Use this loopback connector with the `test` on x86 platforms.



Female

Connect:

First connector	to	Second connector
Pin 2		Pin 3
Pin 1		Pins 4 and 6
Pin 7		Pins 8 and 9

FIGURE A-21 9-Pin Female DB-9 External Loopback Connector Wiring Diagram

Glossary

administrative domain An arbitrary collection of hosts and networks that are monitored by the software as a single hierarchal entity. You may choose to divide their enterprise into several domains, each to be managed by different users.

agent A software process, usually corresponding to a particular local managed host, that carries out manager requests and makes local system and application information available to remote users.

bus A point-to-point network component. Used by the software to represent a network link to which many other hosts may be connected.

community A string similar to a password that is used to authenticate access to an agent's monitored data.

COMA Cache Only Memory Architecture. In a COMA machine, additional hardware including tag and state memory is added to the DRAM of each processing node to convert it into a kind of cache called attraction memory. See also NUMA.

CTQ Critical to Quality. A SunSigma terminology, used to identify key issues for a product based on voice of the customer.

diagnosis Correct interpretation and reporting of error.

diagnosability Ability of system to detect and correctly report errors when they occur.

diagnostics A test to uncover faults. These tests are used in design and validation to find margins and set limits on error protection, and stress tests used in operations to screen finished product for escapes.

diagnostic harness The harness or environment that schedules, manages and control execution of diagnostic tests on a platform.

DRAM Dynamic Read Access Memory. A type of semiconductor random access memory that stores information in integrated circuits that contain capacitors. Because capacitors lose their charge over time, the dynamic RAM must be periodically "refreshed" or recharged. Contrast with SRAM. See also VRAM.

EEPROM Electronically Erasable Programmable Read Only Memory. A special type of PROM that can be erased by exposing it to an electrical charge. Like other types of PROM, EEPROM retains its contents even when the power is turned off. Also like other types or ROM, EEPROM is not as fast as RAM. See also PROM, ROM, and RAM.

FC-AL Fibre Channel Arbitrated Loop A connector that provides high bandwidth, increased distance, and additional connectivity from host to peripherals.

FIFO First-In First-Out Memory that stores data in queue order so the first input element goes out the first.

FRU Field Replaceable Unit.

GUI The graphical user interface, or GUI, is a window that provides the user with a method of interacting with the computer and its special applications, usually with a mouse or other selection device. The window usually includes such things as windows, an intuitive method of manipulating directories and files, and icons.

HDLC High Level Data Link. A common layer two protocol that handles both data and control messages.

hop The number of routers a packet goes through before reaching its destination.

module A software component that may be loaded dynamically to monitor data resources of systems, applications and network devices.

node A node is a workstation or server.

OBDiag Standalone operation, without native operating system. Interactive menu driven, which provides ability to run tests from OBP level.

offline diagnostics Diagnostics that require the aid of the native operating system to function. Primarily tests components not currently in use by customer.

online diagnostics Diagnostics that require the aid of the native operating system to function. Primarily tests components currently in use by customer.

NUMA Non-Uniform Memory Access. CC/NUMA or CC-NUMA is Cache-Coherent Non-Uniform Memory Access. In a CC-NUMA machine, the physical address on the memory bus of a processing node is used to determine the home node memory location of a particular datum. The cache hierarchy on each processing node is constructed to replicate and hold copies of data from not only the local memory, but also the memory of remote nodes.

PICL Platform Information and Control Library.

POST Power on Self Test. Standalone operation, without native operating system. Mostly non interactive, automated tests, run when power is applied to the system.

production environment One of two environments in which software is deployed. The production environment is a "real" environment (as opposed to a test environment) in which you manage and monitor your hardware.

PROM Programmable Read Only Memory A memory chip on which data can be written only once. When a program has been written onto a PROM, it remains there forever. Unlike RAM, PROMs retain their data even when the power is turned off. See also RAM.

RAM Random Access Memory A type of computer memory that can be accessed randomly; that is, any byte of memory can be accessed without touching the preceding bytes. RAM is the most common type of computer and device memory.

ROM Read Only Memory Computer memory on which data has been prerecorded. Once data has been written onto a ROM chip, it cannot be removed and can only be read.

RTS/CTS Ready to Send/Clear to Send A hardware flow control handshake protocol used with serial lines.

SEEPROM Serial EEPROM. See also EEPROM.

segment An object representing a "segment" of the network, and used as a basis for a local network.

SNMP Simple Network Management Protocol. A simple protocol designed to allow networked entities (hosts, routers, and so on) to exchange monitoring information.

SNMPv2 usec SNMP version 2, user-based security model security standards.

SRAM Static Random Access Memory. A faster and more reliable RAM than dynamic random access memory (DRAM). DRAM offers access times of about 60 nanoseconds, while SRAM access can be as low as 10 nanoseconds. It is static because it does not require refreshment as does DRAM. See also VRAM.

standalone diagnostics Diagnostics that run without the aid of the native operating system. Usually an operating environment is built to provide basic scheduling capabilities.

standard error An open file normally connected directly to a primary output device, such as a terminal, printer, or screen. Error messages and other diagnostic output normally go to this file and then to the output device. You can redirect the standard error output into another file instead of to the printer or screen.

standard input (Standard input device) The device from which a program or system normally takes its input. Usually a terminal or the keyboard.

standard output (Standard output device) The device to which a program or system normally sends its output. Usually a terminal or the screen.

URL Uniform Resource Locator. A URL is a textual specification describing a resource which is network-accessible.

VRAM Video Random Access Memory. A type of dynamic RAM (DRAM) used in high-speed graphics frame buffers. With conventional DRAM, both the processor and the frame buffer logic must access RAM by sharing the same signal lines or buses on the RAM chips. VRAM provides separate buses for the processor and the frame buffer logic. See also DRAM, SRAM.

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