10.1 Introduction to the POST, obdiag, and SunVTS Diagnostic Tools

The following diagnostic tools are available for the Sun Fire V120 and Netra 120 servers:

- Power On Self Test (POST) Diagnostics
- OpenBoot Diagnostics (obdiag)
- SunVTS

If you need to contact Sun to report a problem with your system, it will help the engineers to resolve the problem if you can provide relevant diagnostic information from these tools.

10.1.1 Using POST Diagnostics

To view Power On Self Test (POST) diagnostic and error messages you need to have a serial connection set up to the server. For more information, see “Setting Up Serial Connections” on page 6-4.

If your system has the OpenBoot PROM (OBP) variable diag-switch? set to true, then POST diagnostics will run automatically when you power on the server. However, the default setting for diag-switch? is false.

To start POST diagnostics, at the ok prompt, do the following:

1. Type:

   ok setenv diag-switch? true
2. Type:

```
ok setenv diag-level value
```

where `value` is either min or max (depending on the quantity of diagnostic information you want to see).

3. Type:

```
ok reset-all
```

The system will now run POST diagnostics and display status and error messages in your console window. If POST detects an error, it displays an error message describing the failure. A sample error message is shown below:

```
Power On Self Test Failed. Cause: DIMM U0702 or System Board
```

4. When you have finished running POST, restore the value of `diag-switch?` to `false` by typing the following (this minimizes the booting time):

```
ok setenv diag-switch? false
```

10.1.2 Using OpenBoot Diagnostics (`obdiag`)

To run OpenBoot Diagnostics, do the following:

1. Type:
2. Type:

ok obdiag

This command displays the OpenBoot Diagnostics menu. FIGURE 10-1 Sample obdiag Menu

<table>
<thead>
<tr>
<th>obdiag</th>
<th>obdiag</th>
<th>obdiag</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 SUNW,lomb@14,200000 4 i2c-nvram@0,0 7 network@c,1 10 scsi@0,1 13 usb@5,3</td>
<td>2 ebus@c 5 ide@d 8 pmu@3 11 serial@0,2e8 14 usb@0,3</td>
<td>3 flashprom@10,0 6 network@5,1 9 scsi@8 12 serial@0,3f8</td>
</tr>
</tbody>
</table>

Commands: test test-all except help what printenvs setenv versions exit

The tests are described in TABLE 10-1. Note the number that corresponds to the test you want to perform, and use it with the test command. For example, to test the primary Ethernet port, type:

obdiag> test 7
Hit the spacebar to interrupt testing
Testing /pci@1f,0/ethernet@c .........................passed

Hit any key to return to the main menu.

3. When you have finished testing, exit OpenBoot Diagnostics and restore the value of auto-boot? to true.

To do this, type:

obdiag> exit
ok setenv auto-boot? true
ok auto-boot? true
ok boot

The function of each test is shown below. TABLE 10-1 Open Boot Diagnostics Tests

<table>
<thead>
<tr>
<th>Test number</th>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test</td>
<td>Description</td>
<td></td>
</tr>
<tr>
<td>-------------</td>
<td>--------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>SUNW,lomh@14,20000</td>
<td>tests the LOM device</td>
<td></td>
</tr>
<tr>
<td>ebus@c</td>
<td>tests the ebus interface</td>
<td></td>
</tr>
<tr>
<td>flashprom@10,0</td>
<td>tests the flashprom device</td>
<td></td>
</tr>
<tr>
<td>i2c-nvram@0,a0</td>
<td>tests the System Configuration Card</td>
<td></td>
</tr>
<tr>
<td>ide@d</td>
<td>tests the ide interface (to the CD-ROM or DVD drive)</td>
<td></td>
</tr>
<tr>
<td>network@5,1</td>
<td>tests the net1 Ethernet port</td>
<td></td>
</tr>
<tr>
<td>network@c,1</td>
<td>tests the net0 Ethernet port</td>
<td></td>
</tr>
<tr>
<td>pmu@3</td>
<td>tests the circuitry on the main CPU board</td>
<td></td>
</tr>
<tr>
<td>scsi@8</td>
<td>tests the internal SCSI interface</td>
<td></td>
</tr>
<tr>
<td>scsi@8,1</td>
<td>tests the external SCSI interface</td>
<td></td>
</tr>
<tr>
<td>serial@0,2e8</td>
<td>tests the serial B port (ttyb)</td>
<td></td>
</tr>
<tr>
<td>serial@0,3f8</td>
<td>tests the serial A/Lom port (ttya)</td>
<td></td>
</tr>
<tr>
<td>usb@5,3</td>
<td>tests usb interface 1</td>
<td></td>
</tr>
<tr>
<td>usb@c,3</td>
<td>tests usb interface 0</td>
<td></td>
</tr>
</tbody>
</table>

**Note** – If you have a PCI card installed in the server, then additional tests will appear on the obdiag menu.

### 10.1.3 Using SunVTS

SunVTS, the Sun Validation and Test Suite, is an online diagnostics tool which you can use to verify the configuration and functionality of hardware controllers, devices, and platforms. It runs in the Solaris operating environment and presents the following interfaces:

- Command line interface
- Serial (tty) interface
- Graphical interface within a windowed desktop environment.

SunVTS software lets you view and control a testing session on a remotely connected server. Below is a list of some of the tests that are available:

<table>
<thead>
<tr>
<th>Test</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>LE</td>
<td></td>
</tr>
<tr>
<td>10-2</td>
<td></td>
</tr>
<tr>
<td>Su</td>
<td></td>
</tr>
<tr>
<td>nV</td>
<td></td>
</tr>
<tr>
<td>TS</td>
<td></td>
</tr>
</tbody>
</table>
Tests

<table>
<thead>
<tr>
<th>Test</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>cdtest</td>
<td>Tests the CD-ROM drive</td>
</tr>
<tr>
<td>cputest</td>
<td>Tests the CPU</td>
</tr>
<tr>
<td>disktest</td>
<td>Tests the local disk drives</td>
</tr>
<tr>
<td>dvdstest</td>
<td>Tests the DVD drive</td>
</tr>
<tr>
<td>fputest</td>
<td>Tests the floating-point unit</td>
</tr>
<tr>
<td>nettest</td>
<td>Tests the Ethernet hardware on the system’s CPU board and the networking hardware on any optional plug-in boards in the system</td>
</tr>
<tr>
<td>netlbtest</td>
<td>Performs a loopback test to check that the Ethernet adapter can send and receive packets</td>
</tr>
</tbody>
</table>

### TABLE 10-2 SunVTS Tests

**SunVTS Test Description**

- `pmem` Tests the physical memory (read only)
- `sutest` Tests the server’s on-board serial ports
- `vmem` Tests the virtual memory (a combination of the swap partition and the physical memory)

10.1.3.1 To Find Out If SunVTS is Installed

- **Type:**

  ```bash
  # pkginfo -l SUNWvts
  ```

  If SunVTS software is loaded, information about the package will be displayed. If SunVTS software is not loaded, you will see the following error message:

  ```bash
  ERROR: information for “SUNWvts” was not found
  ```

10.1.3.2 Installing SunVTS

By default, SunVTS is not installed on the Sun Fire V120 or Netra 120 servers. However, it is available on the software supplement CD supplied with Solaris. For information about
downloading it from this CD, refer to the *Sun Hardware Platform Guide* for the release of Solaris you are using.

To find out more about using SunVTS, refer to the SunVTS documentation that corresponds to the Solaris release that you are running.

10.1.3.3 Viewing SunVTS Documentation

The SunVTS documents are included on the Software Supplement CD that is part of each Solaris Media Kit release and is also accessible at [http://docs.sun.com](http://docs.sun.com).

We recommend you consult the following SunVTS documents:

- *SunVTS User’s Guide* describes how to install, configure, and run the SunVTS diagnostic software.
- *SunVTS Quick Reference Card* provides an overview of how to use the SunVTS CDE interface.
- *SunVTS Test Reference Manual* provides details about each individual SunVTS test.

10.1.3.4 Using the SunVTS Graphical User Interface

To test the Sun Fire V120 or Netra 120 server by running a SunVTS session from a workstation using the SunVTS graphical user interface, follow the procedure below.

1. Use the `xhost` command to give the remote server access to the local display.
   
   Type:
   ```
   # /usr/openwin/bin/xhost + remote_hostname
   ```

2. Remotely log in to the server as superuser or root.

3. Type:
   ```
   # cd /opt/SUNWvts/bin # ./sunvts -display local_hostname:0
   ```

   where `local_hostname` is the name of the workstation you are using.

**Note** – The directory `/opt/SUNWvts/bin` is the default directory for SunVTS software. If you have the software installed in a different directory, use that path instead.

When you start SunVTS software, the SunVTS kernel probes the test system devices and displays the results on the Test Selection panel. There is an associated SunVTS test for each hardware device on your system.

You can fine-tune your testing session by selecting the appropriate check boxes for each of the tests you want to
10.2 Additional Diagnostic Tests for Specific Devices

10.2.1 Using the `probe-scsi` Command To Confirm That Hard Disk Drives Are Active

The `probe-scsi` command transmits an inquiry to SCSI devices connected to the system’s internal SCSI interface. If a SCSI device is connected and active, the command displays the unit number, device type, and manufacturer name for that device.

**FIGURE 10-2** `probe-scsi` Output Message

```
ok probe-scsi
Target 0
  Unit 0  Disk  SEAGATE ST336605LSUN36G 4207
Target 1
  Unit 0  Disk  SEAGATE ST336605LSUN36G 0136
```

The `probe-scsi-all` command transmits an inquiry to all SCSI devices connected to both the system’s internal and its external SCSI interfaces. **FIGURE 10-3** shows sample output from a Sun Fire V120 with no externally connected SCSI devices but containing two 36 GB Hard Disk Drives, both of them active.

**FIGURE 10-3** `probe-scsi-all` Output Message

```
ok probe-scsi-all
/pci@1f,0/pci@1/scsi@8,1

  /pci@1f,0/pci@1/scsi@8

Target 0
  Unit 0  Disk  SEAGATE ST336605LSUN36G 4207
Target 1
  Unit 0  Disk  SEAGATE ST336605LSUN36G 0136
```
10.2.2 Using the `probe-ide` Command To Confirm That the DVD or CD-ROM Drive is Connected

The `probe-ide` command transmits an inquiry command to internal and external IDE devices connected to the system’s on-board IDE interface. The following sample output reports a DVD drive installed (as Device 0) and active in a Sun Fire V120 server.

![FIGURE 10-4](image)

```
ok probe-ide
Device 0 ( Primary Master )
Removable ATAPI Model: DV-28E-B

Device  1  (  PrimarySlave )
       Not Present

Device  2  (  Secondary Master )
       Not Present

Device  3  (  Secondary Slave )
       Not Present
```

10.2.3 Using the `watch-net` and `watch-net-all` Commands To Check the Network Connections

The `watch-net` diagnostics test monitors Ethernet packets on the primary network interface. The `watch-net-all` diagnostics test monitors Ethernet packets on the primary network interface and on any additional network interfaces connected to the system board. Good packets received by the system are indicated by a period (.). Errors such as the framing error and the cyclic redundancy check (CRC) error are indicated with an X and an associated error description.

Start the `watch-net` diagnostic test by typing the `watch-net` command at the ok prompt. For the `watch-net-all` diagnostic test, type `watch-net-all` at the ok prompt.

![FIGURE 10-5](image)

```
{0} ok watch-net
Internal loopback test -- succeeded.
```
Link is -- up
Looking for Ethernet Packets.
‘.’ is a Good Packet. ‘X’ is a Bad Packet.
Type any key to stop.................................

FIGURE 10-6 watch-net-all Diagnostic Output Message

{0} ok
watch-net-all
/pci@1f,0/pci@0,1/network@c,1
Internal loopback test -- succeeded.
Link is -- up
Looking for Ethernet Packets.
‘.’ is a Good Packet. ‘X’ is a Bad Packet.
Type any key to stop.

10.3 Solutions to Problems You Might Encounter

Problem: Cannot Set Up a Console Connection to the Server

The Sun Fire V120 and Netra 120 servers’ serial port pinouts are listed in Chapter 6. Check that they are correct for the device (that is, the terminal or terminal server) that you are connecting to the server.

Problem: Cannot Display the lom> Prompt Using the “#.” Escape Sequence

Check whether the first character of the “#.” escape sequence has been changed (this is a user-configurable value). To check the current value, type the following from the Solaris prompt:

# lom -c
The information that this command displays includes the “serial escape character”. If this is not “#”, then type the character that is currently specified and follow it immediately with a dot.

**Problem: OpenBoot PROM Initialization Aborts and the Server Will Not Boot**

If the OpenBoot PROM initialization sequence aborts and the message ‘NO IDPROM’ is displayed when the operating system is attempting to read the serial number and MAC address, then you are attempting to boot without a valid System Configuration Card inserted. The System Configuration Card contains the serial number, MAC address, and NVRAM settings for the server.

**Problem: Card Not Recognised During Installation or Bootup**

The Sun Fire V120 and Netra 120 servers are fitted with a System Configuration Card. If the card moves during transit then the server will not be able to read the card, and as a result will not boot.

If the System Configuration Card has moved during transit, follow the steps below to make sure it is seated in the server correctly.

**Note** – The presence of the tie-wrap does not necessarily mean that the card is correctly located in the reader.

1. Remove the front bezel by pushing on the clips at both ends until they release.
2. Press the System Configuration Card in as far as it will go.
3. Replace the bezel and continue installation.

For more information about the System Configuration Card, see Section 11.1, “Replacing a Server” on page 11-2.

**10.4 Interpreting the Front and Back Panel LEDs**

The Sun Fire V120 and Netra 120 servers each contain two front panel LEDs:

- **A Power LED** (see FIGURE 10-7) This LED is lit when the server is powered on. It is unlit when the server is in standby mode.
- **A Fault LED** (see FIGURE 10-7) When the Fault LED is lit (but not flashing), this indicates a problem that is not fatal to the server but that you should attend to as soon as possible. Circumstances that cause the Fault LED to light up include the following:
  - The temperature inside the server’s enclosure is unusually high.
  - The voltage on one of the server’s output supply rails is unusually high.
  - One of the server’s internal circuit breakers has tripped, indicating a problem with a device connected to the SCSI or USB ports.
  - The System Configuration Card, containing the server’s serial number, MAC address and NVRAM
settings, has been removed.

- One of the DC power inlets has failed.
- The LOM watchdog has timed out, indicating that the server has locked up. You can configure the server to restart automatically after a lockup (see Section 9.2, “Configuring Automatic Server Restart (ASR)” on page 9-8).

When the Fault LED flashes on and off, a problem has occurred that is fatal to the server. Circumstances that cause the Fault LED to flash include the following:

- The speed of one of the fans inside the server is too low.
- The temperature inside the server’s enclosure is too high. (By default, this causes the server to shut down. For information about configuring the server not to shut down in this condition, see Appendix C.)
- The voltage on one of the server’s output supply rails is too high. (By default, this causes the server to shut down. For information about configuring the server not to shut down in this condition, see Appendix C.)
- The temperature inside the CPU is too high. (This causes the server to shut down.)

The server contains four rear panel LEDs (see FIGURE 10-8):

- **A Power LED**
  This replicates the Power LED on the front panel.

- **A Fault LED**
  This replicates the Fault LED on the front panel.

- **A Link LED for each Ethernet port**
  The light comes on to indicate that a connection has been established to the hub.