Oracle® x86 Server Diagnostics Guide

Contents

Preface

To determine whether your product supports these diagnostic applications, see the *Product Notes* for your server.

Related Documentation

For a description of the document set for your x86 Sun Fire or Sun Blade server, see the *Getting Started Guide* that is packed with your system and also posted on the product's documentation site. Go to the following URL, then navigate to your product.

http://docs.sun.com/

Translated versions of some of these documents are available at the web site described above. English documentation is revised more frequently and might be more up-to-date than the translated documentation.

About This Documentation (PDF and HTML)

This documentation set is available in both PDF and HTML. The information is presented in topic-based format (similar to online help) and therefore does not include chapters, appendices or section numbering.

Typographic Conventions

Typeface	Meaning	Examples
AaBbCc123	The names of commands, files, and directories; onscreen computer output	Use dir to list all files.
AaBbCc123	What you type, when contrasted with onscreen computer output	> **ipconfig** 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. You *must* have administrator privileges to do this. To delete a file, type del *filename*.
AaBbCc123	Titles of dialog boxes, text in dialog boxes, options, menu items and buttons.	1. On the File menu, click Extract All.

Documentation Comments

Oracle is interested in improving the product documentation and welcome your comments and suggestions. You can submit comments by clicking the Feedback {+} link at http://docs.sun.com.

Change History

The following lists the release history of this documentation set:

- June 2010, initial publication.

Diagnostics Guide

The section contains information and procedures for maintaining and servicing your server. The table below describes how this content is organized.

Section	Link
An overview and introduction to the diagnostic tools available for Oracle Sun Fire and Sun Blade servers.	"Introduction to Diagnostic Tools" on page 9
An explanation of the U-Boot diagnostic's startup tests.	"U-Boot Diagnostic Startup Tests" on page 21
An overview and introduction to the Pc-Check Diagnostic Utility.	"Pc-Check Diagnostics Utility" on page 35
Procedures for accessing the Pc-Check Diagnostic Utility.	"Accessing the Pc-Check Diagnostics Utility on the Tools and Drivers CD/DVD" on page 55

Introduction to Diagnostic Tools

This section provides an introduction to the diagnostic tools available for the x86 architecture Sun Fire and Sun Blade servers. The topics included in this section:

- "About Diagnostic Tools" on page 9
- "Diagnostic Tools for Oracle Servers" on page 11
- "Using the Diagnostic Tools to Troubleshoot a Server" on page 14

About Diagnostic Tools

All diagnostics have the same goals, to stimulate some component or components, observe the behavior of the component(s) under test, and determine whether the behavior is expected. If the behavior is not expected, diagnostic tools can identify the likely cause of the error and send a clear message or notification to the user.

Diagnostics are used at different stages of a system's use: from initial power-on to ensure that the system is stable before loading an operating system (OS), after the OS is running to isolate failures that might occur during runtime or to run more exhaustive system-wide tests than can be run before an OS is installed, and as runtime tests to monitor system health. This information is described in the following topics:

- "Strategy for Diagnostics" on page 9
- "Service Processor" on page 10
- "Standalone Package-Based Diagnostics" on page 10
- "Offline Operating System-Based Diagnostics" on page 10
- "Online Operating System-Based Diagnostics" on page 11

Strategy for Diagnostics

To be effective, troubleshooting and diagnoses must be systematic and progressive. Therefore, when diagnosing server problems, follow these steps:

1. Use the firmware diagnostics to validate the (Integrated Lights Out Manager) ILOM service processor (SP) hardware.

2. Given a stable SP, expand the scope and coverage using the standalone diagnostics.

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3. Use operating system-based diagnostics for full system-level exercisers.

   See:

   - "Service Processor" on page 10
   - "Standalone Package-Based Diagnostics" on page 10
   - "Offline Operating System-Based Diagnostics" on page 10
   - "Online Operating System-Based Diagnostics" on page 11

Service Processor

ILOM SP uses Linux. The first code executed by the SP is a small boot loader known as U-Boot. The U-Boot code performs similar functions to the basic input/output system/power-on self test (BIOS/POST) in that it initializes devices, with minimal testing, and boots the Linux kernel.

Standalone Package-Based Diagnostics

Diagnostics that are performed before the OS is booted can assume complete control of a subsystem or system's resources. These diagnostics support the most thorough testing of components, because the diagnostics control all the resources being tested. However, the effort to write the code to manage all resources being tested, while providing fine-grained control, can be quite complex (effectively a light-weight OS tailored to testing). To avoid development of such a complex infrastructure, pre-OS diagnostics might provide thorough, targeted testing of components in isolation.

Standalone diagnostics are typically run in manufacturing or at a customer site during a new system installation. In this environment the diagnostics can be run without being concerned about corrupting or destroying customer data. Diagnostics can also assume that there are no restrictions on resource utilization (for example, they can force CPU or I/O boundary conditions to achieve effective testing) since the systems are not in use by customers.

Offline Operating System-Based Diagnostics

When diagnostics are written on top of an operating system, the diagnostics can rely on the resources of the OS (for example, process scheduling) to allow simultaneous testing of multiple components. However, some direct control of the components might be lost. That is, the OS enforces encapsulation of hardware resources, as necessary, to prevent access by the diagnostics to ensure reliable system behavior.

Further, since the OS inherently manages system resources, exercisers can be built using the OS that can test multiple subsystems simultaneously.

Online Operating System-Based Diagnostics

Online OS diagnostics are similar to offline OS diagnostics in terms of support of resources. However, these diagnostics are run in customer sites and cannot alter data repositories. the diagnostics must be careful not to over utilize system resources (for example, these diagnostics must not consume too many CPU cycles or too much network bandwidth).

Note – Oracle does not expect customers to run online diagnostics because those diagnostics drain compute resources and have limited effectiveness due to their inability to lock resources.

Diagnostic Tools for Oracle Servers

This section describes the following diagnostic tools and provides or points to information about how to run them:

BIOS/POST

The BIOS boot code is the most basic diagnostic tool. It begins executing when the server enters full-power mode. The execution of code follows a sequence of hardware checks and tests called POST (power-on self-test). POST focuses on thoroughly testing devices as well as providing meaningful information to users when errors occur. POST works in conjunction with other processes to complete initialization and booting. The POST sequence ends when the operating system boots.

U-Boot

At system startup, the U-Boot diagnostic software initializes on your server and tests aspects of the server SP prior to booting the ILOM firmware. The U-Boot diagnostic tests are designed to test the hardware required to enable the server SP to boot successfully. Some of the hardware components tested by U-Boot include:

- SP memory
- Network devices
- I/O devices
- I2C devices

For additional information about the purpose and use of the U-Boot diagnostic software, see "U-Boot Diagnostic Startup Tests" on page 21.

For instructions for running U-Boot, see "Running the U-Boot Diagnostic Tests" on page 26.

Pc-Check

Server diagnostics are contained in the disk operating system-based (DOS-based) Pc-Check utility. This utility can be accessed from ILOM if your server contains an SP, or the utility can be accessed and executed from your server Tools and Drivers CD/DVD. Pc-Check tests all motherboard components (CPU, memory, and I/O), ports, and slots. When enabled, this utility runs at host power-on. The Pc-Check utility is disabled by default in ILOM.

Note – When running the Pc-Check utility on servers that do not have an SP, transfer the Pc-Check utility from the Tools and Drives CD/DVD to the server's universal serial bus (USB) flash drive and run the utility from the flash drive.

If you encounter any hardware-related error message (such as memory errors or hard disk errors) on your server, run one of the following:

- Advanced Diagnostics Test—A specific hardware component test
- Immediate Burn-in Test—A server diagnostic test script

For additional information about the purpose and use of the Pc-Check diagnostic software, see "Pc-Check Diagnostics Utility" on page 35.

For instructions for accessing the Pc-Check diagnostic software, see "Accessing Pc-Check Diagnostics Utility" on page 36.

SunVTS

SunVTS (Sun Validation Test Suite) tests and validates Oracle's Sun hardware by verifying the connectivity and functionality of hardware devices, controllers and peripherals. SunVTS is used to ensure the proper operation of the overall system under test and its underlying hardware. It stimulates, detects, and identifies hardware faults and is used for both hardware validation and repair verification.

SunVTS provides the following tests:

- CD DVD Test (cddvdtest)
- CPU Test (cputest)
- Cryptographic Test (cryptotest)
- Disk and Diskette Drives Test (disktest)

- Data Translation Look-aside Buffer Test (dtlbtest)
- Emulex host bus adapter (HBA) Test (emlxtest)
- Floating Point Unit Test (fputest)
- InfiniBand Host Channel Adapter Test (ibhcatest)
- Level 1 Data Cache Test (l1dcachetest)
- Level 2 SRAM Test (l2sramtest)
- Ethernet Loopback Test (netlbtest)
- Network Hardware Test (nettest)
- Physical Memory Test (pmemtest)
- QLogic Host Bus Adapter Test (qlctest)
- RAM Test (ramtest)
- Serial Port Test (serialtest)
- System Test (systest)
- Tape Drive Test (tapetest)
- Universal Serial Board Test (usbtest)
- Virtual Memory Test (vmemtest)

SunVTS software has a sophisticated graphical user interface (GUI) that provides test configuration and status monitoring. The user interface can be run on one system to display the SunVTS testing of another system on the network. SunVTS software also provides a teletype-mode (TTY-mode) interface for situations in which running a GUI is not possible.

Snapshot Utility

The purpose of the Snapshot utility is to collect data for use by Oracle Services to diagnose problems. This utility enables you to produce a snapshot of the server SP at any instant in time.

Note – Customers should not run this utility unless requested to do so by Oracle Services.

The ILOM Snapshot utility gathers server SP state data. It collects log files, runs various commands and collects their output, and sends the data collection as a downloaded file to a user-defined location.

Running the Snapshot Utility

You can run the utility using either the ILOM command-line interface (CLI) or the ILOM web interface. For instructions for running the utility, refer to the *Oracle Integrated Lights Out Manager 3.0 User's Guide* in your server's document collection.

Using the Diagnostic Tools to Troubleshoot a Server

This section provides some basic troubleshooting recommendations. The following topics are covered:

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Troubleshooting Scenarios

There are four basic scenarios that you can expect to encounter during life of a server:

- **Scenario 1 (Typical first time server installations: No server options need to be installed)**—If the server was shipped to you with all the server options you ordered already installed, run the diagnostic tests before placing the server into service. This way you can verify whether the server is in good working order or not (the server might have been damaged in shipment). If the diagnostic tests indicate that the server has a faulty component, notify the seller (Oracle or the Oracle reseller) that the server failed initial testing and should be repaired or replaced.

- **Scenario 2 (First time server installations: Server options shipped separately and need to be installed)**—If the server was shipped to you with options that you need to install, run the diagnostic tests before installing the options. This will ensure that the server arrived in good working order. Only after determining that the server is in good working order should you install the options. After installing the options, you should run the diagnostic tests again to ensure that the server is in good working order with the options installed. Then you can place the server into service. If the diagnostic tests reveal that an installed option is faulty, remove the option and return it for replacement.

- **Scenario 3 (Upgrading a server: You have placed the server into service and then you receive an upgrade or option that needs to be installed)**—In this case, take the server out of service, run the recommended diagnostic tests, install the upgrade, and then run the diagnostic test again before placing the server back into service. If the diagnostic tests reveal that the installed upgrade is faulty, remove the upgrade and return the upgrade for replacement.

- **Scenario 4 (An in-service server fails: You placed the server into service and it has been operating properly for a period of time but then fails)**—In this case, take the server out of service, do a visual inspection of the server's internal components to see if you can detect any obvious problems (such as a burnt component or dust accumulation that is preventing cooling of server components). If necessary, run the recommended diagnostic tests to identity the faulty component, remove and replace the faulty component, run the diagnostic tests again to ensure that the server has been repaired, and then place the server into service.

Note – For scenario 4, if you have a service contract with Oracle that includes the Automated Service Request (ASR) service, Oracle Service diagnoses and repairs server failures. Whether you have the ASR service or not depends on availability of this support to your site.

The following table provides step-by-step troubleshooting procedures.

Troubleshooting Scenarios	Do this...
Scenario 1: Typical first time server installations (no server options that need to be installed)	Before you place a server into service, that is, configure the server's operating system and use it to process data, run the following diagnostic tests to confirm that the server arrived in good operating condition: ■ U-Boot ■ Pc-Check **Tests failed:** If the previous tests identify a server failure, assume that the server was damaged in shipment. Terminate the installation process and notify Oracle Service of the problem. These steps ensure that the server is covered under warranty. **Tests passed:** Place the server into service. Note – If a network connectivity problem occurs when placing a server into service for the first time, ensure that the network access point for the server is activated.

Troubleshooting Scenarios	Do this...
Scenario 2: First time server installations (server options need to be installed)	Before you install the server options that shipped separately and place a server into service, that is, configure the server's operating system and use it to process data, run the following diagnostic tests to confirm that the server arrived in good operating condition: ■ U-Boot ■ Pc-Check **Tests failed:** If the previous tests identify a server failure, assume that the server was damaged in shipment. Terminate the installation process and notify Oracle Service of the problem. These steps ensure that the server is covered under warranty. **Tests passed:** If the previous tests show the server to be in good working order, do the following before placing the server into service: ■ Install the server options that were shipped separately. ■ Run U-Boot. ■ Run Pc-Check. **Note –** If a network connectivity problem occurs when placing a server into service for the first time, ensure the network access point for the server is activated.

Troubleshooting Scenarios	Do this...
Scenario 3: Upgrading a server that has been in service	Before you install a server upgrade (memory, hard disk drives, I/O cards, or power supply), take the server out of service and run the diagnostic tests to confirm that the server is in good operating condition.

Follow these steps:
1. Take the server out of service.

2. Run the following diagnostic tests:

   ■ U-Boot
   ■ Pc-Check

3. Install the server upgrade.

4. Run the diagnostic tests again.

Tests failed: If the diagnostic tests identify a server component failure, one of the installed options was faulty or the server was damaged when you installed the options. In either case, remove and replace the faulty component, run the above diagnostic tests again to confirm that the problem has been corrected, and place the server into service.

Note – If the failed component is a non-replaceable component on the server's motherboard, the motherboard can be returned to Oracle for repair or a replacement motherboard can be ordered and replaced in the field by authorized service personnel.

Tests passed: Place the server into service.

Troubleshooting Scenarios	Do this...

Scenario 4: The server has been operating problem free for a long time (for example, months or years) and the Service Action Required LED on the server's front panel illuminates.	Do the following:
	1. Before opening the server's cover, inspect the server and SP log files for obvious fault messages and any fault LED indicators.
	
	2. Inspect the server's internal components for obvious problems, such as:
	
	  ■ A burnt component
	
	  ■ A smell caused by a burnt component
	
	  ■ Anything that would inhibit proper cooling of server components, such as the accumulation of dust on the CPU heatsinks
	
	  ■ If the visual inspection does not identify a failed component, run the following diagnostic tests to identify the failed component:
	
	  ■ U-Boot
	
	  ■ Pc-Check
	
	  ■ If the previous tests do not identify the failed component, run SunVTS.
	
	  ■ If the failed component is a customer-replaceable unit (CRU), replace it. CRUs are defined in the service manual for the particular server model.
	
	  ■ If the failed component is a field-replaceable unit (FRU), initiate a service request with Oracle Service. FRUs are defined in the service manual for the particular server model.
	
	  Note – If the failed component is a non-replaceable component on the server's motherboard, the motherboard can be returned to Oracle for repair or a replacement motherboard can be ordered and replaced in the field by authorized service personnel.
	
	  Note – For scenario 4, if you have a service contract with Oracle that includes the ASR service, then Oracle Service diagnoses and repairs server failures. Whether you have the ASR service or not depends on availability of this support to your site.

> ⚠️ **Caution –** If you do not have a replacement component for a failed component and you want to place the server into service, before doing so, replace the faulty component with a filler panel. Placing the server into service without a filler panel in a blank component space could cause the server to overheat and shut down.

Diagnostic Test Coverage

This table shows which server components are tested by the different diagnostic tests: U-Boot, Pc-Check, and SunVTS.

Server Components Tested	U-Boot	Pc-Check	SunVTS
Service Processor	Yes	Partial coverage	Partial coverage
CPU/Memory	No	Yes	Yes
I/O Hub	No	Yes	Yes
I/O Controller Hub	No	Yes	Yes
Fans	No	Yes	Yes
Power Supplies	No	Yes	Yes
Storage Drives	No	Yes	Yes
Storage Drive Backplane	No	Yes	Yes
Network Interface	No	Partial coverage	Yes

Setting Up a Server for Testing

Diagnostic tests can be run locally using the server's serial port (SER MGT) or over the network using the server's network management port (NET MGT). For instructions for connecting the server locally or over the network, refer to the hardware installation guide for your server.

U-Boot Diagnostic Startup Tests

This section describes the U-Boot diagnostic tests that automatically run each time you start or reboot your server. Specifically, this section includes information about the purpose of U-Boot startup diagnostic tests, how to run the tests, and finally, it presents sample test outputs for each U-Boot test mode.

Topics contained in this section are:

U-Boot Diagnostic Startup Tests Overview

At system startup, the U-Boot diagnostic software initializes on your server and tests aspects of the server service processor (SP) prior to booting the Integrated Lights Out Manager (ILOM) firmware. The U-Boot diagnostic tests are designed to test as much as the hardware required to enable the server SP to boot successfully. Some of the hardware components tested by U-Boot include:

- SP memory
- Network devices
- I/O devices
- I2C devices

The topics contained in this section are:

System Diagnostic Test Options at Startup

At system startup, a series of diagnostic tests are run on the server host and SP prior to booting the host operating system and the ILOM SP firmware. Some of these diagnostic tests are run by

default, while others are optional tests you can choose to run. To determine which startup diagnostic tests are run by default and which diagnostic tests are optional and available to run, see the following table.

Component	Startup Diagnostic Options	Default Test	Optional Test
Server SP	■ U-Boot -Normal mode (default mode) See "U-Boot Diagnostic Test Modes–Normal, Quick, and Extended" on page 23 for more information.	X	
	■ U-Boot -Quick mode See "U-Boot Diagnostic Test Modes–Normal, Quick, and Extended" on page 23 for more information.		X
	■ U-Boot -Extended mode See "U-Boot Diagnostic Test Modes–Normal, Quick, and Extended" on page 23 for more information.		X
Server Host	■ BIOS power-on self-test (POST) See the server Service Manual.	X	
	■ Pc-Check 3-minute or 30-minute test See "Pc-Check Diagnostics Utility" on page 35.		X

U-Boot Diagnostic Test Modes–Normal, Quick, and Extended

U-Boot offers three diagnostic modes of operation: -Normal, -Quick, and -Extended. -Normal mode diagnostic tests are run by default each time the server starts up. Other modes of operations (-Quick or -Extended) must be selected to run at startup.

For details about which U-Boot diagnostic tests are run for each mode, see the following table. For details about how to select one of the three U-Boot modes to run at system startup, see "How to Select a U-Boot Diagnostic Mode to Run at Startup" on page 27.

Note – If any of the U-Boot diagnostic tests fail during startup, the server SP will not start. See "Reporting Diagnostic Failures at System Startup" on page 24 for additional details.

U-Boot Component Test	Normal	Quick	Extended	Purpose
Memory Data Bus Test	X	X	X	Checks for opens/shorts on SP Memory's data bus.
Memory Address Bus Test	X	X	X	Checks for opens/shorts on SP Memory's address bus.
Memory Data Integrity Test			X	Checks for data integrity on the SP Memory.
Flash Test			X	Checks access to Flash.
WatchDog Test			X	Checks the WatchDog functionality on the SP.
I2C Probe Tests	X		X	Checks the connectivity to I2C devices on standby power.
Ethernet Test	X	X	X	Verifies ability to read from specified Ethernet port.
Ethernet Link Test	X	X	X	Verifies link on specified PHY.

U-Boot Component Test	Normal	Quick	Extended	Purpose
Ethernet Internal Loopback Test	X		X	Verifies Ethernet functionality by sending and receiving packets.
Real Time Clock Test	X		X	Checks functionality of the real-time clock on the SP.
USB 1.1 Test			X	Checks USB 1.1 functionality.
USB 1.1 BIST				Runs internal USB 1.1 built-in self-test (BIST).
USB 2.0 Test			X	Checks USB 2.0 functionality.
BIOS Flash ID Test	X		X	Verifies ability to read from the BIOS flash.
Serial Presence Detect (SPD) Access Test			X	Verifies DIMM SPD access along with checksum and prints SPD information.
Power CPLD Test	X	X	X	Verifies the correct power revision of the complex programmable logic device (CPLD). [1]

[1] For rackmount servers, the I2C tests check the connectivity to all I2C devices installed in the chassis. For Oracle's Sun Blade 6000 or 6048 Chassis Modular Systems, the I2C tests check only the connectivity to I2C devices installed on an individual server module.

Reporting Diagnostic Failures at System Startup

After U-Boot completes the diagnostic test, the test output and a final status of the U-Boot test appears on your screen. If a hardware failure is detected by U-Boot, the failure is reported in the test output. To view samples of the U-Boot test outputs, see "Sample U-Boot Test Output" on page 27.

Note – For troubleshooting purposes, a -Failed or -Passed status of the last U-Boot test performed on the server is also stored in the SP environmental variables. To view a sample output of the environmental variables showing the status of the U-Boot test, see Example 4.

When troubleshooting your system, note that the symptoms of a diagnostic failure can vary depending on whether the diagnostics at startup have failed on the server SP or host. For additional details about how to determine where the diagnostics failed at startup and possibly locate additional information about the failure, see the following table.

Component	Failure Status and Symptoms
Server SP (U-Boot)	■ When the component failure is detected on the server SP, the failure is typically reported in the following locations: – U-Boot test results For sample output of U-Boot test results, see "Sample U-Boot Test Output" on page 27 . – ILOM event log. For details about how to access this log, refer to the information about the ILOM event log in the *Oracle Integrated Lights Out Manager 3.0 User's Guide*. – Fault Management tab in the ILOM web interface For more details about access and use of fault management, refer to the information about ILOM fault management in the *Oracle Integrated Lights Out Manager 3.0 User's Guide*. To determine which faults you must manually clear on your server, refer to the platform ILOM Supplement Guide for your server. ■ If a component failed to start, the Service Action Required LED on the front panel of the server illuminates. ■ If the U-Boot diagnostic test failed, the server SP will not start.

Component	Failure Status and Symptoms
Server Host (BIOS POST)	■ When the component failure is detected on the server host, the failure is typically reported in the following locations: – Fault Management tab in the ILOM web interface For more details about access and use of fault management, refer to the information about ILOM fault management in the *Oracle Integrated Lights Out Manager 3.0 User's Guide*. To determine which faults you must manually clear on your server, refer to the platform ILOM Supplement Guide for your server. – ILOM event log. For details about how to access this log, refer to the information about the ILOM event log in the *Oracle Integrated Lights Out Manager 3.0 User's Guide*. ■ If a component failed at startup, the Service Action Required LED on the front panel of the server illuminates. ■ If the BIOS POST detected a fatal error, the host operating system will not start.

Running the U-Boot Diagnostic Tests

The U-Boot diagnostic test in -Normal mode automatically runs each time you start your server. However, if you would like to run the U-Boot diagnostic test in -Quick or -Extended mode, you must select these modes to run at startup. For further details about how to select one of the three U-Boot diagnostic modes to run at startup, see the following procedure.

■

All U-Boot diagnostic tests are required to run from a serial connection. You must have either a hyper terminal or network serial console connected to the server.

For information about how to connect a local serial console to the serial port on the server, refer to the installation guide for your server. For information about how to establish a network serial connection to the SP, see the *Oracle Integrated Lights Out Manager 3.0 User's Guide*.

▼ How to Select a U-Boot Diagnostic Mode to Run at Startup

1 **Establish a serial connection to the server SP.**

For details, see either the installation guide for your server or the *Oracle Integrated Lights Out Manager 3.0 User's Guide.*

2 **Power cycle or reset the server.**

The Power/OK LED blinks slowly as U-Boot executes. The U-Boot output is sent directly to the server serial port.

For details about how to power on or restart your server, see the installation guide for your server.

3 **Watch for the following prompt to appear in the U-Boot output and do one of the following:**

```
Enter Diagnostics Mode {'q'uick/'n'ormal (default)/e'x'tended]...
```

- Type "**n**" to enable Normal U-Boot tests; or let the countdown continue to run Normal mode.
- Type "**q**" to enable Quick U-Boot tests.
- Type "**x**" to enable Extended U-Boot component tests.

4 **Monitor U-Boot output from the serial console connection.**

If there is a diagnostic failure, the SP will not start. See "Reporting Diagnostic Failures at System Startup" on page 24 for more details.

Sample U-Boot Test Output

This section presents sample test outputs for each U-Boot test mode:

- "U-Boot Normal Mode– Test Output Sample" on page 27
- "U-Boot Quick Mode– Test Output Sample" on page 29
- "U-Boot Extended Mode– Test Output Sample" on page 30

U-Boot Normal Mode– Test Output Sample

Example 1 is a sample output of a U-Boot test after it ran in -Normal mode.

EXAMPLE 1 U-Boot Normal Mode– Test Output

```
U-Boot 1.1.4

Custom AST2100 U-Boot 2.0 (Jan 26 2009 - 10:29:26) r41480
```

EXAMPLE 1   U-Boot Normal Mode– Test Output   *(Continued)*

```
DRAM:   119 MB
Flash bank 0 at 10000000 has 0x2000000 bytes in 256 sectors (chipSize 1<<25, size_ratio
1).
Flash: 32 MB

readonly: ethaddr=00:14:4F:CA:B5:10

readonly: eth1addr=00:14:4F:CA:B5:11
VUART1 already enabled at port 0x03f8, SerIRQ[4] rise
Protecting U-Boot flash sectors; monitor_base=100a0000.
Negating BIOS_TOP_BLOCK_LOCK signal.

H/W: <product_name> Service Processor; SOC: AST2100 Rev. 02 ('A3')
PWC_SP_Broken_OD = 0;  ARM restart caused by: watch-dog ExtRst# pin
The host is OFF(S5) (hostWantsPwr=0, powerGood=0,
allowPwrOn=0|0, outOfReset=0, fatalError=0).
Reset straps=0x88819180, def. H-PLL=264 MHz, CPU/AHB=2:1, boot CS0# normal speed
PCI w/VGA noVBIOS;  DRAM clock is M-PLL: 264 MHz (DDR2-528)
DRAM: 128MB data - 8MB VGA, 32-bit noECC, 2 BA 10 CA, CL=4 BL=4 ap=1, 61440 us refr
Board Revision - cc
Net:   faradaynic#0, faradaynic#1

Enter Diagnostics Mode ['q'uick/'n'ormal(default)/e'x'tended(manufacturing mode)] .....0
Diagnostics Mode - NORMAL
<DIAGS> Memory Data Bus Test ... PASSED
<DIAGS> Memory Address Bus Test ... PASSED
I2C Probe Test - Motherboard
Bus Device                     Address Results
========================================
1 Temp.Sensor (VM75)(U3006) 0x90 PASSED
2 Sys FRUID   (U3003)       0xA0 PASSED
2 Power CPLD  (U3301)       0x4E PASSED
2 CPU0 Fault LED's (U3001)  0x40 PASSED
2 CPU1 Fault LED's (U3002)  0x42 PASSED
2 PCA9555 (Misc) (U3005)    0x44 PASSED
2 DIMM IMAX (U3102)         0x12 PASSED
6 Bank Panel Led's (U2701)  0xC6 PASSED
6 DS1338(RTC)( U803)        0xD0 PASSED

I2C Probe Test - Chassis (2U)
PDB Board:
Bus Device              Address Results
========================================
1   PCA9548 Mux (U0202) 0xE0    PASSED
1   PDB FRUID (U0203)   0xAA    PASSED
1   MAX7313 (U0201)     0x40 PASSED

Power Supply 0
Bus Device          Address    Results
========================================
1 0 PS 0 FRUID ( - ) 0xAC      PASSED
1 0 PS 0 CTRL (-)    0x7C       PASSED

Power Supply 1
Bus  Device          Address Results
```

EXAMPLE 1 U-Boot Normal Mode– Test Output *(Continued)*

```
=========================================
1 1  PS 1 FRUID (-) 0xAC     PASSED
1 1  PS 1 CTRL ( - )0x7C     PASSED

Fan Module  1
Bus  Device                Address  Results
=========================================
1 2  FM 1 FRUID   (U0203) 0xAC      PASSED
1 2   FM 1 PCA9555 (U0201) 0x42     PASSED
1 2   FM 1 ADT7462 (U0202) 0xB8     PASSED

Fan Module  0
Bus  Device                Address  Results
=========================================
1 3  FM 0 FRUID   (U0203) 0xAC      PASSED
1 3  FM 0 PCA9555 (U0201) 0x42      PASSED
1 3  FM 0 ADT7462 (U0202) 0xB8      PASSED

6 Disk Backplane
Bus  Device              Address  Results
=========================================
1 4  BP MAX7313 (U1801) 0x44      PASSED
1 4  BP FRUID (U2102)   0xAC      PASSED

Paddle Card
Bus    Device            Address  Results
=========================================
1 4    EXP FRUID (U0401) 0xAE      PASSED
<DIAGS> PHY #0 R/W Test ...        PASSED
<DIAGS> PHY #0 Link Status ...     PASSED
<DIAGS> ETHERNET PHY #0, Internal Loopback Test ... PASSED
<DIAGS> USB 1.1 Test ...           PASSED
<DIAGS>Access to BIOS Flash ...    PASSED
<DIAGS> Testing PowerCPLD version ...PASSED
Booting linux in 3 seconds...
```

U-Boot Quick Mode– Test Output Sample

This example is a sample output of a U-Boot test after it ran in -Quick mode.

EXAMPLE 2 U-Boot Quick Mode– Test Output Sample

```
U-Boot 1.1.4

Custom AST2100 U-Boot 2.0 (Jan 26 2009 - 10:29:26) r41480
DRAM:  119 MB

Flash bank 0 at 10000000 has 0x2000000 bytes in 256 sectors (chipSize 1<<25, size_ratio
1).

Flash: 32 MB

readonly: ethaddr=00:14:4F:CA:B5:10
```

EXAMPLE 2   U-Boot Quick Mode– Test Output Sample   *(Continued)*

```
readonly: eth1addr=00:14:4F:CA:B5:11

VUART1 already enabled at port 0x03f8, SerIRQ[4] rise

Protecting U-Boot flash sectors; monitor_base=100a0000.
Negating BIOS_TOP_BLOCK_LOCK signal.

H/W: <product_name> Service Processor; SOC: AST2100 Rev. 02 ('A3')
PWC_SP_Broken_OD = 0;  ARM restart caused by: watch-dog ExtRst# pin
The host is OFF(S5) (hostWantsPwr=0, powerGood=0,
allowPwrOn=0|0, outOfReset=0, fatalError=0).
Reset straps=0x88819180, def. H-PLL=264 MHz, CPU/AHB=2:1, boot CS0# normal speed
PCI w/VGA noVBIOS;  DRAM clock is M-PLL: 264 MHz (DDR2-528)
DRAM: 128MB data - 8MB VGA, 32-bit noECC, 2 BA 10 CA, CL=4 BL=4 ap=1, 61440 us refr

Board Revision - cc
Net:   faradaynic#0, faradaynic#1
Enter Diagnostics Mode ['q'uick/'n'ormal(default)/e'x'tended(manufacturing mode)].....0

Diagnostics Mode - QUICK

<DIAGS> Memory Data Bus Test ... PASSED
<DIAGS> Memory Address Bus Test ... PASSED
<DIAGS> PHY #0 R/W Test ... PASSED
<DIAGS> PHY #0 Link Status ... PASSED
<DIAGS> Testing PowerCPLD version ... PASSED
Booting linux in 3 seconds...
```

U-Boot Extended Mode– Test Output Sample

This example is a sample output of a U-Boot test after it ran in -Extended mode.

EXAMPLE 3   U-Boot Extended Mode-Test Output Sample

```
U-Boot 1.1.4

Custom AST2100 U-Boot 2.0 (Jan 26 2009 - 10:29:26) r41480

DRAM:  119 MB
Flash bank 0 at 10000000 has 0x2000000 bytes in 256 sectors
(chipSize 1<<25, size_ratio 1).Flash: 32 MB

readonly: ethaddr=00:14:4F:CA:B5:10
readonly: eth1addr=00:14:4F:CA:B5:11

VUART1 already enabled at port 0x03f8, SerIRQ[4] rise

Protecting U-Boot flash sectors; monitor_base=100a0000.

Negating BIOS_TOP_BLOCK_LOCK signal.

H/W: <product_name> Service Processor; SOC: AST2100 Rev. 02 ('A3')
  PWC_SP_Broken_OD = 0;  ARM restart caused by: watch-dog ExtRst# pin
```

EXAMPLE 3   U-Boot Extended Mode-Test Output Sample   *(Continued)*

```
  The host is OFF(S5) (hostWantsPwr=0, powerGood=0,
  allowPwrOn=0|0, outOfReset=0, fatalError=0).
  Reset straps=0x88819180, def. H-PLL=264 MHz, CPU/AHB=2:1, boot CS0# normal speed
  PCI w/VGA noVBIOS;  DRAM clock is M-PLL: 264 MHz (DDR2-528)
  DRAM: 128MB data - 8MB VGA, 32-bit noECC, 2 BA 10 CA, CL=4 BL=4 ap=1, 61440 us refr

Board Revision - cc

Net:    faradaynic#0, faradaynic#1
Enter Diagnostics Mode ['q'uick/'n'ormal(default)/e'x'tended(manufacturing mode)]..... 0

Diagnostics Mode - EXTENDED(Manufacturing Mode)

<DIAGS> Memory Data Bus Test ... PASSED
<DIAGS> Memory Address Bus Test ... PASSED
<DIAGS> Testing 0MB to 24MB (TEXT_BASE - 7 MB) ... PASSED
<DIAGS> Testing 32MB (TEXT_BASE + 1MB) to 128MB ... PASSED
<DIAGS> Flash ID Test - Flash Bank 1 ... PASSED
<DIAGS> Testing Watchdog ... PASSED

I2C Probe Test - Motherboard

Bus     Device      Address      Results
==========================================

1     Temp. Sensor(LM75) (U3006)          0x90      PASSED
2     Sys FRUID (U3003)             0xA0     PASSED
2     Power CPLD (U3301)           0x4E      PASSED
2     CPU0 Fault LED's (U3001)          0x40      PASSED
2     CPU1 Fault LED's (U3002)            0x42      PASSED
2     PCA9555 (Misc) (U3005)          0x44      PASSED
2     DIMM IMAX (U3102)          0x12     PASSED
6     Bank Panel Led's (U2701)          0xC6 PASSED
6     DS1338(RTC) ( U803)          0xD0      PASSED

I2C Probe Test - Chassis (2U)

Bus     Device      Address      Results
==========================================
PDB Board

1     PCA9548 Mux (U0202)          0xE0       PASSED
1     PDB FRUID (U0203)          0xAA     PASSED
1     MAX7313 (U0201)          0x40     PASSED

Power Supply 0

Bus     Device      Address      Results
==========================================

1   0     PS 0 FRUID   ( - )          0xAC      PASSED
1   0     PS 0 CTRL    ( - )          0x7C       PASSED

Power Supply 1

Bus     Device      Address      Results
```

EXAMPLE 3 U-Boot Extended Mode-Test Output Sample   *(Continued)*

```
===========================================
1    1      PS 1 FRUID   ( - )          0xAC      PASSED
1    1      PS 1 CTRL    ( - )          0x7C      PASSED

Fan Module  1

Bus    Device     Address     Results
===========================================

1    2      FM 1 FRUID  (U0203)            0xAC       PASSED
1    2      FM 1 PCA9555 (U0201)           0x42       PASSED
1    2      FM 1 ADT7462 (U0202)           0xB8       PASSED

Fan Module  0

Bus    Device     Address     Results
===========================================

1    3      FM 0 FRUID  (U0203)            0xAC       PASSED
1    3      FM 0 PCA9555 (U0201)           0x42       PASSED
1    3      FM 0 ADT7462 (U0202)           0xB8       PASSED

16 Disk Backplane

Bus    Device     Address     Results
===========================================

1    4      BP MAX7313 (U1801) 0x44      PASSED
1    4      BP FRUID (U2102)         0xAC      PASSED
Paddle Card
Bus    Device     Address     Results
===========================================

1    4      EXP FRUID (U0401)           0xAE       PASSED

<DIAGS> PHY #0 R/W Test ... PASSED
<DIAGS> PHY #0 Link Status ... PASSED
<DIAGS> ETHERNET PHY #0, Internal Loopback Test ... PASSED
<DIAGS>Testing RTC ... PASSED
<DIAGS> USB 1.1 Register Test ... PASSED
<DIAGS> USB2.0 Register Test ... PASSED
<DIAGS> USB 1.1 Test ... PASSED
<DIAGS>Access to BIOS Flash ... PASSED

CPU0 D0 ... Not Present
CPU0 D1 ... Not Present
CPU0 D2 ... Present

DIAGS>Verifying DIMM SPD Checksum on CPU0 D2 ... PASSED
SDRAM DEVICE                  DDR3 SDRAM
SDRAM SIZE              2 GB
NUMBER OF ROWS & COLUMNS                  14 Row x 11 Column
CYCLE TIME            DDR3 533Mhz clock(1066data rate)
MANUFACTURER_JEDEC_ID_CODE               Micron
MANUFACTURED DATE                 Week 18 of '08
```

EXAMPLE 3   U-Boot Extended Mode-Test Output Sample   *(Continued)*

```
MODULE SERIAL NUMBER                    EA09445A
MODULE_PART_NUMBER                      18JSF25672PY-1G1D

CPU0 D3 ... Not Present
CPU0 D4 ... Not Present
CPU0 D5 ... Not Present
CPU0 D6 ... Not Present
CPU0 D7 ... Not Present
CPU0 D8 ... Not Present
CPU1 D0 ... Not Present
CPU1 D1 ... Not Present
CPU1 D2 ... Present

<DIAGS>Verifying DIMM SPD Checksum on CPU1 D2 ... PASSED
SDRAM DEVICE                    DDR3 SDRAM
MODULE TYPE                     RDIMM
SDRAM SIZE                 2 GB
NUMBER OF ROWS & COLUMNS                     14 Row x 11 Column
CYCLE TIME                DDR3 533Mhz clock(1066data rate)
MANUFACTURER_JEDEC_ID_CODE            Micron
MANUFACTURED DATE                 Week 18 of '08
MODULE SERIAL NUMBER                    EA09445B
MODULE_PART_NUMBER                      18JSF25672PY-1G1D

CPU1 D3 ... Not Present
CPU1 D4 ... Not Present
CPU1 D5 ... Not Present
CPU1 D6 ... Not Present
CPU1 D7 ... Not Present
CPU1 D8 ... Not Present

<DIAGS> Testing PowerCPLD version ... PASSED
Booting linux in 3 seconds...
```

Sample SP Environmental Variables Showing U-Boot Test Status

A -Failed or -Passed status of the last U-Boot test performed on the server is stored in the SP environmental variables. To view this status from the Diagnostic mode, use the U-Boot showenv command. A sample output of the environmental variables showing the status of a U-Boot test is provided in this example.

EXAMPLE 4   Sample SP Environmental Variables With U-Boot Test Status

```
preboot> uboot
WARNING: Will reboot after 300 seconds of idle time.
=> showenv
bootcmd=bootpkg
bootdelay=10
loads_echo=1
```

EXAMPLE 4 Sample SP Environmental Variables With U-Boot Test Status   *(Continued)*

```
autoload=no
number_of_loops=1
netretry=no

update_flash=protect off all; erase 100a0000 ${flash_top}; tftp 100a0000 ${bootfile};
setenv preserve_conf no; saveenv
update_uboot=protect off all; erase 100a0000 100fffff; tftp 100a0000 ${ubootfile}
erase_perm=protect off all; cp.b 10000000 42000000 20000; erase 10000000 1001ffff;
cp.b 42000000 10000000 18000
bootfile=nightly-virgo-rom.flash

netmask=255.255.255.0
ipaddr=10.8.185.77
serverip=129.148.40.42
gatewayip=10.8.185.254

ubootfile=/tftpboot/sm158724/virgo-u-boot.bin
flash_top=11ffffff
ethact=faradaynic#0
diags_result=Diags .. PASSED
preserve_users=no
preserve_conf=yes
set_factory_defaults=no
serial_is_host=0
upgrade_bios=yes
baudrate=9600
ethaddr=00:14:4F:CA:16:0A
eth1addr=00:14:4F:CA:16:0B
stdin=serial
stdout=serial
stderr=serial
i2c_bus=2
```

Pc-Check Diagnostics Utility

This section explains how to use the Pc-Check diagnostics utility. If you are having a problem with your system, use the DOS-based Pc-Check utility to troubleshoot and solve the problem.

Pc-Check is integrated into the service processor (SP) firmware, enabling you to access the software through your server's ILOM command-line interface (CLI) or web interface. If your server does not contain an SP, you can install and access the Pc-Check utility from your server Tools and Drivers CD/DVD (see "Accessing the Pc-Check Diagnostics Utility on the Tools and Drivers CD/DVD" on page 55).

Note – Your server Tools and Drivers CD/DVD typically is shipped as part of the server Documentation and Media kit.

Topics contained in this section include:

Pc-Check Diagnostics Overview

Pc-Check is an operating system (OS) agnostic package and therefore does not require a running OS as a prerequisite. This has the advantage of not requiring a significant amount of a system's operations to diagnose problems. The diagnostic utility is integrated into the ILOM firmware to supply you with an always on-site and on-system diagnostic solution for your server. Pc-Check is designed to detect and test all motherboard components, ports, and slots.

You can execute Pc-Check directly from the host server if the server contains an SP. If your server does not contain an SP, you can execute Pc-Check from the server Tools and Drivers CD/DVD. Pc-Check has four operating modes that you can run either through the ILOM web interface or through the ILOM CLI. These modes are as follows:

- Enabled– Select this mode if you want to run Pc-Check diagnostic tests upon startup of the host. Run this mode prior to a mission-critical application to ensure the quality of the system. This mode runs a predefined test suite without user intervention and, upon completion continues to boot the next device based on the BIOS Boot Priority List. This mode is also recommended as a quick test for first-time field installation.

- Extended– Select this mode if you want to run extended Pc-Check diagnostic tests upon startup of the host. Run this mode for first-time installation of the system. This mode runs a comprehensive test suite to ensure that the system was transported without physical damage. Run this mode any time you physically change the system configuration to ensure that newly added components are installed correctly prior to running production operating systems and applications.

- Manual– Select this mode if you want to run select Pc-Check diagnostic tests upon startup of the host. You can use this mode to select individual tests from the Pc-Check menus, or to select predefined test suites available through the Immediate Burn-in test menu.

- Disabled– Select this mode if you do not want to run Pc-Check diagnostic tests upon startup of the host. This is the default mode when your system arrives. You should set Pc-Check to Disabled mode when you have concluded running the diagnostics.

Accessing Pc-Check Diagnostics Utility

To access the Pc-Check diagnostics utility, see the following sections:

-
-

▼ How to Access Pc-Check Through the ILOM Web Interface

1 **Determine the current IP address of the ILOM SP from one of the following locations:**

- CLI command– The SP has a serial port to which you can attach a terminal device. If you log in to the SP and enter the CLI command `show /SP/network`, the SP displays the current IP address.

- System BIOS Setup screen– Press F2 during power-on, then choose Advanced > IPMI 2.0 Configuration > Set LAN Configuration > IP Address.

2   Connect to the ILOM SP through a web browser running on a remote system.

To establish a connection to the ILOM SP web interface, type the IP address of the ILOM SP in the browser locator box and press Enter.

3   Log in to the ILOM web interface using your user name and password.

4   Select Remote Control > Diagnostics.

The Diagnostics page appears.

5   From the Run Diagnostics on Boot drop-down list, select one of the following options to run during startup and click Save:

- Disabled
- Enabled
- Extended
- Manual

6   Select the Remote Power Control tab.

The Remote Power Control page appears.

7   From the Select Action drop-down list, select Power Cycle and click Save to reboot the server.

Note – Pc-Check diagnostics do not boot unless Power Cycle is selected. Selecting Reset does not boot Pc-Check diagnostics.

If you chose the Enabled option, basic diagnostics are run, which takes about 3 minutes to complete. If you chose the Extended option, detailed diagnostics are run, which takes about 30 minutes to complete. If you chose the Manual option, the system boots to the Pc-Check main menu. The following main menu options appear:

- System Information Menu

- Advanced Diagnostics Tests

- Immediate Burn-in Testing

- Deferred Burn-in Testing

- Create Diagnostic Partition

- Show Results Summary

- Print Results Report

- About Pc-Check

- Exit to DOS

    To run a specific hardware component test, select **Advanced Diagnostics Test**. To run one of the test scripts supplied by Oracle, select **Immediate Burn-in Testing**.

Navigate through the menu items by pressing the arrow keys to move to a menu selection. Press the Enter key to select a menu selection, and press the ESC key to exit a menu. Navigation instructions are shown at the bottom of each screen.

▼ How to Access Pc-Check Through the ILOM CLI

1   Attach a terminal device to the serial port on the server.

Alternatively, you can use SSH to open a network CLI session to the ILOM SP IP address.

2   Log in to the server SP and enter one of the following commands:

- `-> set /SP/diag state=manual`
- `-> set /SP/diag state=enabled`
- `-> set /SP/diag state=extended`
- `-> set /SP/diag state=disabled`

3   Power-cycle the host and at the CLI prompt enter the following commands:

`-> stop /SYS`

`-> start /SYS`

If you chose the Enabled option, basic diagnostics are run, which takes about 3 minutes to complete. If you chose the Extended option, detailed diagnostics are run, which takes about 30 minutes to complete. If you chose the Manual option, the system boots to the Pc-Check main menu. The following main menu options appear:

- System Information Menu
- Advanced Diagnostics Tests
- Immediate Burn-in Testing
- Deferred Burn-in Testing
- Create Diagnostic Partition
- Show Results Summary
- Print Results Report
- About Pc-Check
- Exit to DOS

To run a specific hardware component test, select Advanced Diagnostics Test. To run one of the test scripts supplied by Oracle, select Immediate Burn-in Testing.

Navigate through the menu items by pressing the arrow keys to move to a menu selection. Press the Enter key to select a menu selection, and press the ESC key to exit a menu. Navigation instructions appear at the bottom of each screen.

System Information Menu

The System Information menu provides several options that you can choose to view information about the system.

System Information Menu Options

The following table describes each option in the System Information menu.

Option	Description
System Overview	Includes basic information about your system, motherboard, BIOS, processor, memory cache, drives, video, modem, network, buses, and ports.
Hardware ID Image	Enables you to create a document showing information about your system, including comparisons between the updates and the newest versions of your system. XML is the format used to create and display this information; however, you can also choose a text (.txt) format.
System Management Information	Provides information obtained from the system about the BIOS type, system, motherboard, enclosure, processors, memory modules, cache, slots, system event log, memory array, memory devices, memory device mapped addresses, and system boot.
PCI Bus Information	Includes details about specific devices from pci-config space within the system, similar to the System Management Information option.
IDE Bus Information	Shows the master/slave devices on the primary and secondary IDE controllers.
PCMCIA/CardBus Information	Might not be relevant to all servers.
Interrupt Vectors	Lists and details device interrupt vector information.
IRQ Information	Shows hardware interrupt assignments.
Device Drivers	Shows device drivers loaded under Open DOS.
APM Information	Tests the Advanced Power Management (APM) capabilities of the system. You can choose to change the power state, view the power status, indicate CPU usage, get a power management (PM) event, or change the interface mode.

Option	Description
I/O Port Browser	Shows the I/O port assignments for the hardware devices on the system.
Memory Browser	Enables you to view the mapped memory for the entire system.
Sector Browser	Reads sector information from the hard disks and DVD disks sector by sector.
CPU Frequency Monitor	Tests the processor speed.
CMOS RAM Utilities	Shows the CMOS settings of the system.
SCSI Utilities	Might not be relevant to all servers.
Text File Editor	Opens a text file editor.
Startup Options	Enables you to set up options for diagnostic testing.

Advanced Diagnostics Tests

Advanced Diagnostics tests are available to run tests on a range of hardware components.

This section contains the following topics:

-
-

Advanced Diagnostics Tests Menu Options

The following table gives the name and a brief description of each option in the Advanced Diagnostics Tests menu.

Option	Description
Processor	Details information about the processor, and includes a Processor Tests menu to test the processor on the system.
Memory	Details information about the memory, and includes a Memory Tests menu to test the memory on the system. Also lists each type of memory in the system, such as system, cache, or video memory.

Option	Description
Motherboard	Details information about the motherboard, and includes a Motherboard Tests menu to test the motherboard on the system.
Floppy Disks	Details information about the floppy disk drives.
Hard Disks	Details information about the hard disk, and includes a Hard Disk Tests menu to test hard disks on the system. Refer to "How to Test the Server's Hard Disks" on page 42, for detailed information about testing hard disks and script information.
CD-ROM/DVD	Includes a CD-ROM/DVD menu to test DVD devices on the system.
ATAPI Devices	Details information about devices attached to the IDE controllers on the system other than a DVD or hard disks (for example, zip drives).
TPM	Verifies proper operation of the SP trusted platform module (TPM) security chip.
Serial Ports	Details information about the serial port, and includes a Serial Ports Tests menu to test serial ports on the system. For the Serial Port test to pass, the COM1 entry in the BIOS Setup screen must be set to "System." The use of a serial port loopback connector might also be required.
Parallel Ports	Might not be relevant to all servers.
Modems	Might not be relevant to all servers.
ATA	Includes an ATA (advanced technology attachment) test menu.
USB	Details information about the USB devices on the system, and includes a USB Tests menu to test the USB.
FireWire	Might not be relevant to all servers.
Network	Performs network register controller tests.
System Stress Test	Runs a concurrent series of tests to form a stress test. The default duration setting is 20 minutes.
Keyboard	Includes a Keyboard Tests menu with options for performing different tests on the keyboard.
Mouse	Details information about the mouse, and includes a menu to test the mouse on the system.

Option	Description
Joystick	Might not be relevant to all servers.
Audio	Might not be relevant to all servers.
Video	Details information about the video card. Initially, the monitor might flicker, but then a Video Test Options menu opens and enables you to perform various video tests.
Printers	Might not be relevant to all servers.
Firmware - ACPI	Details information about Advanced Configurable Power Interface (ACPI), and includes an ACPI Tests menu to test ACPI.

▼ How to Test the Server's Hard Disks

To test the server's hard disks, follow these steps:

1   From the Pc-Check main menu, choose Advanced Diagnostics Tests.

2   From the Advanced Tests Diagnostics menu, choose Hard Disks.

3   From the Select Drive menu, choose the hard disk you want to test.

The Hard Disk Diagnostics window opens, showing both the information for the hard disk you have selected and the Hard Disk Tests menu.

The Hard Disk Tests menu displays the following options:

- Select Drive
- Test Settings
- Read Test
- Read Verify Test
- Non-Destructive Write Test
- Destructive Write Test
- Mechanics Stress Test
- Internal Cache Test
- View Error Log
- Utilities Menu
- Exit

Two types of tests are provided:

- **Media tests**– Used to test the media associated with the hard disk drive hardware, such as the physical disk. Media testing options include the Read Test, the Read Verify Test, the Non-Destructive Write Test, and the Destructive Write Test.

> ⚠️ **Caution –** Running the Destructive Write Test destroys any data that is on the disk.

- **Device tests**– Used to test non-media-related devices associated with the hard disk drive hardware, such as the head and internal cache. Device testing options include the Mechanics Stress Test and the Internal Cache Test.

In addition to choosing any of media or device test options, you can also define several parameters of the test by changing the parameters within the Test Settings option. Test Settings options include the following:

- **Media Test Settings**– Enables you to select the test time duration, the percentage of the hard disk to test, and the sectors to be tested on the hard disk.
- **Device Test Settings**– Enables you to select the test time durations of the devices and the test level.
- **Number of Retries**– Enables you to select the number of times to retry testing a device before terminating the test.
- **Maximum Errors**– Enables you to select the number of errors allowed before terminating the test.
- **Check SMART First**– SMART stands for Smart Monitoring Analysis Reporting Technology. Enables you to run a SMART test that provides automatic monitoring and problem reporting of the disk drive's health.
- **HPA Protection**– HPA stands for Host Protected Area. Enables you protect the Host Protected Area of the disk drive.
- **Exit**– Enables you to exit the Test Settings option menu.

Immediate Burn-In Testing

This section describes how to use the Pc-Check Immediate Burn-in Testing to run burn-in test scripts on your server. Immediate Burn-in Tests include full system-level tests and component-level tests. You can use predefined tests or you can create and run your own tests.

- "Full System Tests" on page 43
- "Component Tests" on page 45
- "How to Run Immediate Burn-in Tests" on page 46

Full System Tests

Three scripts have been created for testing your system during Manual mode operations:

> **Note –** Each of these scripts tests the operating status of your entire system. If you want to test only a certain percentage of your system's hard drives, see "How to Test the Server's Hard Disks" on page 42 to change the test options.

- `quick.tst`– This script performs a high-level test of all hardware components, including those components that require user input and a more in-depth memory test. You must interact with the Pc-Check utility to progress through these interactive tests. The tests cannot be run unattended and do not contain timeout facilities. The interactive tests wait until you provide the correct input.

- `noinput.tst`– This script is used as a first triage of any hardware-related problems or issues. The script performs a high-level test of most hardware components, excluding those components that require user input (keyboard, mouse, sound, video). This test does not require user input.

- `full.tst`– This script performs the most detailed and comprehensive test on all hardware components, including those components that require user input. This script contains a more in-depth memory test than `quick.tst`, as well as external port tests (which might require loopback connectors). You must interact with the test utility to progress through these interactive tests.

> **Note –** The memory tests in Pc-Check detect single-bit Error-Correcting Code (ECC) memory failures and report them down to an individual DIMM.

When you select the Immediate Burn-in Testing menu option, the Continuous Burn-in Testing screen appears. The screen includes the list of options shown in the following table for running the tests. When a `quick.tst`, `noinput.tst`, or `full.tst` script is loaded, the defaults indicated in the third column are automatically loaded.

Option	Default-General	Default Using `quick.tst`, `noinput.tst`, or `full.tst` Script	All Possible Choices
Pass Control	Overall Time	Overall Passes	Individual Passes, Overall Passes, or Overall Time
Duration	01:00	1	Any number to designate the time duration of the test
Script File	N/A	`quick.tst`, `noinput.tst`, or `full.tst`	`quick.tst`, `noinput.tst`, or `full.tst`
Report File	None	None	User-defined

Option	Default-General	Default Using quick.tst, noinput.tst, or full.tst Script	All Possible Choices
Journal File	None	D:\noinput.jrl, D:\quick.jrl, or D:\full.jrl	User-defined
Journal Options	Failed Tests	All Tests, Absent Devices, and Test Summary	Failed Tests, All Tests, Absent Devices, and Test Summary
Pause on Error	N	N	Y or N
Screen Display	Control Panel	Control Panel	Control Panel or Running Tests
POST Card	N	N	Y or N
Beep Codes	N	N	Y or N
Maximum Fails	Disabled	Disabled	1-9999

Component Tests

There are also several tests that can be performed on individual components. Each test is a continuous loop that last 6 minutes.

The following scripts are available for testing specific components:

- cdrom.tst– Tests the CD-ROM in the system.
- cpu.tst– Tests all CPUs in the system.
- hdisk$x$.tst– Tests hard disk x in the system. Where x is the number of the hard drive that you are testing (1...16).

Note – The default time for the actual hard disk test is 10 minutes.

- mboard.tst– Tests the motherboard in the system.
- video.tst– Tests the video adapter in the system.

▼ How to Run Immediate Burn-in Tests

To load one of the scripts available to test the devices on your system, follow these steps:

1 From the Pc-Check main menu, choose Immediate Burn-in Testing.

The top portion of the window lists the options described in "Full System Tests" on page 43, and the bottom portion of the window lists the Immediate Burn-in menu options.

2 Select one of the following options:

- **Load Burn-in Script**

  A text box appears.

  To use a pre-written test– Enter one of the following: **quick.tst**, **noinput.tst**, or **full.tst**

  To use a script that you created and saved– Enter **d:***testname***.tst,** where *testname* is the name of the script that you have created.

- **Change Options**

  Opens the Burn-in Options menu, which enables you to modify options for the currently loaded test script.

- **Select Tests**

  Opens a listing of the tests available for your server configuration and the currently loaded test script.

3 Select Perform Burn-in Tests.

Runs the currently loaded burn-in test script.

Deferred Burn-In Testing

You can use the Deferred Burn-in Testing option to create and save your own scripts to run at a later time.

▼ How to Create and Save Scripts for Deferred Burn-in Testing

To create and save scripts for deferred burn-in testing, follow these steps:

1 From the Pc-Check main menu, choose Deferred Burn-in Testing.

The top portion of the window lists the options described in "Full System Tests" on page 43, and the bottom portion of the window lists the Deferred Burn-in menu options.

2   Select one of the following options:

- **Change Options**

   Opens the Burn-in Options menu, which enables you to modify the various options listed in "Full System Tests" on page 43 for the currently loaded test script.

- **Select Tests**

   Opens a listing of all the possible types of tests available for you to run for the currently loaded test script.

3   When you are finished, select Save Burn-in Script and type the name for the new script.

Enter **d:***testname***.tst**, where *testname* is the name of the script that you created.

4   To run the newly created script, go to Immediate Burn-in Testing and run the script.

See "Immediate Burn-In Testing" on page 43.

Create Diagnostic Partition

The diagnostic partition is used to store log files from Pc-Check diagnostic tests. In addition, you also can copy Pc-Check files to the diagnostic partition and run Pc-Check from the partition.

Create Diagnostic Partition Menu Option

Use the Create Diagnostic Partition menu option to install a diagnostic partition on the first bootable disk seen by the server. The first bootable disk is on the primary hard drive (HD) device.

If you are running the Pc-Check diagnostics utility from a PXE server, you do not need to follow the steps in these procedures for inserting the Tools and Drivers CD/DVD into the CD/DVD drive. See"How to Set Up the Tools and Drivers CD/DVD Image on the PXE Server" on page 57.

The following sections explain how to create and access the diagnostic partition on the server:

- "How to Remove Existing Partitions From a Hard Disk" on page 48
- "How to Add a Diagnostic Partition to the First Bootable Disk" on page 49
- "How to Create a Log File on the Diagnostic Partition" on page 49
- "How to Access the Diagnostic Partition on a Red Hat Linux System" on page 50
- "How to Access the Diagnostic Partition on the Oracle Solaris 10 Operating System" on page 51
- "How to Access the Diagnostic Partition on the Windows Server 2003 Operating System" on page 52

▼ How to Remove Existing Partitions From a Hard Disk

The Create Diagnostic Partition option creates a diagnostic partition on a hard disk only if that hard disk is completely free of any partitions. Delete any existing partitions from a hard disk if you plan to use the hard disk to create a diagnostic partition on it.

⚠ **Caution –** Removing all hard disk partitions destroys all data on the disk.

You can remove existing partitions from the hard disk in the following ways:

- Use the Erase Primary Boot Hard Disk utility (Option 3 on the Tools and Drivers CD/DVD main menu).
- Use the following procedure:

1 **Insert the Tools and Drivers CD/DVD into the DVD tray.**

2 **Reboot the server.**

3 **From the Tools and Drivers CD/DVD main menu, type 3 to exit to DOS.**

4 **Type fdisk at the command prompt, and press the Enter key.**

5 **Type 4 to select an alternate fixed disk.**

The second hard disk as seen from fdisk is the first bootable disk of the system. The first hard disk as seen from fdisk is the bootable Tools and Drivers CD/DVD.

⚠ **Caution –** When performing the following tests, be careful not to delete any operating system partitions that you want to keep. Removing hard disk partitions destroys all data on the disk.

6 **Type 2 to delete the DOS partition.**

7 **Type 1 or 2 depending on the type of partition you want to delete.**

8 **Type the number of the partition you want to delete.**

9 **Type Y to erase the data and the partition.**

10 **Repeat Step 6 through Step 9 until all partitions have been deleted.**

11 **Press the Esc key to exit, and press any key to reboot the server.**

▼ How to Add a Diagnostic Partition to the First Bootable Disk

Pc-Check can view only the first or second hard disk on the system from the boot loader. The software automatically installs the diagnostic partition on the first bootable disk.

To add the diagnostic partition on the first bootable disk, follow these steps:

1 Insert the Tools and Drivers CD/DVD into the DVD tray.

2 Reboot the server.

3 At the Tools and Drivers CD/DVD main menu, type 1 to run Hardware Diagnostics.

4 From the Hardware Diagnostics main menu, choose Create Diagnostic Partition.

- If the first bootable disk is clear of partitions, the partitioning utility window appears. It states: "Your primary hard disk is not partitioned. Would you like to partition it now?"

- **Select Yes and press Enter.**

  A window appears, stating, "Partitioning complete. Your machine will now be restarted."

- If the first bootable disk is not clear of partitions, a window appears stating that the software is unable to create a hardware diagnostic partition because partitions already exist on the disk.

  If this happens, go to "How to Remove Existing Partitions From a Hard Disk" on page 48 to remove the partitions from the disk and then repeat Step 1 through Step 4 of this procedure.

5 Press Enter to reboot your server.

▼ How to Create a Log File on the Diagnostic Partition

All the scripts that are loadable with the hardware diagnostics utility are predefined, with logging to the diagnostic partition enabled. The names of log files correspond to the name of the script. For example, a script named `noinput.tst` creates a log file named `noinput.jrl`.

The following procedure shows an example of how to create and access a log file on the diagnostic partition for the `noinput.tst` script.

1 Insert the Tools and Drivers CD/DVD into the DVD tray.

2 Reboot the server.

3 From the Tools and Drivers CD/DVD main menu, choose 1 to run Hardware Diagnostics.

4 From the Hardware Diagnostics main menu, choose Immediate Burn-In Testing.

5 Select Load Burn-in Script.

6 Type `noinput.tst` and press Enter.

If you are using a test you have created yourself, enter **`d:\`***testname***`.tst`** into the Load Burn-in Script field, where *testname* is the name of the test you created.

7 Select Perform Burn-in Tests to run the script.

8 When the tests are complete, press the Esc key to exit the Display Results window.

9 Select Exit to DOS and press Enter.

10 At the DOS prompt, type the following:

C:> **d:**

11 Type the following to list the contents of the diagnostic partition:

D:> **dir**

The `noinput.jrl` log appears.

▼ How to Access the Diagnostic Partition on a Red Hat Linux System

1 Remove the Tools and Drivers CD/DVD from the DVD tray.

2 Reboot the server and start the Red Hat Linux operating system.

3 Log in as root (superuser).

4 Type the following command to determine whether your diagnostic partition has been configured to be mounted:

ls /diagpart

- If this command fails to list the log files created by the Pc-Check diagnostics utility, then the operating system has never been configured to mount the diagnostic partition. Continue to Step 5.
- If this command succeeds in listing the log files created by the Pc-Check diagnostics utility, the operating system has already been configured to mount the diagnostic partition. All users have read access to this partition. Only the superuser has read/write access to this partition. You have completed this procedure. Do not proceed with the following steps.

5 Insert the Tools and Drivers CD/DVD into the DVD tray.

6 When the CD is mounted, open a terminal window.

7   **Type the following command:**

cd *mountpoint***/drivers/linux/***linux_version*

where *mountpoint* is the CD mountpoint and *linux_version* is the version of Linux you have installed. For example:

cd /mnt/cdrom/drivers/linux/red_hat

8   **Type the following command to install the diagnostic partition:**

./install.sh

9   **Press Enter.**

The following lines appear if the diagnostic partition is mounted successfully:

```
Mounting Diagnostic Partition

Installation Successful
```

10 **Type the following command to list the contents of the diagnostic partition:**

ls /diagpart

▼ How to Access the Diagnostic Partition on the Oracle Solaris 10 Operating System

To access the diagnostic partition on the Solaris 10 Operating System (OS), follow these steps:

1   **Remove the Tools and Drivers CD/DVD from the DVD tray.**

2   **Reboot the machine and start the Solaris 10 OS.**

3   **Log in as root (superuser).**

4   **Type the following command to determine whether your diagnostic partition has been configured to be mounted:**

ls /diagpart

- If this command fails to list the log files created by the Pc-Check diagnostics utility, then the OS has never been configured to mount the diagnostic partition. Continue to Step 5.
- If this command succeeds in listing the log files created by the Pc-Check diagnostics utility, the OS has already been configured to mount the diagnostic partition. All users have read access to this partition. Only the superuser has read/write access to this partition. You have completed this procedure. Do not proceed with the following steps.

5   **Insert the Tools and Drivers CD/DVD into the DVD tray.**

6   **When the CD is mounted, open a terminal window.**

7   **Type the following command:**
    ```
    # cd /cdrom/cdrom0/drivers/sx86
    ```

8   **Type the following command to install the diagnostic partition:**
    ```
    # ./install.sh
    ```

9   **Press Enter.**

    The following lines appear if the diagnostic partition is mounted successfully:

    ```
    Mounting Diagnostic Partition

    Installation Successful
    ```

10 **Type the following command to list the contents of the diagnostic partition:**
    ```
    # ls /diagpart
    ```

▼ How to Access the Diagnostic Partition on the Windows Server 2003 Operating System

The Windows Server 2003 operating system does not allow you to mount a diagnostic partition. There is no way to view or gain access to the diagnostic partition if you are running Windows Server 2003 on the server.

The only way to retrieve the contents (log files) on the diagnostic partition is to attach a USB diskette drive to the server and complete the following procedure.

1   **Connect the USB diskette drive to any USB port on the server.**

2   **Insert the Tools and Drivers CD/DVD into the DVD tray.**

3   **Reboot the server.**

4   **At the Tools and Drivers CD/DVD main menu, type 3 to exit to DOS.**

5   **Type the following at the DOS command prompt:**
    ```
    C:> d:
    ```

6   **Copy the log file to the diskette.**

    For example, to copy a file named noinput.jrl to the diskette, type:

    ```
    D:> copy d:\noinput.jrl a:\
    ```

    The journal file is now saved to the diskette in the USB diskette drive.

Show Results Summary

Use the Show Results Summary menu options to view the tests that were run and the test results.

Show Results Summary Menu Options

Pass, Fail, or N/A is listed for each of the following Show Results Summary options:

- **Processor**

  This option shows the following tests conducted against the processor: Core Processor Tests, AMD64/Intel64 Core Tests, Math Co-Processor Tests– Pentium Class FDIV and Pentium Class FIST, MMX Operation, 3DNow! Operation, SSE Instruction Set, SSE2 Instruction Set, and MP Symmetry.

- **Motherboard**

  This option shows the following tests conducted against the motherboard: DMA Controller Tests, System Timer Tests, Interrupt Test, Keyboard Controller Tests, PCI Bus Tests, and CMOS RAM/Clock Tests.

- **Memory, Cache Memory, and Video Memory**

  This option shows the following tests conducted against the various types of memory: Inversion Test Tree, Progressive Inv. Test, Chaotic Addressing Test, and Block Rotation Test.

- **Input Device**

  This option shows the following tests conducted against the input device: Verify Device, Keyboard Repeat, and Keyboard LEDs.

- **Mouse**

  This option shows the following tests conducted against the mouse: Buttons, Ballistics, Text Mode Positioning, Text Mode Area Redefine, Graphics Mode Positions, Graphics Area Redefine, and Graphics Cursor Redefine.

- **Video**

  This option shows the following tests conducted against the video: Color Purity Test, True Color Test, Alignment Test, LCD Test, and Test Cord Test.

- **Multimedia**

  This option shows the following tests conducted against the multimedia components: Internal Speaker Test, FM Synthesizer Test, PCM Sample Test, CD/DVD Drive Read Test, CD/DVD Transfer (kilobytes/second), CD/DVD Transfer Rating, CD/DVD Drive Seek Test, CD/DVD Seek Time (ms), CD/DVD Test Disk Read, and CD/DVD Tray Test.

- **ATAPI Devices**

This option shows the following tests conducted against ATAPI devices: Linear Read Test, Non-Destructive Write, and Random Read/Write Test.

- **Hard Disk**

  This option shows the following tests conducted against the hard disk: Read Test, Read Verify Test, Non-Destructive Write Test, Destructive Write Test, Mechanics Stress Test, and Internal Cache Test.

- **USB**

  This option shows the following tests conducted against the USB: Controller Tests and Functional Tests.

- **Hardware ID**

  This option shows the machine ID for the system. This test is not available on some Oracle servers.

Print Results Report

You can use the Print Results Report menu option to print system diagnostic results.

Ensure that your server is connected to a printer, and then enter the required information to print the results.

About Pc-Check

You can use the About Pc-Check menu option to view general information about the Pc-Check software, including resident and nonresident components, such as mouse devices.

Exit to DOS

You can use the Exit to DOS menu option to exit Pc-Check and return to the DOS prompt.

Accessing the Pc-Check Diagnostics Utility on the Tools and Drivers CD/DVD

This section provides instructions for accessing the Pc-Check diagnostics utility that might be included on your server's Tools and Drivers CD/DVD. Use these procedures, if your server does not contain a service processor (SP).

Note – If your server contains an SP, the Pc-Check diagnostics utility is integrated with the SP firmware, enabling you to access the software through your server's ILOM command-line interface (CLI) or web interface. For information, see "How to Access Pc-Check Through the ILOM CLI" on page 38 or ."How to Access Pc-Check Through the ILOM Web Interface" on page 36

Use any of the following methods to access the Pc-Check diagnostics utility:

- "How to Access and Run Pc-Check From the Tools and Drivers CD/DVD" on page 55
- "How to Access and Run Pc-Check From a USB Device" on page 56
- "How to Set Up the Tools and Drivers CD/DVD Image on the PXE Server" on page 57
- "How to Access the Tools and Drivers CD/DVD From the Target Server" on page 59

▼ How to Access and Run Pc-Check From the Tools and Drivers CD/DVD

1 **If your server has an internal or externally attached CD/DVD drive, insert the server Tools and Drivers CD/DVD into your CD/DVD drive.**

2 **Reboot the server.**

The system boots to the server Tools and Drivers CD/DVD main menu.

3 **Type 1 to run the Pc-Check diagnostics utility.**

The system information loads, the Pc-Check Diagnostics main menu opens, and the following menu options appear:

- System Information Menu
- Advanced Diagnostics Tests

- Immediate Burn-in Testing
- Deferred Burn-in Testing
- Create Diagnostic Partition
- Show Results Summary
- Print Results Report
- About Pc-Check
- Exit to DOS

See "Pc-Check Diagnostics Utility" on page 35 for information about running the Pc-Check diagnostics utility.

▼ How to Access and Run Pc-Check From a USB Device

To access and run Pc-Check diagnostics from an attached USB device, follow these steps:

1 Create a bootable MS-DOS USB flash drive.

You can create a bootable USB flash drive using a freeware application such as BootFlashDOS 1.0.

2 Using a system that contains both a CD/DVD drive and a USB port, insert the Tools and Drivers CD/DVD into the CD/DVD drive and the bootable USB flash drive into an available USB port.

3 Copy the `diags.zip` file from the `/diagnostics` directory on the Tools and Drivers CD/DVD to the bootable MS-DOS USB flash drive.

Before continuing, unzip the contents of the diags.zip file to the USB flash drive.

4 Ensure that the USB flash drive containing the contents of the Tools and Drivers CD/DVD is inserted into an available USB port on the server.

5 Power on (or reboot) the server.

The BIOS screen appears.

6 In the BIOS screen, press F8 to specify a temporary boot device.

The Select Boot Device menu appears.

7 In the Boot Device menu, select the USB flash drive as the first boot device, then press Enter.

8 Save the changes and exit the system BIOS.

The system automatically boots to the USB flash drive.

9 Navigate to the directory containing the Pc-Check diagnostics utility. Type:

```
D:\ cd /diags
```

10   Run the Pc-Check diagnostics utility. Type:

`D:\` **`pccheck.exe /KS /HMD=10m`**

The system information loads, the Pc-Check Diagnostics main menu opens, and the following menu options appear:

- System Information Menu
- Advanced Diagnostics Tests
- Immediate Burn-in Testing
- Deferred Burn-in Testing
- Create Diagnostic Partition
- Show Results Summary
- Print Results Report
- About Pc-Check
- Exit to DOS

See "Pc-Check Diagnostics Utility" on page 35 for information about running the Pc-Check diagnostics utility.

▼ How to Set Up the Tools and Drivers CD/DVD Image on the PXE Server

If you have a server that does not have a CD/DVD drive, you can run the Pc-Check diagnostics utility from a Preboot Execution Environment (PXE) server.

Before You Begin   You need:

- Red Hat KickStart server with a CD/DVD drive

    You need the following to set up the PXE server.

    - Red Hat Enterprise Linux 3 manual at:

        http://www.redhat.com/
        docs/manuals/enterprise/RHEL-3-Manual/sysadmin-guide/

    - Red Hat Enterprise Linux 4 manual at:

        http://www.redhat.com/
        docs/manuals/enterprise/RHEL-4-Manual/sysadmin-guide/

- Server Tools and Drivers CD/DVD
- MEMDISK kernel from the SYSLINUX project. Access this kernel at:

    http://www.kernel.org/pub/linux/utils/boot/syslinux/

1   Log in to the PXE server as root (superuser).

2   Determine the directory where the Red Hat image is installed on the PXE server.

The default directory for the PXE image is usually /tftpboot/linux-install. This procedure assumes that the PXE files have been installed in this directory.

Note – If your PXE files are not installed in the /tftpboot/linux-install directory, modify the procedure as necessary.

---

3   Make a directory for the server Tools and Drivers CD/DVD contents. Type:

`# mkdir /tftpboot/linux-install/suppl_ven`

4   Insert the server Tools and Drivers CD/DVD into the PXE server, and copy the boot.img file located in the root directory of the CD/DVD to the new server supplemental directory created in Step 3. Type:

`# cp /mnt/cdrom/boot.img /tftpboot/linux-install/suppl_ven`

5   Download the MEMDISK kernel.

a. Go to the latest SYSLINUX project web site at:

http://www.kernel.org/pub/linux/utils/boot/syslinux/

b. Save the latest syslinux-*version*.zip file to your root directory

where, *version* is the latest SYSLINUX project version.

Note – Version 3.09 was the version at the time of this writing.

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6   Unzip the zip file. Type, for example:

`# unzip syslinux-3.09.zip`

7   Change to the memdisk directory. Type, for example:

`# cd /syslinux-3.09/memdisk`

8   Copy the MEMDISK kernel to the new server Tools and Drivers Directory created in Step 3. Type, for example:

`# cp /syslinux-3.09/memdisk/memdisk /tftpboot/linux-install/suppl_ven`

9   Edit the Boot Message Screen, as follows.

a. Open the boot.msg file in a text editor. Type:

`# vi /tftpboot/linux-install/msgs/boot.msg`

    b. **Type the following line after `0 -Local Machine`**

       `suppl_tau - server Tools & Drivers DVD`

    c. **Save and close the `boot.msg` file.**

10   **Edit the default PXE Configuration file as follows.**

    a. **Open the `default` file in a text editor. Type:**

       `# vi /tftpboot/linux-install/pxelinux.cfg/default`

    b. **Type the following lines after the `label0` section:**

       `label suppl_venkernel suppl_tau/memdiskappend initrd=suppl_tau/boot.img`

    c. **Save and close the `default` file.**

11   **Test the installation on the test machine.**

▼ How to Access the Tools and Drivers CD/DVD From the Target Server

Before You Begin   You need the following to run diagnostics on a target server:

- PXE server configured as described in "How to Set Up the Tools and Drivers CD/DVD Image on the PXE Server" on page 57.
- A server set up on the same network as the PXE server.

1   **Connect the server to the same network as the PXE server.**

2   **Power on (or reboot) the server.**

3   **Press the F12 key during POST.**

4   **The Boot Message Screen located on your PXE server at `/tftpboot/linux-install/msgs/boot.msg` appears on the screen.**

5   **Type `suppl_ven` at the prompt and press Enter.**

    The MEMDISK kernel and the bootable portion of the Tools and Drivers CD/DVD are downloaded to the test machine over the network and into memory.

    After downloading, the bootable portion of the Tools and Drivers CD/DVD is booted.

6   **Type 1 to run the Pc-Check diagnostics utility.**

    The Pc-Check Diagnostics main menu opens, and the following menu options appear:

- System Information Menu
- Advanced Diagnostics Tests
- Immediate Burn-in Testing
- Deferred Burn-in Testing
- Create Diagnostic Partition
- Show Results Summary
- Print Results Report
- About Pc-Check
- Exit to DOS

See "Pc-Check Diagnostics Utility" on page 35 for information about running the Pc-Check diagnostics utility.

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