

# Oracle<sup>®</sup> x86 Servers Diagnostics Guide

For Servers Supporting Oracle ILOM 3.0.x



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# Using This Documentation

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This guide contains instructions for using diagnostic applications that are common to many Oracle x86 servers.

This preface contains the following topics:

- “Product Downloads” on page vii
- “Documentation and Feedback” on page viii
- “Support and Training” on page ix

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## Product Downloads

You can find downloads for all Oracle x86 servers and server modules (blades) on My Oracle Support (MOS). On MOS, you can find two types of downloads:

- Software release bundles that are specific to a rackmount server, server module, modular system (blade chassis), or network express module (NEM). These software release bundles include Oracle Integrated Lights Out Manager (Oracle ILOM), Oracle Hardware Installation Assistant software, and other platform software and firmware.
- Standalone software that is common across multiple types of hardware. This software includes the Hardware Management Pack and Hardware Management Connectors software.

### ▼ To Download Software and Firmware

1. **Go to** (<https://support.oracle.com>).
2. **Sign in to My Oracle Support.**

3. At the top of the page, click the Patches and Updates tab.
4. In the Patches Search box, select Product or Family (Advanced Search).
5. In the Product? Is field, type a full or partial product name, for example Sun Fire X4470, until a list of matches is displayed, then select the product of interest.
6. In the Release? Is pull-down list, click the Down arrow.
7. In the window that is displayed, click the triangle (>) by the product folder icon to display the choices, then select the release of interest and click Close.
8. In the Patches Search box, click Search.  
A list of product downloads (listed as patches) is displayed.
9. Select the patch name of interest, for example Patch 10266805 for the Sun Fire X4470 SW 1.1 release.
10. In the right-side pane that is displayed, click Download.

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## Documentation and Feedback

For a description of the document set for your Oracle x86 server, see the *Getting Started Guide* that is shipped with your server and also published on the product documentation site. Go to the following URL, navigate to your product page, and click the Documentation tab:

(<http://www.oracle.com/technetwork/documentation/oracle-x86-servers-190077.html>)

Documentation	Link
All Oracle documentation	( <a href="http://www.oracle.com/documentation">http://www.oracle.com/documentation</a> )
Oracle Integrated Lights Out Manager (Oracle ILOM) 3.0	( <a href="http://www.oracle.com/pls/topic/lookup?ctx=E19860-01&amp;id=homepage">http://www.oracle.com/pls/topic/lookup?ctx=E19860-01&amp;id=homepage</a> )

You can provide feedback on this documentation at:

(<http://www.oracle.com/surveys/se.ashx?s=25113745587BE578>)

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# Support and Training

These web sites provide additional resources:

- Support (<https://support.oracle.com>)
- Training (<https://education.oracle.com>)



# Introduction to Diagnostic Tools

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This chapter introduces the diagnostic tools that are available for many Oracle x86 servers. It covers the following topics:

- [“About Diagnostic Tools” on page 1](#)
- [“Strategy for Diagnostics” on page 2](#)
- [“Diagnostic Tools for Oracle Servers” on page 4](#)
- [“Using the Diagnostic Tools to Troubleshoot a Server” on page 7](#)

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## About Diagnostic Tools

All diagnostics have the same goals—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 server’s use:

- From initial power-on to ensure that the server is stable before loading an operating system (OS)
- After the OS is running to isolate failures that might occur during run-time, or to run more exhaustive server-wide tests than can be run before an OS is installed
- As run-time tests to monitor server health

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# Strategy for Diagnostics

This section provides different strategies for diagnostics. This section contains the following topics:

- [“To Diagnose Server Problems” on page 2](#)
- [“Service Processor” on page 2](#)
- [“Standalone Package-Based Diagnostics” on page 3](#)
- [“Offline Operating System-Based Diagnostics” on page 3](#)
- [“Online Operating System-Based Diagnostics” on page 3](#)

## ▼ To Diagnose Server Problems

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

- 1. Use the firmware diagnostics to validate the Oracle Integrated Lights Out Manager (Oracle ILOM) service processor (SP) hardware.**
- 2. Given a stable SP, expand the scope and coverage using the standalone diagnostics.**
- 3. Use operating system-based diagnostics for full server-level exercises.**

For more information about each element of this approach, see the following topics:

- [“Service Processor” on page 2](#)
- [“Standalone Package-Based Diagnostics” on page 3](#)
- [“Offline Operating System-Based Diagnostics” on page 3](#)
- [“Online Operating System-Based Diagnostics” on page 3](#)

## Service Processor

The Oracle Integrated Lights Out Manager (Oracle 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 BIOS power-on self test (POST) in that it initializes devices, with minimal testing, and boots the Linux kernel.

# Standalone Package-Based Diagnostics

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

Standalone diagnostics are typically run in manufacturing environments or at a customer site during a new server installation. In this environment, the diagnostics can be run without being concerned about corrupting or destroying customer data. Standalone diagnostics are run with the assumption that there are no restrictions on resource utilization (for example, they can force CPU and/or IO boundary conditions to achieve effective testing) since the servers 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 will, as necessary, enforce encapsulation of hardware resources to prevent access by the diagnostics to ensure reliable server behavior.

Further, since the OS inherently manages server resources, exercises 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, online diagnostics are run in customer sites and cannot alter data repositories and must be careful not to over utilize server resources (for example, these diagnostics must not consume too many CPU cycles or too much network bandwidth).

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**Note** – Oracle does not expect that customers will run online OS diagnostics since those diagnostics drain compute resources and have limited effectiveness due to their inability to lock resources. The Fault Management Architecture eliminates the need for online diagnostics.

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# Diagnostic Tools for Oracle Servers

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

- “BIOS POST” on page 4
- “U-Boot” on page 4
- “Pc-Check” on page 5
- “Oracle VTS” on page 5
- “Snapshot Utility” on page 7

## BIOS POST

From the point that the host subsystem is powered on and begins executing code, BIOS code is executed. The sequence BIOS goes through from the first point that code is executed to the point that the operating system booting begins is referred to as POST—power-on self-test.

POST works in conjunction with other processes to complete initialization of the host system prior to booting. During the host initialization process, if failures occur, the failures are communicated to the Service Processor (SP) for analysis and logging. For more information, see the “Fault Management” section of the *Oracle Integrated Lights Out Manager (ILOM) 3.0 Daily Management – Concepts Guide*, located at:

(<http://download.oracle.com/docs/cd/E19860-01/index.html>)

## U-Boot

At server start-up, the U-Boot diagnostic software initializes on the server and tests aspects of the server SP prior to booting the Oracle 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 [Chapter 2](#).

For instructions on running U-Boot, see [“Running the U-Boot Diagnostic Tests”](#) on page 21.

## Pc-Check

Server diagnostics are contained in the DOS-based Pc-Check utility. This utility can be accessed from Oracle ILOM if your server contains a service processor (SP). For some products, the utility can be accessed and executed from your server Tools and Drivers 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 Oracle ILOM.

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 [Chapter 3](#).

For instructions on accessing the Pc-Check diagnostic software, see [“Accessing the Pc-Check Diagnostics Utility”](#) on page 33.

## Oracle VTS

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

Oracle VTS provides the following tests:

- CD DVD Test (`cddvdtest`)
- CPU Test (`cputest`)
- Cryptographics Test (`cryptotest`)
- Disk and Diskette Drives Test (`disktest`)
- Data Translation Look-aside Buffer Test (`dtlbttest`)
- Emulex HBA Test (`emlxttest`)
- 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 (`netlbttest`)
- Network Hardware Test (`nettest`)
- Physical Memory Test (`pmemtest`)
- QLogic Host Bus Adapter Test (`qlctest`)
- RAM Test (`ramtest`)
- Serial Port Test (`serialtest`)
- System Test (`systemtest`)
- Tape Drive Test (`tapetest`)
- Universal Serial Board Test (`usbttest`)
- Virtual Memory Test (`vmemtest`)

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

## Oracle VTS Bootable Diagnostics CD

The Oracle VTS Bootable Diagnostics CD that contains the Oracle VTS software might be a customer-orderable option for your server. You can also download Oracle VTS software from this site:

<https://support.oracle.com>

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**Note** – Oracle VTS 7.0ps2 is the minimum version supported on x86 servers.

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## Oracle VTS Documentation

For the most up-to-date information on Oracle VTS software, go to:

<http://www.oracle.com/technetwork/documentation/sys-mgmt-networking-190072.html>

For information about Oracle VTS software that is specific to your server, read the most recent Product Notes or Release Notes for your server before running Oracle VTS.

# Snapshot Utility

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

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**Note** – Do not run this utility unless requested to do so by Oracle Service personnel.

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The Oracle 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 Snapshot utility using either the Oracle ILOM command-line interface (CLI) or web interface. For instructions on running the utility, see the *Oracle Integrated Lights Out Manager (ILOM) 3.0 Daily Management – CLI Procedures Guide* or the *Oracle Integrated Lights Out Manager (ILOM) 3.0 Daily Management – Web Procedures Interface Guide*.

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## Using the Diagnostic Tools to Troubleshoot a Server

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

- “Troubleshooting Scenarios” on page 8
- “Diagnostic Test Coverage” on page 11
- “Setting Up a Server for Testing” on page 11

# Troubleshooting Scenarios

There are four basic scenarios that you will encounter during the 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 that you ordered already installed, run the diagnostic tests before placing the server into service. This way you will verify that the server is in good working order (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 needs to 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. Install the options only after determining that the server is in good working order. After installing the options, 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 tests 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 have placed the server into service and it has been operating properly for some 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 identify 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.

TABLE 1-2 provides step-by-step troubleshooting procedures.

TABLE 1-1 Troubleshooting Scenario Procedures

Troubleshooting Scenario	Do This...
<b>Scenario 1:</b> First time server installations and no server options need to be installed	<p>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:</p> <ul style="list-style-type: none"><li>• U-Boot</li><li>• Pc-Check</li></ul> <p><b>Tests failed:</b> If the above tests identify a server failure, you can assume that the server was damaged in shipment. Terminate the installation process at this point and notify Oracle Service of the problem. Taking these steps will ensure that the server is covered under warranty.</p> <p><b>Tests passed:</b> Place the server into service.</p> <p><b>Note</b> - If a network connectivity problem is experienced when placing a server into service for the first time, ensure that the network access point for the server is activated.</p>
<b>Scenario 2:</b> First time server installations and server options need to be installed	<p>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:</p> <ul style="list-style-type: none"><li>• U-Boot</li><li>• Pc-Check</li></ul> <p><b>Tests failed:</b> If the above tests identify a server failure, you can assume that the server was damaged in shipment. Terminate the installation process at this point and notify Oracle Service of the problem. Taking these steps will ensure that the server is covered under warranty.</p> <p><b>Tests passed:</b> If the above tests show the server to be in good working order, do the following before placing the server into service:</p> <p><b>Note</b> - If a network connectivity problem is experienced when placing a server into service for the first time, ensure that the network access point for the server is activated.</p> <ol style="list-style-type: none"><li>1. Install the server options that were shipped separately.</li><li>2. Run the U-Boot diagnostic tests.</li><li>3. Run the Pc-Check diagnostic tests.</li></ol>

**TABLE 1-1** Troubleshooting Scenario Procedures (Continued)

Troubleshooting Scenario	Do This...
<b>Scenario 3:</b> Upgrading a server that has been in service	<p>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.</p> <p>Follow these steps:</p> <ol style="list-style-type: none"><li>1. Take the server out of service.</li><li>2. Run the U-Boot diagnostic tests.</li><li>3. Run the Pc-Check diagnostic tests.</li><li>4. Install the server upgrade.</li><li>5. Run the U-Boot and Pc-Check diagnostic tests again.</li></ol> <p><b>Tests failed:</b> 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.</p> <p><b>Tests passed:</b> Place the server into service.</p> <p><b>Note</b> - 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.</p>
<b>Scenario 4:</b> 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	<p>Do the following:</p> <ol style="list-style-type: none"><li>1. Before opening the server's cover, inspect the server and Oracle ILOM service processor (SP) log files for obvious fault messages and any fault LEDs.</li><li>2. Inspect the server's internal components for obvious problems (burnt component, anything that would inhibit proper cooling of a server component, and so on).</li><li>3. If the visual inspection does not identify a failed component, run the U-Boot tests and then the Pc-Check diagnostic tests to identify the failed component.</li><li>4. If the above tests do not identify the failed component, run Oracle VTS.</li><li>5. If the failed component is a customer-replaceable unit (CRU), replace it. CRUs are defined in the service manual for the particular server model.</li><li>6. 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.</li></ol> <p><b>Note</b> - 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.</p>



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**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.

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## Diagnostic Test Coverage

TABLE 1-2 shows which server components are tested by the different diagnostic tests: U-Boot, Pc-Check, and Oracle VTS.

**TABLE 1-2** Server Components Tested by Diagnostics Tools

Server Components Tested	U-Boot	Pc-Check	Oracle VTS
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, see the hardware installation guide for your server.



## U-Boot Diagnostic Start-Up Tests

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

Topics contained in this chapter include:

- “U-Boot Diagnostic Start-Up Tests Overview” on page 16
  - “Server Diagnostic Test Options at Start-Up” on page 16
  - “U-Boot Diagnostic Test Modes – Normal, Quick, and Extended” on page 17
  - “Reporting of Diagnostic Failures at Server Start-Up” on page 19
- “Running the U-Boot Diagnostic Tests” on page 21
  - “Before You Begin” on page 21
  - “To Select a U-Boot Diagnostic Mode to Run at Start-Up” on page 21
- “Sample U-Boot Test Output” on page 22
  - “U-Boot Normal Mode – Test Output Sample” on page 22
  - “U-Boot Quick Mode – Test Output Sample” on page 24
  - “U-Boot Extended Mode – Test Output Sample” on page 25
- “Sample SP Environmental Variables Showing U-Boot Test Status” on page 28

---

# U-Boot Diagnostic Start-Up Tests Overview

At server start-up, the U-Boot diagnostic software initializes on your server and tests aspects of the server SP prior to booting the Oracle 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

## Server Diagnostic Test Options at Start-Up

At server start-up, a series of diagnostic tests are run on the server host and SP prior to booting the host operating system and the Oracle ILOM SP firmware. Some of these diagnostic tests are run by default, while others are optional tests that you can choose to run. To determine which start-up diagnostic tests are run by default, and which diagnostic tests are optional and are available to run, see [TABLE 2-1](#).

**TABLE 2-1** Server Diagnostic Test Options at Start-Up

Component	Start-Up Diagnostic Options	Default Test	Optional Test
Server SP	<ul style="list-style-type: none"><li>• U-Boot -Normal mode (default mode) See “U-Boot Diagnostic Test Modes – Normal, Quick, and Extended” on page 17 for further details.</li></ul>	Yes	No
	<ul style="list-style-type: none"><li>• U-Boot -Quick mode See “U-Boot Diagnostic Test Modes – Normal, Quick, and Extended” on page 17 for further details.</li></ul>	No	Yes
	<ul style="list-style-type: none"><li>• U-Boot -Extended mode See “U-Boot Diagnostic Test Modes – Normal, Quick, and Extended” on page 17 for further details.</li></ul>	No	Yes
Server Host	<ul style="list-style-type: none"><li>• BIOS power-on self-test (POST) For BIOS POST details, see your service manual for your server.</li></ul>	Yes	No
	<ul style="list-style-type: none"><li>• Pc-Check 3-minute or 30-minute test See <a href="#">Chapter 3</a> for details.</li></ul>	No	Yes

## 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 start-up.

For details about which U-Boot diagnostic tests are run for each mode, see [TABLE 2-2](#). For details about how to select one of the three U-Boot modes to run at server start-up, see “[To Select a U-Boot Diagnostic Mode to Run at Start-Up](#)” on page 21.

---

**Note** – If any of the U-Boot diagnostic tests fail during start-up, the server SP will not start. See “[Reporting of Diagnostic Failures at Server Start-Up](#)” on page 19 for additional details.

---

TABLE 2-2 describes the U-Boot diagnostics tests for each of the three diagnostic modes of operation.

**TABLE 2-2** U-Boot Component Tests at Start-Up

U-Boot Component Test	Normal	Quick	Extended	Purpose
Memory Data Bus Test	Yes	Yes	Yes	Checks for opens/shorts on SP Memory's data bus.
Memory Address Bus Test	Yes	Yes	Yes	Checks for opens/shorts on SP Memory's address bus.
Memory Data Integrity Test	No	No	Yes	Checks for data integrity on the SP Memory.
Flash Test	No	No	Yes	Checks access to Flash.
WatchDog Test	No	No	Yes	Checks the WatchDog functionality on the SP.
I2C Probe Tests*	Yes	No	Yes	Checks the connectivity to I2C devices on standby power.
Ethernet Test	Yes	Yes	Yes	Verifies ability to read from specified Ethernet port.
Ethernet Link Test	Yes	Yes	Yes	Verifies link on specified PHY.
Ethernet Internal Loopback Test	Yes	No	Yes	Verifies Ethernet functionality by sending and receiving packets.
Real Time Clock Test	Yes	No	Yes	Checks functionality of the real-time clock on the SP.
USB 1.1 Test	No	No	Yes	Checks USB 1.1 functionality.
USB 1.1 BIST	Yes	No	Yes	Runs internal USB 1.1 built-in self-test (BIST).
USB 2.0 Test	No	No	Yes	Checks USB 2.0 functionality.
BIOS Flash ID Test	Yes	No	Yes	Verifies ability to read from the BIOS flash.
Serial Presence Detect (SPD) Access Test	No	No	Yes	Verifies DIMM SPD access along with checksum and prints SPD information.
Power CPLD Test	Yes	Yes	Yes	Verifies the correct power revision of the complex programmable logic device (CPLD).

\* 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 (blade).

# Reporting of Diagnostic Failures at Server Start-Up

After U-Boot completes the diagnostic tests, the test results and a final status of the U-Boot tests are displayed on your screen. If a hardware failure is detected by U-Boot, the failure is reported in the test outputs. To view samples of the U-Boot test outputs, see [“Sample U-Boot Test Output”](#) on page 22.

---

**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 [“Sample SP Environmental Variables Showing U-Boot Test Status”](#) on page 28.

---

When troubleshooting your server, note that the symptoms of a diagnostic failure can vary depending on whether the diagnostics at start-up have failed on the server SP or host. For additional details about how to determine where the diagnostics failed at start-up and possibly locate additional information about the failure, see [TABLE 2-3](#).

**TABLE 2-3** Failure Status and Symptoms Reported for Start-Up Diagnostics

Component	Failure Status and Symptoms
Server SP (U-Boot)	<ul style="list-style-type: none"><li>• When the component failure is detected on the server SP, the failure is typically reported in the following locations:<ul style="list-style-type: none"><li>– U-Boot test results</li></ul></li></ul> <p>For sample output of U-Boot test results, see <a href="#">“Sample U-Boot Test Output” on page 22</a>.</p> <ul style="list-style-type: none"><li>– Oracle ILOM event log.</li></ul> <p>For details on how to access this log, refer to the information about the Oracle ILOM event log in the <i>Oracle Integrated Lights Out Manager (Oracle ILOM) 3.0 Daily Management -- Concepts Guide</i>.</p> <ul style="list-style-type: none"><li>– Fault Management tab in the Oracle ILOM web interface</li></ul> <p>For more details about access and use of fault management, refer to the information about Oracle ILOM fault management in the <i>Oracle Integrated Lights Out Manager (Oracle ILOM) 3.0 Daily Management -- Concepts Guide</i>. To determine which faults you must manually clear on your server, refer to the platform Oracle ILOM Supplement Administration Guide for your server.</p> <ul style="list-style-type: none"><li>• If a component failed to start, the Service Action Required LED on the front panel of the server illuminates.</li><li>• If the U-Boot diagnostic test failed, the server SP will not start.</li></ul>
Server Host (BIOS POST)	<ul style="list-style-type: none"><li>• When the component failure is detected on the server host, the failure is typically reported in the following locations:<ul style="list-style-type: none"><li>– Fault Management tab in the Oracle ILOM web interface</li></ul></li></ul> <p>For more details about access and use of fault management, refer to the information about Oracle ILOM fault management in the <i>Oracle Integrated Lights Out Manager (Oracle ILOM) 3.0 Daily Management -- Concepts Guide</i>. To determine which faults you must manually clear on your server, refer to the platform Oracle ILOM Supplement guide for your server.</p> <ul style="list-style-type: none"><li>– Oracle ILOM event log.</li></ul> <p>For details on how to access this log, refer to the information about the Oracle ILOM event log in the <i>Oracle Integrated Lights Out Manager (Oracle ILOM) 3.0 Daily Management -- Concepts Guide</i>.</p> <ul style="list-style-type: none"><li>• If a component failed at start-up, the Service Action Required LED on the front panel of the server illuminates.</li><li>• If the BIOS power-on self-test (POST) detected a fatal error, the host operating system will not start.</li></ul>

---

# 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 start-up. For further details on how to select one of the three U-Boot diagnostic modes to run at start-up, see [“To Select a U-Boot Diagnostic Mode to Run at Start-Up”](#) on page 21

## Before You Begin

All U-Boot diagnostic tests are required to run from a serial connection. You must have either a hyper terminal or a local 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 (ILOM) 3.0 Daily Management – Concepts Guide*.

## ▼ To Select a U-Boot Diagnostic Mode to Run at Start-Up

### 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 (ILOM) 3.0 Daily Management – Concepts Guide*.

### 2. Power cycle or restart 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 on how to power on or restart your server, see the installation guide for your server.

### 3. Watch for the following prompt 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 mode U-Boot tests; or let the countdown continue to run Normal mode.
- Type “**q**” to enable -Quick mode U-Boot tests.
- Type “**x**” to enable -Extended mode 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 of Diagnostic Failures at Server Start-Up”](#) on page 19 for further 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 22
- [“U-Boot Quick Mode – Test Output Sample”](#) on page 24
- [“U-Boot Extended Mode – Test Output Sample”](#) on page 25

### U-Boot Normal Mode – Test Output Sample

The following example presents a sample output of U-Boot tests that ran in -Normal mode.

```
U-Boot 1.1.4

VUART1 already enabled at port 0x03f8, SerIRQ[4] rise
Protecting U-Boot flash sectors; monitor_base=100a0000.
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
Negating BIOS_TOP_BLOCK_LOCK signal.
<DIAGS> Memory Address Bus Test ... PASSED
I2C Probe Test - Motherboard
```

```

H/W: <product_name> Service Processor; SOC: AST2100 Rev. 02 ('A3')
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
PWC_SP_Broken_OD = 0; ARM restart caused by: watch-dog ExtRst# pin
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) 0x40P ASSED
The host is OFF(S5) (hostWantsPwr=0, powerGood=0,
Power Supply 0
Bus Device Address Results
=====

1 0 PS 0 FRUID ( - ) 0xAC PASSED
1 0 PS 0 CTRL (-) 0x7C PASSED
allowPwrOn=0|0, outOfReset=0, fatalError=0).
Power Supply 1
Bus Device Address Results
=====

1 1 PS 1 FRUID (-) 0xAC PASSED
1 1 PS 1 CTRL ( - ) 0x7C PASSED
Reset straps=0x88819180, def. H-PLL=264 MHz, CPU/AHB=2:1, boot CS0# normal speed
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
PCI w/VGA noVBIOS; DRAM clock is M-PLL: 264 MHz (DDR2-528)
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

```

```

DRAM: 128MB data - 8MB VGA, 32-bit noECC, 2 BA 10 CA, CL=4 BL=4 ap=1, 61440 us
refr
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
Custom AST2100 U-Boot 2.0 (Jan 26 2009 - 10:29:26) r41480
<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...
=====
DRAM: 119 MB
1 4 EXP FRUID (U0401) 0xAE PASSED
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: ethladdr=00:14:4F:CA:B5:11

```

## U-Boot Quick Mode – Test Output Sample

The following example presents a sample output of a U-Boot test that ran in `-Quick` mode.

```

U-Boot 1.1.4

Flash: 32 MB
readonly: ethaddr=00:14:4F:CA:B5:10
Custom AST2100 U-Boot 2.0 (Jan 26 2009 - 10:29:26) r41480
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...

```

```
readonly: ethladdr=00:14:4F:CA:B5:11
DRAM: 119 MB
VUART1 already enabled at port 0x03f8, SerIRQ[4] rise
Flash bank 0 at 10000000 has 0x2000000 bytes in 256 sectors (chipSize 1<<25,
size_ratio 1).
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
```

## U-Boot Extended Mode – Test Output Sample

The following example presents a sample output of a U-Boot test after it ran in -Extended mode.

```
U-Boot 1.1.4

VUART1 already enabled at port 0x03f8, SerIRQ[4] rise
Protecting U-Boot flash sectors; monitor_base=100a0000.
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)
Negating BIOS_TOP_BLOCK_LOCK signal.
<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
```

```

H/W: <product_name> Service Processor; SOC: AST2100 Rev. 02 ('A3')
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
PWC_SP_Broken_OD = 0; ARM restart caused by: watch-dog ExtRst# pin
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
The host is OFF(S5) (hostWantsPwr=0, powerGood=0,
Power Supply 0
Bus Device Address Results
=====
1 0 PS 0 FRUID ( - ) 0xAC PASSED
1 0 PS 0 CTRL ( - ) 0x7C PASSED
allowPwrOn=0|0, outOfReset=0, fatalError=0).
Power Supply 1
Bus Device Address Results
=====
1 1 PS 1 FRUID ( - ) 0xAC PASSED
1 1 PS 1 CTRL ( - ) 0x7C PASSED
Reset straps=0x88819180, def. H-PLL=264 MHz, CPU/AHB=2:1, boot CS0# normal speed
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
PCI w/VGA noVBIOS; DRAM clock is M-PLL: 264 MHz (DDR2-528)
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

```

```

DRAM: 128MB data - 8MB VGA, 32-bit noECC, 2 BA 10 CA, CL=4 BL=4 ap=1, 61440 us
refr
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
<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
1 4 EXP FRUID (U0401) 0xAE PASSED
DIAGS>Verifying DIMM SPD Checksum on CPU0 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 EA09445A
MODULE_PART_NUMBER 18JSF25672PY-1G1D
CPU0 D3 ... Not Present
CPU0 D4 ... Not 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

```

```
CPU0 D5 ... Not Present
CPU1 D3 ... Not Present
CPU1 D4 ... Not Present
CPU1 D5 ... Not Present
CPU1 D6 ... Not Present
CPU1 D7 ... Not Present
CPU1 D8 ... Not Present
CPU0 D6 ... Not Present
Custom AST2100 U-Boot 2.0 (Jan 26 2009 - 10:29:26) r41480
<DIAGS> Testing PowerCPLD version ... PASSED
Booting linux in 3 seconds...
CPU0 D7 ... Not Present
DRAM: 119 MB
CPU0 D8 ... Not Present
Flash bank 0 at 10000000 has 0x2000000 bytes in 256 sectors(chipSize 1<<25,
size_ratio 1).
CPU1 D0 ... Not Present
Flash: 32 MB
CPU1 D1 ... Not Present
readonly: ethaddr=00:14:4F:CA:B5:10
PU1 D2 ... Present
readonly: eth1addr=00:14:4F:CA:B5:11
```

---

## 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 U-Boot tests is provided in the following example.

```
update_flash=protect off all; erase 100a0000 ${flash_top}; tftp 100a0000
${bootfile}; setenv preserve_conf no; saveenv
update_uboot=protect off all; erase 100a0000 100ffffff; tftp 100a0000
${ubootfile}
netmask=255.255.255.0
ipaddr=10.8.185.77
serverip=129.148.40.42
gatewayip=10.8.185.254
```

```
erase_perm=protect off all; cp.b 10000000 42000000 20000; erase 10000000
1001ffff; cp.b 42000000 10000000 18000
preboot> uboot
ubootfile=/tftpboot/sm158724/virgo-u-boot.bin
flash_top=11ffffff
ethact=faradaynic#0diags_result=Diags .. PASSEDpreserve_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
ethladdr=00:14:4F:CA:16:0B
stdin=serial
stdout=serial
stderr=serial
i2c_bus=2
bootfile=nightly-virgo-rom.flash
WARNING: Will reboot after 300 seconds of idle time.
=> showenv
bootcmd=bootpkg
bootdelay=10
loads_echo=1
autoload=no
number_of_loops=1
netretry=no
```



## Pc-Check Diagnostics Utility

---

This chapter explains how to use the Pc-Check diagnostics utility. If you are having a problem with your server, use the 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 the Oracle ILOM command-line interface (CLI) or web interface.

Topics contained in this chapter include:

- [“Pc-Check Diagnostics Overview”](#) on page 32
- [“Accessing the Pc-Check Diagnostics Utility”](#) on page 33
- [“System Information Menu”](#) on page 35
- [“Advanced Diagnostics Tests”](#) on page 37
- [“Immediate Burn-in Testing”](#) on page 40
- [“Show Results Summary”](#) on page 43
- [“Print Results Report”](#) on page 45
- [“About Pc-Check”](#) on page 45
- [“Exit to DOS”](#) on page 45

---

# 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 server's operations to diagnose problems. The diagnostic utility is integrated into the Oracle ILOM firmware to supply you with an always on-site and on-server 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. Pc-Check has four operating modes that you can run either through the Oracle ILOM web interface or CLI. These modes are as follows:

- **Enabled** – Select this mode if you want to run Pc-Check diagnostic tests upon start-up of the host. It is recommended that you run this mode prior to a mission-critical application to ensure the quality of the server. This mode runs a predefined test suite without user intervention and, upon completion, will continue 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 start-up of the host. It is recommended that you run this mode for first-time installation of the server. This mode runs a comprehensive test suite to ensure that the server was transported without physical damage. This mode should also be run any time you physically change the server 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 start-up 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. These tests are discussed in depth later in this document.
- **Disabled** – Select this mode if you do not want to run Pc-Check diagnostic tests upon start-up of the host. This is the default mode when your server arrives. You should set Pc-Check to Disabled mode when you have concluded running the diagnostics.

---

# Accessing the Pc-Check Diagnostics Utility

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

- “To Access Pc-Check Using the Oracle ILOM Web Interface” on page 33
- “To Access Pc-Check Using the Oracle ILOM CLI” on page 34

## ▼ To Access Pc-Check Using the Oracle ILOM Web Interface

**1. Determine the current IP address of the Oracle 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 Oracle ILOM SP through a web browser running on a remote server.**

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

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

**4. Select Remote Control → Diagnostics.**

The Diagnostics page is displayed.

**5. From the Run Diagnostics on Boot drop-down list, select one of the following options to run during start-up, then click Save:**

- Disabled
- Enabled
- Extended
- Manual

**6. Select the Remote Power Control tab.**

The Remote Power Control page is displayed.

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

Note that Pc-Check diagnostics will not boot unless Power Cycle is selected. Selecting Reset will not boot Pc-Check diagnostics.

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

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

To run a specific hardware component test, select Advanced Diagnostics Tests. 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.

## ▼ To Access Pc-Check Using the Oracle 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 Oracle 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. Type these two commands:

```
->stop /SYS
```

```
->start /SYS
```

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

- [System Information Menu](#)
- [Advanced Diagnostics Tests](#)
- [Immediate Burn-in Testing](#)
- [Deferred Burn-in Testing](#)
- [Show Results Summary](#)
- [Print Results Report](#)
- [About Pc-Check](#)
- [Exit to DOS](#)

To run a specific hardware component test, select `Advanced Diagnostics Tests`. 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.

---

## System Information Menu

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

# System Information Menu Options

TABLE 3-1 describes each option in the System Information menu.

**TABLE 3-1** System Information Menu Options

Option	Description
System Overview	Includes basic information about your server, 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 server, including comparisons between the updates and the newest versions of your server. 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 server about the BIOS type, server, motherboard, enclosure, processors, memory modules, cache, slots, server event log, memory array, memory devices, memory device mapped addresses, and server boot.
PCI Bus Information	Includes details about specific devices from <code>pci-config</code> space within the server, 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 server. 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.
I/O Port Browser	Shows the I/O port assignments for the hardware devices on the server.
Memory Browser	Enables you to view the mapped memory for the entire server.
Sector Browser	Reads sector information from the hard disks and DVD disks sector by sector.
CPU Frequency Monitor	Tests the processor speed.

**TABLE 3-1** System Information Menu Options *(Continued)*

Option	Description
CMOS RAM Utilities	Shows the CMOS settings of the server.
SCSI Utilities	Might not be relevant to all servers.
Text File Editor	Opens a text file editor.
Start-Up 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.

### Advanced Diagnostics Tests Menu Options

[TABLE 3-2](#) describes each option in the Advanced Diagnostics Tests menu.

**TABLE 3-2** Advanced Diagnostics Tests Menu Options

Option	Description
Processor	Details information about the processor, and includes a Processor Tests menu to test the processor on the server.
Memory	Details information about the memory, and includes a Memory Tests menu to test the memory on the server. Also lists each type of memory in the server, such as server, cache, or video memory.
Motherboard	Details information about the motherboard, and includes a Motherboard Tests menu to test the motherboard on the server.
Floppy Disks	Might not be relevant to all servers.
Hard Disks	Details information about the hard disk, and includes a Hard Disk Tests menu to test hard disks on the server. Refer to <a href="#">“To Test the Hard Disks of the Server” on page 39</a> , 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 server.

**TABLE 3-2** Advanced Diagnostics Tests Menu Options (*Continued*)

<b>Option</b>	<b>Description</b>
ATAPI Devices	Details information about devices attached to the IDE controllers on the server 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 server. In order 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 server, 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. Duration is set for 20 minutes by default.
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 server.
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 that 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.

## ▼ To Test the Hard Disks of the Server

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 Monitoring Analysis Reporting Technology (SMART) enables you to run a test that provides automatic monitoring and problem reporting of the disk drive's health.
- **HPA Protection** – Host Protected Area (HPA) 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

Use the Immediate Burn-in Testing menu option to run burn-in test scripts on your server. Immediate Burn-in tests include full server-level tests and component-level tests. You can use predefined tests or you can create and run your own tests.

### Immediate Burn-in Testing Menu Options

Use the Immediate Burn-in Testing menu option to run burn-in test scripts on your server.

This section includes the following topics:

- [“Full System Tests” on page 40](#)
- [“To Run Immediate Burn-in Tests” on page 42](#)

### Full System Tests

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

---

**Note** – Each of these scripts tests the operating status of your entire server. If you want to test only a certain percentage of your server's hard drives, refer to [“To Test the Hard Disks of the Server” on page 39](#) 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, as well as 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 memory module (DIMM).

---

When you select the Immediate Burn-in Testing menu option, the Continuous Burn-in Testing window is displayed. The screen includes the list of options shown in TABLE 3-3 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.

**TABLE 3-3** Test Menu Options

Option	Default – General	Default Using <code>quick.tst</code> , <code>noinput.tst</code> , or <code>full.tst</code> 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, in minutes, of the test.
Script File	N/A	<code>quick.tst</code> , <code>noinput.tst</code> , or <code>full.tst</code>	<code>quick.tst</code> , <code>noinput.tst</code> , or <code>full.tst</code>
Report File	None	None	User-defined
Journal File	None	D:\noinput.jrl, D:\quick.jrl, or D:\full.jrl	User-defined

**TABLE 3-3** Test Menu Options (Continued)

<b>Option</b>	<b>Default – General</b>	<b>Default Using quick.tst, noinput.tst, or full.tst Script</b>	<b>All Possible Choices</b>
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 Code	N	N	Y or N
Beep Codes	N	N	Y or N
Maximum Fails	Disabled	Disabled	1-9999

## ▼ To Run Immediate Burn-in Tests

To load one of the scripts available to test the devices on your server, 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 TABLE 3-3, 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 is displayed.

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

**To use a script that you have 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 the various options listed in TABLE 3-3 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.

## ▼ 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 [TABLE 3-3](#), 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 [TABLE 3-3](#) 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 done, select Save Burn-in Script and type the name for the new script.**

Enter **d:\test-name.tst** where *test-name* is the name of the script that you have 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 40.

---

## Show Results Summary

Use the Show Results Summary menu option 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 section 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 section 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 section shows the following tests conducted against the various types of memory: Inversion Test Tree, Progressive Inversion Test, Chaotic Addressing Test, and Block Rotation Test.

## ■ Input Device

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

## ■ Mouse

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

## ■ Multimedia

This section 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 (KB/Sec), 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 section shows the following tests conducted against ATAPI devices: Linear Read Test, Non-Destructive Write, and Random Read/Write Test.

## ■ Hard Disk

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

- **Hardware ID**

This section shows the machine ID for the server. This test is not available on some Oracle systems.

---

## Print Results Report

You can use the Print Results Report menu option to print server 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 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.



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