

Oracle x86 Servers Diagnostics and Troubleshooting Guide



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Preface

- **Overview** - Describes diagnostic and troubleshooting information for x86 servers with Oracle ILOM 5.1 and later
- **Audience** - Technicians, system administrators, and authorized service providers
- **Required knowledge** - Advanced experience troubleshooting and replacing hardware

Product Documentation Library

Documentation and resources for this product and related products are available at:
[Oracle X9-2 Server Documentation Library](#).

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Introduction to System Diagnostics and Troubleshooting

Oracle provides a wide spectrum of diagnostic and troubleshooting tools for use with Oracle x86 servers. These tools include integrated log file information, operating system diagnostics, and hardware LED indicators, all of which contain clues helpful in narrowing down the possible sources of a problem.

Some diagnostic tools stress the system by running tests in parallel, while other tools run sequential tests, enabling the system to continue its normal functions. Some diagnostic tools function on Standby power or when the system is offline, while others require the operating system to be up and running.

This section describes the Oracle diagnostic tools for x86 servers equipped with Oracle ILOM Firmware Releases 4.x and 5.x. It includes the following topics:

- [Diagnostic and Troubleshooting Tools](#)
- [Troubleshooting System Components](#)

Diagnostic and Troubleshooting Tools

Why are there so many different diagnostic and troubleshooting tools? There are a number of reasons for the lack of a single all-in-one diagnostic test, starting with the complexity of the server. Consider also that some diagnostics must function even when the system fails to boot. Any diagnostic capable of isolating problems when the system fails to boot must be independent of the operating system. But any diagnostic that is independent of the operating system is also unable to make use of the operating system's considerable resources for getting at the more complex causes of faults or failures. Consider the different tasks you expect to perform with your diagnostic and troubleshooting tools:

- Isolating faults to a specific replaceable hardware component
- Exercising the system to disclose more subtle problems that might or might not be hardware related
- Monitoring the system to catch problems before they become serious enough to cause unplanned downtime

You cannot optimize every diagnostic tool for all these varied tasks. Instead of one unified diagnostic tool, Oracle provides a palette of tools each of which has its own strengths and applications.

The following diagnostic and troubleshooting tools are available for your server.

Tool	Description	Link
Status indicators	Status indicators (LEDs) located on the chassis and on selected system components can serve as front-line indicators of a limited set of hardware failures.	System LEDs and Diagnostics

Tool	Description	Link
Oracle ILOM Diagnostics	Oracle ILOM displays the status of system components. You can then replace a failed component, which often clears the problem.	Oracle ILOM Diagnostics
HWdiag (Oracle ILOM Diag shell)	Oracle ILOM allows you to run HWdiag, a command-line utility that checks the status of system components. Access the <code>hwdiag</code> command from the Oracle ILOM Diag shell.	Using the Oracle ILOM Diag Shell
Snapshot Utility (Oracle ILOM)	Oracle ILOM collects information about the current state of the Oracle ILOM SP, including environmental data, logs, and information about field-replaceable units installed on the server. You also can use Snapshot to run diagnostics on the host and capture the diagnostics log files.	Using the Snapshot Utility
UEFIdiag (Oracle ILOM/UEFI shell)	Oracle ILOM allows you to run diagnostics in a UEFI environment to evaluate system components, such as the CPU, memory, disk drives, and I/O cards.	Using UEFI Diagnostics
Oracle Solaris Diagnostics	Use Oracle Solaris diagnostics to diagnose component problems and interpret the log files.	Core Dump File

Troubleshooting System Components

The following table lists the system components and shows which utility you can use to either test the components or get status information about them.

Server Component	Oracle ILOM	UEFIdiag	HWdiag
Service processor	Yes	No	Yes
CPU and memory	Yes	Yes	Yes
Fans	Yes	No	Yes
Power supplies	Yes	No	Yes
Storage devices	Yes (limited)	Yes	Yes (limited)
Network interface	Yes	Yes (limited)	Yes (limited)

System Diagnostics and Troubleshooting Strategies

This section provides strategies for using the diagnostic tools to troubleshoot your Oracle x86 server.

- [When to Run the Tools](#)
- [System Diagnostics and Troubleshooting Scenarios](#)
- [Preliminary Troubleshooting Procedures](#)

When to Run the Tools

The following table lists the suggested order of troubleshooting procedures when you have an issue with the server.

Step	Troubleshooting Task	Link
1	Gather initial service visit information.	Gather Information for Service Information to Gather for Troubleshooting
2	Investigate any power-on problems.	Troubleshoot Power Problems
3	Perform <i>external</i> visual inspection.	Inspect the External System
4	Perform <i>internal</i> visual inspection.	Inspect the Internal System
5	Look at the Oracle ILOM Summary Information page and the Open Problems page in the web interface. Replace any failed components.	View Open Problems on a System (Web)
6	Run HWdiag commands to test system components.	Using the Oracle ILOM Diag Shell
7	Run UEFIdiag to execute a quick diagnostic and detect problems on all CPU, memory, disk drives, and I/O devices.	Using UEFI Diagnostics

System Diagnostics and Troubleshooting Scenarios

Run diagnostic tests to verify the operation of a server when it is newly installed, when it is upgraded or modified, and when it fails. The following sections list the common testing scenarios:

- [New System](#)
- [Upgraded System](#)

- Production System

New System

- Before installing options into a new system, run these diagnostic tests in the following order:
 - HWdiag
 - UEFIdiag

Tests failed: If the tests identify a server failure:

- Check the server Product Notes or Release Notes for the product or option for any known conditions that might cause a diagnostic test to fail.
- If the solution to the problem is not in the Product Notes or Release Notes, assume that the server was damaged in shipment. Terminate the installation process, and notify Oracle Service personnel. This ensures that the server is covered under warranty.

If you experience a network connectivity problem when placing a server into service for the first time, ensure that the network access point for the server is activated.

Tests passed: If the server passes the tests and has no optional components to install, you can place the server into service.

If the server passes the test and you have optional components to install, install the options and re-run the tests.

- If the server passes the test with the new components installed, you can place the server into service.
- If the diagnostic tests reveal that a newly installed component is faulty, remove the component and return the component for replacement.

Upgraded System

1. Before installing a server upgrade (memory, hard disk drives, I/O cards, or power supply) to an in-service server, take the server out of service and run these diagnostic tests in the following order:
 - HWdiag
 - UEFIdiag
2. Install the server upgrade.
3. In Oracle ILOM Health Status, view Open Problems to determine and fix any errors or faults.
4. Run the HWdiag and UEFIdiag diagnostic tests again.
 - **Tests failed:** If the diagnostic tests fail, one of the installed options was faulty or the server was damaged when you installed the option. In either case, remove and replace the faulty component, run the diagnostic tests again to confirm that the problem has been corrected, and place the server into service.
 - **Tests passed:** Place the server into service.

 **Note:**

If the failed component is a non-replaceable component on the server's motherboard, return the motherboard to Oracle for repair, or order a replacement motherboard and have it installed in the field by authorized Oracle Service personnel.

Production System

If the server has been operating problem-free for a long time, and then the Fault-Service Required indicator LED on the server illuminates, do the following:

1. Check Oracle ILOM for Open Problems. See [Administering Open Problems](#).
2. If you find an open problem, take the appropriate action to repair or replace the faulty component.
Oracle ILOM typically clears open problems after you repair or replace the faulty component.
3. If the problem is not resolved, remove the AC power cords from the server and press the Fault Remind button on the motherboard, which illuminates any internal Fault LEDs and indicates which CRU or FRU is faulty.
4. If the failed component is a customer-replaceable unit (CRU), replace it. For x86 servers, CRUs are defined in the server Service Manual and the Oracle System Handbook. You must have an account to access the handbook.

You can access the Oracle System Handbook from [My Oracle Support](#).

5. If the failed component is a field-replaceable unit (FRU), initiate a service request with Oracle Service. FRUs are defined in the server Service Manual and Oracle System Handbook.

 **Note:**

If the failed component is a non-replaceable component on the server motherboard, return the motherboard to Oracle for repair, or order a replacement motherboard and have it installed in the field by authorized Oracle Service personnel.

Preliminary Troubleshooting Procedures

This section describes the troubleshooting actions that might help you identify problems quickly and prepare for the more extensive troubleshooting procedures.

- [Check for Known Issues](#)
- [Gather Information for Service](#)
- [Troubleshoot Power Problems](#)
- [Inspect the External System](#)
- [Inspect the Internal System](#)

Check for Known Issues

Product Notes and Release Notes documents provide information about late-breaking issues or problems. They include a description of each issue or problem and methods to repair or work around it.

1. Check the server Product Notes or software Release Notes for known issues related to the problem you are trying to fix.

You can often find the problem and its solution in the Product Notes or the Release Notes.

Product Notes and Release Notes sometimes contain information about the diagnostic tools themselves. For example, they might say that under certain circumstances, a specific diagnostic test failure can be ignored.

2. If you find the problem described in the document, follow the instructions to repair it or work around it.

Often, following the instructions in the Product Notes or the Release Notes is the first and last step in troubleshooting a problem with your server.

Gather Information for Service

Next, gather information from the service call or the on-site personnel.

1. Collect information about the following items:

- Events that occurred before the failure
- Whether any hardware or software was modified or installed
- Whether the server was recently installed or moved
- How long the server exhibited symptoms
- The duration or frequency of the problem

2. Document the server settings before you make any changes.

If possible, make one change at a time to isolate potential problems. In this way, you can maintain a controlled environment and reduce the scope of troubleshooting.

3. Record the results of any change you make. Include any errors or informational messages.
4. Check for potential device conflicts, especially if you added a new device.
5. Check for version dependencies, especially with third-party software.

For more information, see [Information to Gather for Troubleshooting](#).

Troubleshoot Power Problems

If the server does not power on:

1. Check that AC power cords are attached firmly to the server power supplies and to the AC sources.
2. Check the power supply (PS) Fault LED on the power supplies. If the PS LED is lit, that power supply is in a faulted state.

3. Check that the System OK LED on the server front panel is steady on, which indicates the server is in Main power mode. If it is blinking, the server is in Standby power mode.

For instructions to bring the server to Main power mode, refer to the server Installation Guide.

4. Check the system for faults using Oracle ILOM.
5. Run the hwdiag cpld vr_check test and inspect the output for errors.

This test checks the complex programmable logic device (CPLD). For information about the HWdiag utility, see [Using the Oracle ILOM Diag Shell](#).

Inspect the External System

1. Inspect the external status indicator LEDs, which can indicate component malfunction. For the LED locations and descriptions of their behavior, refer to the server Service Manual.
2. Verify that nothing in the server environment is blocking airflow or making a contact that could short out power.
3. If the problem is not evident, continue with Inspect the Internal System.

Inspect the Internal System

1. Choose a method for shutting down the server from Main power mode to Standby power mode.
 - **Graceful shutdown:** Press and release the On/Standby button on the front panel. This causes Advanced Configuration and Power Interface (ACPI)-enabled operating systems to perform an orderly shutdown of the operating system. Servers not running ACPI-enabled operating systems shut down to Standby power mode immediately.
 - **Emergency shutdown:** Press and hold the On/Standby button for five seconds to force Main power off and enter Standby power mode.

When the system is in Standby power mode, the System OK LED blinks.

Caution:

When the server is in Standby power mode, power is still directed to the service processor board and the power supply fans. To remove power completely, disconnect the AC power cords from the server back panel.

2. Remove the chassis top cover to view the server internal components.
Refer to the server Service Manual for details.
3. Inspect the internal status indicator LEDs, as described in the Service Manual.
4. Verify that there are no loose or improperly seated components.
5. Verify that all cable connectors inside the system are firmly and correctly attached to their appropriate connectors.
6. Verify that any after-factory components are qualified and supported.

For a list of supported PCIe cards and memory modules (DIMMs), refer to the server Service Manual and Product Notes.

7. Check that the installed DIMMs comply with the supported DIMM population rules and configurations.

Refer to the server Service Manual for information about DIMMs.

8. Replace any faulty component.

Refer to the server Service Manual for component remove and replace procedures.

9. To restore Main power mode to the server, that is, all components powered on, press and release the On/Standby button on the server front panel.

When Main power is applied to the full server, the System OK LED next to the On/Standby button blinks intermittently until BIOS POST finishes, then the LED is steady on.

10. If the problem with the server is not evident, view the BIOS event logs during system startup.

Oracle ILOM Diagnostics

This section includes the following topics about Oracle ILOM diagnostics:

- [Using Oracle ILOM to Monitor a System and Diagnose Components](#)
- [Health State Definitions](#)
- [Administering Open Problems](#)
- [Using the Fault Management Shell](#)
- [Managing Oracle ILOM Log Entries](#)
- [Using the Oracle ILOM Diag Shell](#)
- [Using a Non-Maskable Interrupt](#)
- [Using the Snapshot Utility](#)

For comprehensive information about Oracle ILOM, refer to [Systems Management Documentation](#).

Using Oracle ILOM to Monitor a System and Diagnose Components

When something goes wrong with a system, diagnostic tools can help you to determine what caused the problem. However, this approach is inherently reactive. It means waiting until a component fails. Oracle ILOM provides diagnostic tools that allow you to be more proactive by monitoring the system while it is still “healthy.” Monitoring tools give you early warning of imminent failure, thereby allowing planned maintenance and better system availability. Remote monitoring is also a convenient way to check the status of many machines from one centralized location.

Using Oracle ILOM, you can view detailed information about the overall health of a system and the status of system components. In addition, you can monitor open problems and close fault status. Oracle ILOM also provides access to informational system management log files.

To monitor a system or diagnose components, see:

- [View System-Level Information and Health Status \(Web\)](#)
- [View System-Level Information and Health Status \(CLI\)](#)
- [View Subsystem and Component Information and Health Status \(Web\)](#)
- [View Subsystem and Component Information and Health Status \(CLI\)](#)

View System-Level Information and Health Status (Web)

The system-level health status properties for a server are viewable from the Summary Information page in the web interface.

1. To view system-level health status details, click **System Information** → **Summary**.

The **Summary Information** page appears.

2. To collect system information about the system, review the entries in the **General Information** table.

Information in the General Information table includes the model number, serial number, system type, firmware currently installed, primary operating system installed, host MAC address, IP address for the SP, and MAC address for the SP.

 **Note:**

The property value for the Primary Operating System installed on the server shows only when the Oracle ILOM Hardware Management Pack is installed on the server.

3. To identify problems detected on the system or to view the total problem count, review the entries in the Status table.

The overall health status and total problem count appear at the top of the table.

To view additional information about a component category reported in the **Status** table, click the link in the **Subsystem** column.

4. To view the current firmware on the system, click **System Information** → **Firmware**.

View System-Level Information and Health Status (CLI)

You can view the host system-level health status properties from the command-line interface (CLI) under the `/System` target.

- To collect system-level information or to verify the system health status, type `show /System`.

For example:

```
Properties:
  health = OK
  health_details = -
  open_problems_count = 0
  type = Rack Mount
  model = ORACLE SERVER X9-2
  qpart_id = Q13015
  part_number = 7336847-B2
  serial_number = 1715XC4010A
  rfid_serial_number = changeme
  system_identifier = (none)
  system_fw_version = 5.0.0.21
  primary_operating_system = Not Available
  primary_operating_system_detail = Comprehensive System monitoring is
  not available. Ensure the host is running with the Hardware Management
  Pack. For details go to http://
  www.oracle.com/goto/ilom-redirect/hmp
  host_primary_mac_address = 00:10:e0:b5:df:ba
  ilom_address = 10.129.129.183
  ilom_mac_address = 00:10:E0:B5:DF:BE
  locator_indicator = Off
  power_state = Off
```

```
actual_power_consumption = 66 watts
action = (Cannot show property)
```

 **Note:**

The property value for the primary operating system installed on the managed device is shown only when the Oracle ILOM Hardware Management Pack is installed on the managed device.

View Subsystem and Component Information and Health Status (Web)

The subsystem and component health status properties for a server are viewable from the Summary Information page in the web interface.

Installation of Oracle Hardware Management Pack is required for the following:

- To view health and inventory status properties on the Networking page for InfiniBand network controllers.
- To view the majority of the health and inventory status properties on the **Storage** page and to view the controller **Type** property or the controller **Details** properties (such as, Location; World Wide Name (WWN) for FC Controllers; and, Number Of Ports).
- 1. To view subsystem and component health status properties, click **System Information** → category-name.

For example, the navigation pane shows a list of subsystems such as Processors, Memory, Power, Cooling, and Storage. To view server component health status details for Processors, click **System Information** → **Processors**.

2. On the component category page, you can:

- Determine the overall health for the subsystem category and the number of components installed for each category.
- Determine the health details and the installed location for each component currently installed on the server.

On some servers, you can also enable and disable components from the component category page. For further information about enabling or disabling subcomponents on your Oracle server, refer to the Oracle ILOM documentation.

- View further information about the installed component by clicking the **Details** link in the table.

View Subsystem and Component Information and Health Status (CLI)

You can view the health status properties for subsystems and components from the command-line interface (CLI) under the `/System` target.

- To access subsystem and component health details from the CLI, type `show /System/category-name`.

Where `category-name` equals one of the subsystem target names under `show /System`.

For example:

- To view the subsystem health status for memory modules (DIMMs) on a server, type `show /System/Memory`

```
/System/Memory
Targets:
  DIMMs

Properties:
  health = OK
  health_details = -
  installed_memory = 16 GB
  installed_dimms = 2
  max_dimms = 16
```

```
Commands:
  cd
  show
```

- To view the subsystem health status for a specific DIMM on a server, type `show /System/Memory/DIMMs/DIMM_0`.

```
/System/Memory/DIMMs/DIMM_0
Targets:

Properties:
  health = OK
  health_details = -
  part_number = 07075400,M393A4K40CB2-CTD
  serial_number = 00CE0117490324CDF0
  location = P0/D0 (CPU 0 DIMM 0)
  manufacturer = Samsung
  memory_size = 32 GB
  type = DDR4 SDRAM

Commands:
  cd
  show
```

Health State Definitions

The following status descriptions reported by Oracle ILOM pertain to the health state of the system or components. For information on how to fix open problems, see [Administering Open Problems](#).

Health Status State	Description
Not Available	Oracle ILOM is unable to provide a health status for this component. Oracle ILOM might require Oracle Hardware Management Pack to be installed. For more information, refer to Systems Management Documentation .
OK	The system or component is in good working order.

Health Status State	Description
Offline	<p>Applies to the Prepare to Remove action state of a subcomponent. This status appears when the action property is set to Prepare to Remove and the physical subcomponent is not physically removed from the chassis.</p> <p>Note: Not all subsystems managed by Oracle ILOM support properties for service actions (Prepare to Remove or Return to Service).</p>
Warning	Oracle ILOM presents informational warning messages to indicate that a minor problem has been detected on system. Despite any warning messages, the system is functioning as expected and the informational message can be safely ignored.
Degraded	Oracle ILOM indicates a Degraded state for a parent component if one or more of its subcomponents are disabled. The parent component continues to participate in the operation of the system in a limited capacity.
Disabled	<p>Oracle ILOM presents a Disabled state when one of the following conditions occurs:</p> <ul style="list-style-type: none"> • A fault was not detected on the component; however, Oracle ILOM has determined that the component should not participate in the operation of the system. • An end-user has manually disabled the component. <p>If a Disabled health state appears, view the Health Details property for the component.</p>
Disabled (Service Required)	<p>Oracle ILOM has detected a fault on the component and disabled it. A service action is required to enable the disabled component.</p> <p>If a Disabled (Service Required) health state appears, view the Health Details property provided for the component.</p>
Service Required	<p>Oracle ILOM has detected a problem on the system that will require a service action to resolve the issue.</p> <p>If this status appears at the system level, view the open problems detected on the system in the Oracle ILOM web interface or CLI.</p> <p>If this status appears in the Open Problems table, refer to the URL provided in the table for further details.</p>

Administering Open Problems

Oracle ILOM automatically detects system hardware faults and environmental conditions on a system. If a problem occurs on a system, Oracle ILOM automatically:

- Illuminates the Fault-Service Action Required LED on the physical server.
- Identifies the faulted condition in an easy-to-read Open Problems table.
- Records system information about the fault condition in the event log.

Upon the repair (or the replacement) of a faulty field-replaceable unit (FRU) or customer-replaceable unit (CRU), Oracle ILOM typically clears the fault state from the Open Problems table. On some devices, it does not do this. For these devices, refer to the server Service Manual.

For further information about administering open problems that are detected and reported in Oracle ILOM interfaces, see:

- [View Open Problems on a System \(Web\)](#)

- [View Open Problems on a System \(CLI\)](#)

View Open Problems on a System (Web)

Open problems detected on a host server are viewable from the Open Problems web page.

1. To view the server Open Problems web page, click **Open Problems**.

The **Open Problems** page displays a list of open problems.

ID	Date/Time	Subsystem	Component
1	Mon Oct 28 10:29:37 2020	Memory	P1/D8 (CPU 1 DMM 8)
2	Mon Oct 28 10:29:37 2020	Memory	P1/D9 (CPU 1 DMM 9)
3	Mon Oct 28 10:29:42 2020	Processor	P1 (CPU 1)

2. Review the Open Problems web page for the following information:

- Total number of problems detected
- Time stamp, subsystem, and location for each faulted component
- URL for troubleshooting a faulted component

3. To fix problems, repair or replace any faulty devices.

Oracle ILOM typically clears open problems after the indicated device is repaired or replaced. On some devices, it does not do this. For these devices, refer to the server Service Manual.

View Open Problems on a System (CLI)

Open problems detected on a server are viewable under the `/System/Open_Problems` CLI target.

1. To view server open problems, type `show /System/Open_Problems`.

A display similar to the following appears.

```
-> show /System/Open_Problems

Open Problems (3)
Date/Time          Subsystems      Component
-----            -----
Thu Oct 31 21:39:49 2018  Processors    P1 (CPU 1)
                        A processor has detected a QuickPath Interconnect (QPI) transmitter
                        uncorrectable error. (Probability:33,
                        UUID:9468d451-5d8b-412a-fe51-e35c76cc5894, Part Number:CM80636,
                        Serial
                        Number:N/A, Reference
                        Document:http://support.oracle.com/msg/SPX86A-8002-79)
Thu Oct 31 21:39:49 2018  Processors    P2 (CPU 2)
                        A processor has detected a QuickPath Interconnect (QPI) transmitter
                        uncorrectable error. (Probability:33,
```

```

UUID:9468d451-5d8b-412a-fe51-e35c76cc5894, Part Number:CM80636, Serial
Number:N/A, Reference
Document:http://support.oracle.com/msg/SPX86A-8002-79)
Thu Oct 31 21:39:49 2018 Processors P3 (CPU 3)
A processor has detected a QuickPath Interconnect (QPI) transmitter
uncorrectable error. (Probability:33,
UUID:9468d451-5d8b-412a-fe51-e35c76cc5894, Part Number:CM80636, Serial
Number:N/A, Reference
Document:http://support.oracle.com/msg/SPX86A-8002-79)

```

2. Review the Open Problems properties for the following information:

- Total number of problems detected
- Time stamp, subsystem, and location for each faulted component
- URL for troubleshooting a faulted component

3. To fix problems, repair or replace any faulty devices.

Oracle ILOM typically clears open problems after the indicated device is repaired or replaced. On some devices, it does not do this. For these devices, refer to the server Service Manual.

Using the Fault Management Shell

You can use the Oracle ILOM Fault Management Shell to view faults and determine the components affected by the faults.

The Oracle ILOM `fmadm faulty` command is the preferred method to display fault or defect information and determine the FRUs involved.

View Faults Using the Fault Management Shell

1. From the Oracle ILOM CLI, to launch the Oracle ILOM Fault Management Shell, type `start /SP/faultmgmt/shell`.
2. To display the commands available in the Fault Management Shell, type `help`.
3. To display information about the components, type `fmadm faulty`.

In the following example, the output shows one faulty CPU.

The `Affects` and `Status` lines identify the component affected by the fault and its relative state. In this example, a single CPU is affected. It is marked "faulted".

Beneath the `Status` information, the data for the impacted FRU (field-replaceable unit) displayed. The location string (also called the FRU label) is "/SYS/MB/P0." It should match the label on the physical hardware or the value displayed by Oracle ILOM.

The `Status` of the FRU displays as `faulty`.

The Action section might also include other specific actions instead of, or in addition to, the usual reference to the `fmadm` command.

```

-> start /SP/faultmgmt/shell
Are you sure you want to start /SP/faultmgmt/shell (y/n)? y

faultmgmtsp> help

Built-in commands:
echo - Display information to user.

```

```
Typical use: echo $?
help - Produces this help.
      Use 'help <command>' for more information about an external
      command.
exit - Exit this shell.

External commands:
fmadm - Administers the fault management service
fmdump - Displays contents of the fault and ereport/error logs
fmstat - Displays statistics on fault management operations

faultmgmtsp> fmadm faulty
-----
-----
Time          UUID          msgid
Severity

-----
2000-06-18/22:39:23 00cbca46-d34d-6938-ba47-d9f69e8ccceb SPX86A-8007-Q1
Critical

Problem Status      : open
Diag Engine        : fdd 1.0
System
  Manufacturer    : Oracle Corporation
  Name             : ORACLE SERVER X9-8
  Part_Number     : 7336847-B2
  Serial_Number   : 1715XC4010A

System Component
  Firmware_Manufacturer : Oracle Corporation
  Firmware_Version      : (ILOM)5.1.0.0
  Firmware_Release      : (ILOM)2018.03.16

-----
Suspect 1 of 1
  Problem class   : fault.chassis.fw.platform-info.invalid
  Certainty       : 100%
  Affects         : /SYS/SMOD0/MB
  Status          : faulted

  FRU
    Status        : faulty
    Location       : /SYS/SMOD0/MB
    Manufacturer  : HON HAI PRECISION INDUSTRY CO LTD
    Name          : SMOD TOP LEVEL ASSY
    Part_Number   : 7339666
    Revision      : 07
    Serial_Number : 465136N+1743PJ001J
    Chassis
      Manufacturer : Oracle Corporation
      Name         : ORACLE SERVER X9-8
      Part_Number  : 7336847-B2
      Serial_Number: 1715XC4010A

  Description : The BIOS has detected that the platform information structure
                (SPI flash) is invalid.

  Response     : The chassis wide service-required LED is illuminated.

  Impact       : The system is unable to power on. BIOS does not have valid
```

platform information to boot properly.

Action : Please refer to the associated reference document at <http://support.oracle.com/msg/SPX86A-8007-Q1> for the latest service procedures and policies regarding this diagnosis.

Repairing Faults or Defects

After Oracle ILOM Fault Management identifies a faulted component in your system, you must repair it. A repair can happen in one of two ways: implicitly or explicitly.

- An *implicit repair* can occur when the faulty component is replaced or removed, provided the component has serial number information that the Fault Manager daemon can track. The system's serial number information is included so that the Fault Manager daemon can determine when components have been removed from operation, either through replacement or other means (for example, *blacklisting*). When such detections occur, the Fault Manager daemon no longer displays the affected resource in `fmadm faulty` output.
- An *explicit repair* is required if no FRU serial number is available. For example, CPUs have no serial numbers. In these cases, the Fault Manager daemon cannot detect a FRU replacement.

Use the `fmadm` command to explicitly mark a fault as repaired. The options include:

- `fmadm replaced label`
- `fmadm repaired label`
- `fmadm acquit label`
- `fmadm acquit uuid [label]`

Although these four commands can take UUIDs or labels as arguments, it is better to use the label. For example, the label `/SYS/MB/P0` represents the CPU labeled "P0" on the motherboard.

If a FRU has multiple faults against it and you want to replace the FRU only one time, use the `fmadm replaced` command against the FRU.

`fmadm replaced` Command

You can use the Oracle ILOM `fmadm replaced` command to indicate that the suspect FRU has been replaced or removed.

If the system automatically discovers that a FRU has been replaced (the serial number has changed), then this discovery is treated in the same way as if `fmadm replaced` had been typed on the command line. The `fmadm replaced` command is not allowed if `fmadm` can automatically confirm that the FRU has not been replaced (the serial number has not changed).

If the system automatically discovers that a FRU has been removed but not replaced, then the current behavior is unchanged: The suspect is displayed as `not present`, but is not considered to be permanently removed until the fault event is 30 days old, at which point it is purged.

`fmadm repaired` Command

You can use the Oracle ILOM `fmadm repaired` command when some physical repair has been carried out to resolve the problem, other than replacing a FRU. Examples of such repairs include reseating a component or straightening a bent pin.

`fmadm acquit` Command

Often you use the Oracle ILOM `fmadm acquit` option when you determine that the resource was not the cause. Acquittal can also happen implicitly when additional error events occur, and the diagnosis gets refined.

Replacement takes precedence over repair, and both replacement and repair take precedence over acquittal. Thus, you can acquit a component and then subsequently repair it, but you cannot acquit a component that has already been repaired.

A case is considered repaired (moves into the `FMD_CASE_REPAIRED` state and a `list.repaired` event is generated) when either its UUID is acquitted, or all suspects have been either repaired, replaced, removed, or acquitted.

Usually `fmadm` automatically acquits a suspect in a multi-element suspect list, or Oracle Support Services gives you instructions to perform a manual acquittal. You would only want to acquit by label if you determined that the resource was not guilty in all current cases in which it is a suspect. However, you can allow a FRU to be manually acquitted in one case while remaining a suspect in all others, using the following option, which enables you to specify both UUID and label:

```
fmadm acquit uuid [label ]
```

Managing Oracle ILOM Log Entries

Oracle ILOM maintains four system management logs: system log, event log, and audit log. For further details about these logs, see the following topics:

- [Log Descriptions](#)
- [Log Properties](#)
- [Log Time Stamps](#)
- [View and Clear Log Entries \(Web\)](#)
- [View and Clear Log Entries \(CLI\)](#)
- [Filter Log Entries \(Web\)](#)
- [Filter Log Entries \(CLI\)](#)

Log Descriptions

Log	Description
System	The top-level <i>system log</i> presents a subset of relevant operational event log entries. Specifically, this log reports subsystem-level diagnostic events pertaining to system inventory actions and component health. These events can include power on and off, FRU insertion and removal, as well as health status events, such as service required, warning, or OK.
Event	The <i>event log</i> tracks informational, warning, or error messages about a system such as the addition or removal of a component or the failure of a component. The event properties recorded in the event log can include: the severity of the event, the event provider (class), and the date and time the event was logged. The event log is helpful for troubleshooting the system when problems occur. It is also helpful for monitoring the performance of the system.
Audit	The <i>audit log</i> tracks all interface-related user actions, such as user logins, user logouts, configuration changes, and password changes. The user interfaces monitored for user actions include the Oracle ILOM web interface, CLI, Fault Management Shell, Restricted Shell, Diagnostics Shell, and SNMP and IPMI client interfaces. The audit log is helpful for auditing user activity to ensure that no privilege violations have occurred.

Log Properties

Property	Description	Applicable to:
Event ID	Unique number used to identify the encountered event.	<ul style="list-style-type: none"> System Log Event Log Audit Log
Date and Time	Day and time the event occurred. If the Network Time Protocol (NTP) server is enabled to set the Oracle ILOM time, the Oracle ILOM clock uses Universal Coordinated Time (UTC). For more information about time stamps, see Log Time Stamps .	<ul style="list-style-type: none"> System Log Event Log Audit Log
Event Type or Type	<p>Hardware-dependent event property.</p> <p>Event type examples:</p> <ul style="list-style-type: none"> IPMI UI Upgrade Persistence Action or Service Required Warning OK 	<ul style="list-style-type: none"> System Log Event Log Audit Log

Property	Description	Applicable to:
Subsystem	<p>Hardware-dependent property that identifies the subsystem where the event was encountered.</p> <p>Subsystem examples:</p> <ul style="list-style-type: none"> • System • Power • Cooling • Memory • Storage • I/O module • Processor • Firmware 	<ul style="list-style-type: none"> • System Log
Component	<p>Hardware-dependent property that identifies the component where the event was encountered.</p> <p>Component examples:</p> <ul style="list-style-type: none"> • Hostn • /SYS (Host System) • PSn (Power Supply n) • Fann (Fan n) • Diskn (Disk n) • Oracle ILOM 	<ul style="list-style-type: none"> • System Log
Class	<p>Hardware-dependent property that identifies the event class.</p> <p>Class examples:</p> <ul style="list-style-type: none"> • Audit/Log – For commands that result in a configuration change. Description includes user, command, command parameters, and success/failure. • IPMI/Log – For any event that is placed in the IPMI System Event Log is also put in the management log. • Chassis/State – For changes to the inventory and general system state. • Chassis/Action – For shutdown events for a server, hot insert/removal of FRU components. • Fault/Fault – Description gives the time fault was detected and the suspect component name. • Fault/Repair – For Fault Management repairs. Description gives component name. 	<ul style="list-style-type: none"> • Event Log • Audit Log
Severity	<p>Severity level of the event.</p> <p>Severity examples:</p> <ul style="list-style-type: none"> • Debug • Down • Critical • Major • Minor 	<ul style="list-style-type: none"> • Event Log • Audit Log

Log Time Stamps

Local system time stamps, by default, are captured in the Oracle ILOM log files by using the host server system clock UTC/GMT time zone. However, if a log file is viewed from a remote client that is located in a different time zone, Oracle ILOM automatically adjusts the time stamps in the log files to reflect the local time zone of the remote client and the host system. In this case, two time stamps appear in the log for each listed event entry. In addition to supporting local system time stamps, Oracle ILOM enables you to capture remote router time stamps using a Network Time Protocol (NTP) server. For information about the way to modify how Oracle ILOM captures time stamps for logged entries, refer to the *Oracle ILOM Administrator's Guide for Configuration and Maintenance* at [Systems Management Documentation](#).

View and Clear Log Entries (Web)

Oracle ILOM log entries for a server are viewable from the Oracle ILOM web interface.

1. Verify that you have Admin (a) role privileges, which are required to clear log entries.
2. To view the log entries, perform one of the following:
 - To view the system log entries, click **System Information** → **System Log**.
 - To view the event or audit log entries, click **ILOM Administration** → **Logs**, and then click the **Event** or **Audit** tab.

The selected Oracle ILOM log page appears.

3. To clear all log entries shown, click the **Clear Log** button in the log table, and then click **OK** in the message box that appears.

Oracle ILOM removes all entries in log file.

View and Clear Log Entries (CLI)

1. Verify that you have Admin (a) role privileges, which are required to clear log entries.
2. To view a tabular list of log entries, do one of the following:
 - For the system log, type `show /System/Log/list`.
 - For the event log, type `show /SP/Logs/event/list`.
 - For the audit log, type `show /SP/Logs/audit/list`.

To scroll through a list, press any key except the q key.

3. To clear log entries shown, type `set target clear=true`, and then type y at the prompt.

For example:

- `set /System/Log clear=true`
- `set /SP/logs/event/ clear=true`
- `set /SP/logs/audit clear=true`

Filter Log Entries (Web)

1. Select **System Information** → **Logs**.

2. Select either a standard filter or a custom filter from the **Filter** list.

For further details about filtering log entries shown in the web interface, click the **More Details** link on the web page.

Filter Log Entries (CLI)

- From the CLI, issue the show command followed by one or more supported log filter properties.

For example:

- To filter the system log entries by subsystem or Event Type, type one of the following:

```
show /System/Log/list Subsystem== subsystem  
show /System/Log/list Type== type
```

- To filter the event or audit log entries by Class, type `show / SP/logs/|event|audit /list Class== class`.

- To filter the event or audit log entries by Class and Type, type `show /SP/ logs|event|audit /list Class== class Type== type`.

- To filter the event or audit log entries using all the filter properties, type `show /SP/logs event|audit /list Class== class Type== type Severity== value`.

Where:

- subsystem* is the subsystem component name, for example: System, Cooling, or Processor.
- type* is the event name or the component name where the event occurred, for example: OK, Warning, Service Required, Fan*n*, Processor*n*, DIMM*n*, UI, Product, Log, Update, or Action.
- class* is the class event name, for example: System, Fault, Chassis, Software, Audit, BIOS, or Sensor.
- severity* is the event severity, for example: Debug, Down, Critical, Major, or Minor.
- event|audit* indicates a choice between the event and audit log. Type `event` to filter the event log, or type `audit` to filter the audit log.

Related Topics

- [Log Properties](#)
- [View and Clear Log Entries \(Web\)](#)
- [View and Clear Log Entries \(CLI\)](#)

Using the Oracle ILOM Diag Shell

At the Oracle ILOM CLI prompt, you can run HWdiag commands to check the status of a system and its components, and access HWdiag logs. Depending on the server, see [Run HWdiag \(CLI\)](#) to use one of the methods to access the Diag shell.

This section contains the following topics:

- [Run HWdiag \(CLI\)](#)
- [Using HWdiag Commands](#)
- [HWdiag Commands and Options](#)
- [HWdiag Logs](#)

For information about Oracle ILOM, refer to the Oracle ILOM Documentation Library at [Systems Management Documentation](#).

Run HWdiag (CLI)

1. Depending on your Oracle server, do one of the following to access a diag shell:
 - For Oracle X4, X5, and X6 servers, at the Oracle ILOM CLI prompt, access the Restricted shell:

```
set SESSION mode=restricted
```
 - For Oracle X7, X8, and X9 servers, access /SP/diag/shell:

```
-> start /SP/diag/shell
Are you sure you want to start /SP/diag/shell (y/n)? y
```
2. At the diag> prompt, type diag> hwdiag parameters
HWdiag commands use the form `hwdiag main_command [subcommand ...]`.
For details, see [HWdiag Commands and Options](#).
3. Choose any of the following ways to display help for HWdiag options and commands:
 - To display an overview of HWdiag options and main commands, type `help hwdiag`.
 - To display all HWdiag main commands and their subcommands, type `help hwdiag -h`.
 - To display the command structure with all options available by command, type `help hwdiag -h -v`.
 - To display help specific to a main-command, type `help hwdiag -h main command`.
4. In the SP/Diag shell, type any of the following commands:
 - To display the external commands available in the SP/Diag shell, type `help`.
 - To display information, type `echo`, for example, `echo $?`.
 - To exit the SP/Diag shell, type `exit`.
 - To run hardware diagnostics, type `hwdiag`.
 - To list the diagnostics log directories and files, type `ls`.
 - To print the content of the diagnostics log files, type `cat`.

Using HWdiag Commands

This section describes how to use the HWdiag command line.

HWdiag commands use the form `hwdiag main-command [subcommand ...]`.

For example:

```
[(flash)root@ORACLESP-1234567:~]# hwdiag led get /SYS/MB/P1/D8/SERVICE
HWdiag - Build Number 117435 (May 01 2019, 17:05:36)
        Current Date/Time: January 04 2019, 10:52:31
LED                         VALUE
-----
/SYS/MB/P1/D8/SERVICE       : off
```

Many subcommands require an additional subcommand to identify the actual device or devices being acted on. This *target* can be an individual device or `all`, which represents all the valid targets for the subcommand. In the above example, `hwdiag led get /SYS/MB/P1/D8/SERVICE` returns the state of a single LED. If you enter `hwdiag led get all`, it displays the state of all the system LEDs.

 **Note:**

Main commands and subcommands are case insensitive. However, `hwdiag` is not. For example, `hwdiag led get all` is the same as `hwdiag LED GET ALL`.

If you enter an incomplete command line, the HWdiag utility displays the syntax for the command and a list of valid subcommands. Use this information to re-enter the command with a complete and valid set of parameters and subcommands.

The following display shows an example.

```
diag> hwdiag temp
HWdiag - Build Number 81018 (January 12 2019 at 00:42:14)

Syntax: hwdiag temp ...

get [all|<sensor>]
      - Display Temperature Sensor Reading
info [all|<sensor>]
      - Display Temperature Sensor Information

diag> hwdiag temp get
HWdiag - Build Number 81018 (January 12 2019 at 00:42:14)

Syntax: hwdiag temp get all|<sensor>

Valid Options for Temperature :
ALL                         /SYS/MB/T_IN_PS
/SYS/MB/P0                  /SYS/MB/T_IN_ZONE1
/SYS/MB/P1                  /SYS/MB/T_IN_ZONE2
/SYS/MB/P2                  /SYS/MB/T_IN_ZONE3
/SYS/MB/P3                  /SYS/MB/T_IN_ZONE4
/SYS/MB/T_CORE_NET01        /SYS/MB/T_OUT_SLOT1
/SYS/MB/T_CORE_NET23        /SYS/T_FRONT

diag> hwdiag temp get all
```

```
HWdiag - Build Number 81018 (January 12 2019 at 00:42:14)
DEVICE          TEMP
-----
/SYS/MB/P0      : 64.00 margin
/SYS/MB/P1      : 64.00 margin
/SYS/MB/P2      : 63.00 margin
/SYS/MB/P3      : 64.00 margin
/SYS/MB/T_CORE_NET01 : 38.75 deg C
/SYS/MB/T_CORE_NET23 : 38.00 deg C
/SYS/MB/T_IN_PS   : 26.75 deg C
/SYS/MB/T_IN_ZONE1 : 30.75 deg C
/SYS/MB/T_IN_ZONE2 : 30.75 deg C
/SYS/MB/T_IN_ZONE3 : 29.50 deg C
/SYS/MB/T_IN_ZONE4 : 28.25 deg C
/SYS/MB/T_OUT_SLOT1 : 29.75 deg C
/SYS/T_FRONT     : 24.50 deg C
```

HWdiag Commands and Options

The following tables list the HWdiag utility commands and options.

 **Note:**

Not all commands are available on all platforms. To find out which commands are available on your system, enter `hwdiag -h`.

HWdiag Commands

Component	Action	Options	Description and Options
cpld			CPLD, FPGA tests, and utilities.
	reg	all fgpa	Dump CPLD registers.
	vr_check		Print voltage regulator status.
	log read <i>number_of_last_entries</i>		Read the last three entries from the cpld log file.
	mbus		(X9-8 only) Check MBUS status.
cpu			Display CPU information.
	capid all cpu		Decode CAPID values for CPU.
	info all cpu	-v	Dump CPU devices and display coding for all registers.
	pirom_info all cpu		Dump PIROM CPU information.
fan			Fan test and utilities.
	get	-m	Display fan RPM.
	info	-r	Display fan presence information.

Component	Action	Options	Description and Options
gpio			GPIO utilities.
	get all <i>gpio_pin</i>		Get information about GPIO pin.
i2c			Test the sideband i2c topology.
	scan all <i>bus</i>		Display accessible i2c devices.
	test all <i>bus</i>		Test connectivity of platform i2c devices. This test returns a pass or fail.
io			IO tests and utilities.
	nvme_info	-v	Display information from VPD and MI for NVMe devices.
	nvme_test	-v	Check for PCIe link width and speed of NVMe drives and NVMe add-in-cards.
led			Get information about LEDs.
	get all <i>led</i>		Display the state of LEDs.
	info all <i>led</i>		Display information about LED registers.
mem			Display memory (DIMM) information.
	info all <i>dimm_name</i>		Display memory configuration.
	spd all <i>dimm_name</i>	-r	Display DIMM SPD information, such as size, speed, and voltage. The information displayed varies according to manufacturer.
pci			PCIe tests and utilities.
	dump		Read PCIe registers. dump <socket> <bus> <dev> <func> [std ext][<offset> <count>] <ul style="list-style-type: none"> • std reads the entire space • ext reads the extended space • <offset><count> specifies a single register
	info all <i>device</i>	-r	Display PCIe link information for all, or for a single device.
	read		Read the specified PCIe register. read <socket> <bus> <dev> <func> <offset>

Component	Action	Options	Description and Options
	scan		Scan all PCIe devices.
	status all <i>pci-target(s)</i>		Print status of pci-target(s)
power			Display power information.
	get		Display sensor readings. get amps volts watts all sensor.
	info all sensor		Display information about voltage reduction devices (VRD). sensor identifies an individual sensor.
system			Display system information.
	summary		Display system summary.
	fabric test all cpu		Test the system fabric, including QPI bus speed, PCIe link speed, and memory frequency.
	info		Display system configuration information.
	port80 <i>number_of_last_codes</i>	-m	Display host boot progress. Optionally, enter the number of last codes to show the last codes for port80.
	rtc		Display the real time clock (RTC).
	thermal	-m, -r	Display system thermal information, including temperatures, fan speeds, and power.
	version		Display the version of system components.
temp			Display temperatures.
	get all sensor		Display temperature sensor readings.
	info all sensor		Display information about temperature sensors.

HWdiag Command Options

The following table lists the HWdiag command options.

Option	Long	Description
-f	force	Force execution of a command regardless of prerequisites.*
-h	help	Display help test.
-i	interactive	Prompts when you use it with a main command.*

Option	Long	Description
-l	log <filename>	Enable HWdiag to start logging to <filename>. Note: Use -t to add time stamp to logging.
-m	monitor <.1 sec>	Set monitoring interval in increments of tenths of a second (.1 second). Overrides current monitoring interval.*
-n	numberloop	Set the number of loops to run a command continually.
-p	persist	Use persistent hardware presence data for all invocations of any HWdiag command.
-q	quiterr	Exit HWdiag utility immediately after an error occurs.
-r	raw	Modify HWdiag output for easier parsing.*
-s	sampleint	Sample interval in seconds to set the number of seconds of sleep between collecting data samples. Use only with -n option.
-t	timestamp	Add time stamp to logging. Use with -l option.
-u	unit [1,2,4]	Control the output format of dump subcommands. Options are 1 byte (default), 2 byte, or 4 byte format.*
-v	verbose	Enhance the verbosity of output.*
-x	exclude	Exclude a feature.*

 **Note:**

*Implement the HWdiag command option only on subcommands. For details on the syntax, refer to the subcommand documentation or display the help by typing `help hwdiag -hv`.

HWdiag Logs

In addition to running the HWdiag utility commands, you can access and display the content of the HWdiag log files. The commands `ls` and `cat` are available in the Oracle ILOM SP/Diag shell.

To read the content of the logs use the `cat` command. For example, type `cat hwdiag/hwdiag_i2c_test.log`.

Using a Non-Maskable Interrupt

Sending a non-maskable interrupt (NMI) to the host operating system can cause the host to stop responding and wait for input from an external debugger. Use this feature only when requested to do so by Oracle Service personnel.

 **Caution:**

Do not send an NMI to the host operating system unless requested to do so by Oracle Service personnel.

To generate an NMI, see:

- [Generate a Non-Maskable Interrupt \(Web\)](#)
- [Generate a Non-Maskable Interrupt \(CLI\)](#)

Generate a Non-Maskable Interrupt (Web)

 **Note:**

The setting for generating a non-maskable interrupt from Oracle ILOM might not be supported on all Oracle servers.

 **Caution:**

Depending on the host OS configuration, generating an NMI might cause the OS to crash, stop responding, or wait for external debugger input.

1. Obtain permission from Oracle Service prior to performing this procedure.
2. To generate an NMI from the Oracle ILOM interfaces, verify that you have Reset and Host Control (r) privileges.
3. From the Oracle ILOM web interface, click **Host Management** → **Diagnostics**.
4. On the Diagnostics page, to send an NMI to the host, click the **Generate NMI** button.

Generate a Non-Maskable Interrupt (CLI)

 **Note:**

The setting for generating a non-maskable interrupt from Oracle ILOM might not be supported on all Oracle servers.

 **Caution:**

Depending on the host OS configuration, generating a non-maskable interrupt (NMI) might cause the OS to crash, stop responding, or wait for external debugger input.

1. Obtain permission from Oracle Service personnel before performing this procedure.
2. To generate an NMI from the Oracle ILOM interfaces, verify that you have Reset and Host Control (r) privileges.
3. To send an NMI to the host, from the Oracle ILOM CLI, type `set /HOST/generate_host_nmi=true`.

Using the Snapshot Utility

⚠ Caution:

The purpose of the Oracle ILOM Snapshot feature is to collect data for use by Oracle Service personnel to diagnose system problems. Customers must not run this utility unless requested to do so by Oracle Service personnel.

The Snapshot feature in Oracle ILOM enables you to collect information about the current state of the service processor (SP). This information can include environmental data, logs, and information about field-replaceable units installed on the server. In addition, you can use Snapshot to run diagnostics on the host and capture the diagnostics log files.

The output from Snapshot is saved as a standard zip file or an encrypted zip file to a location you specify.

To use the Snapshot feature, see the following procedures:

- [Take a System Snapshot \(Web\)](#)
- [Take a System Snapshot \(CLI\)](#)
- [Decrypt an Encrypted Snapshot File](#)

Take a System Snapshot (Web)

⚠ Caution:

The purpose of the Oracle ILOM Snapshot utility is to collect data for use by Oracle Service personnel to diagnose system problems. Customers must not run this utility unless requested to do so by Oracle Service personnel.

1. Obtain permission from Oracle Service personnel before performing this procedure.
2. Verify that you have Admin(a) role privileges, which are required to collect SP data using the Snapshot utility.
3. From the Oracle ILOM web interface, click **ILOM Administration** → **Maintenance** → **Snapshot**.
4. On the **Snapshot** page, in the **Data Set** list, select one of the following options:
 - **Normal** – Collect information about Oracle ILOM, the host operating system, and the hardware configuration.
 - **FRUID** – Collect information about installed FRUs, in addition to the data set collected for Normal. The FRUID option enables Oracle Service personnel to analyze data in a binary format about FRUs.

- **Full** (might reset the host) – Collect the maximum amount of data from the host, and initiate diagnostics on the host. This option could cause the server to reset.
- **Custom** – Specify which of the following data sets to capture:
 - Oracle ILOM data
 - Hardware data
 - Diagnostic data (This option might require a host reset.)
 - Basic OS data
 - FRUID data

5. Configure the following output properties:

- **Collect Only Log Files From Data Set** – Enable (select) this option to collect only log files. Disable (deselect) this option to capture log files and additional information about the SP state.
- **Encrypt Output File** – Enable (select) this option to encrypt the output file. When encryption is enabled, you are prompted for an encryption passphrase. To decrypt an encrypted output file, you will need to know the passphrase.
Deselect this option to produce a non-encrypted output file. To decrypt an encrypted output file, see [Decrypt an Encrypted Snapshot File](#).

6. In the Transfer Method list box, select one of the following options:

- **Browser** – Specify the output destination in a browser window.
- **SFTP** – Specify the SFTP host, your user name and password on the host, and the output file destination.
- **FTP** – Specify the FTP host, your user name and password on the host, and the output file destination.
- **FTPS** – Specify the FTPS host, your user name and password on the host, and the output file destination
- **TFTP** – Specify the TFTP host and the output file destination.
- **HTTP** – Specify the HTTP host, your user name and password on the host, and the output file destination.
- **HTTPS** – Specify the HTTPS host, your user name and password on the host, and the output file destination.

7. Click **Run**.

When the Snapshot is complete, the Save As dialog box appears prompting you to save the output file.

8. Specify the output directory in the **Save As** dialog box, and then click **OK**.

Take a System Snapshot (CLI)

⚠ Caution:

The purpose of the Oracle ILOM Service Snapshot utility is to collect data for use by Oracle Service personnel to diagnose system problems. Customers must not run this utility unless requested to do so by Oracle Service personnel.

1. Obtain permission from Oracle Service personnel before performing this procedure.
2. Verify that you have Admin(a) role privileges, which are required to collect SP data using the Snapshot utility.
3. Issue the following command to specify what kind of data the Snapshot utility should collect:

```
-> set /SP/diag/snapshot dataset= value
```

Where *value* can be one of the following:

- normal – Collect information about Oracle ILOM, host operating system, and hardware configuration.
- normal-logonly – Collect only log files.
- FRUID – Collect information about installed FRUs, in addition to the data set collected for Normal.
- fruid-logonly – Collect only log files.
- full – Collect the maximum information about the server. This option could cause the server to reset.
- full-logonly – Collect only log files.

4. To specify whether the Snapshot data should be encrypted, type:

```
-> set /SP/diag/snapshot encrypt_output= [true|false]
```

 **Note:**

When the `encrypt_output` property is set to `true`, you must type an encryption password at the prompt in order to start the data collection. Later, you must type an encryption password at the prompt in order to decrypt the output file. To decrypt an encrypted output file, see [Decrypt an Encrypted Snapshot File](#).

5. To start the data collection, type `set /SP/diag/snapshot dump_uri=protocol://username:password@host/directory`.

The transfer protocol can be `sftp`, `ftp`, `ftps`, `tftp`, `http`, or `https`.

For example, to store the Snapshot information through `FTP` in a directory named `data` on the host, type `set /SP/diag/snapshot dump_uri=ftp://username:mypassword@host-ip-address/data`.

 **Note:**

The `directory` is relative to the user's login; therefore, in the previous example, the full path to `data` is probably `/home/username/data`.

Decrypt an Encrypted Snapshot File

1. Using a terminal window that supports openssl commands, navigate to the directory that contains the Snapshot output file.
2. Issue the decryption command, type `openssl aes-128-cbc -d -md sha1 -in encryptedSnapshotFilename.zip.e -out snapshotFilename.zip`.
3. When prompted, type the encryption passphrase.

Using UEFI Diagnostics

This section describes how to use the Unified Extensible Firmware Interface (UEFI) diagnostic tests provided through Oracle Integrated Lights Out Manager (ILOM). Use UEFI diagnostics to test and detect problems on motherboard components, drives, ports, and I/O cards.

 **Note:**

The UEFI diagnostics information in this section is intended for only servers supporting UEFI boot mode.

This section includes the following topics:

- [UEFI Diagnostics Test Modes](#)
- [Udiag Commands](#)

UEFI Diagnostics Test Modes

Use UEFI diagnostic tests to diagnose server problems and determine root causes of system problems.

You can use either the Oracle ILOM web interface or the command-line interface (CLI) to run UEFI diagnostics. From Oracle ILOM, you select the level of test that you want to perform.

You can run UEFI diagnostics in one of the following modes:

UEFI Diagnostics Test Mode	Description
Disabled	UEFI diagnostics do not run. Use this selection for normal system operation. After you run UEFI diagnostics tests in Manual mode, stop UEFI Diagnostics, and select Disabled mode to recover the original system status.
Enabled	The server boots automatically and executes a predefined test suite without user intervention. Test output is logged to the uefidig directory, which you can view in the Oracle ILOM diag shell. After the diagnostic tests complete, the system automatically shuts down and returns to Disabled diagnostics mode. Use Enabled mode as a quick test for first-time field installation and prior to installing mission-critical applications to verify system quality. These basic tests typically take between 10 minutes and 1.5 hours, depending on the system configuration.

UEFI Diagnostics Test Mode	Description
Extended	<p>The server boots automatically and executes a comprehensive test suite without user intervention. Test output is logged to the uefidig directory, which you can view in the Oracle ILOM diag shell. After the diagnostic tests complete, the system automatically shuts down and returns to Disabled diagnostics mode.</p> <p>Use Extended mode for first-time system installation, after physically transporting the system, any time you add components, and prior to installing production operating systems and mission-critical applications. These extended tests typically take between 15 minutes and 3 hours, depending on the system configuration.</p>
Manual	<p>The server boots to the UEFI shell. Type <code>udiag -hv</code> to display the UEFI Diagnostics commands. View the test output using a remote console or a serial console. After the tests are complete, manually return the diagnostics mode to <code>Disabled</code>.</p>

Run UEFI Diagnostics Automatically (Web)

1. Verify that you have Reset and Host Control (r) role privileges, which you need to diagnose system hardware issues.
2. Optionally, to monitor the progress of diagnostic tests in Enabled or Extended mode, perform these steps.
 - a. Log in to the Oracle ILOM command-line interface (CLI).
 - b. At the Oracle ILOM CLI prompt, type `set SESSION mode=restricted`.

For example:

```
-> set SESSION
mode=restricted
```

WARNING: The "Restricted Shell" account is provided solely

to allow Services to perform diagnostic tasks.

```
[(restricted_shell) ORACLESP-465136N+2001A50002:~]# sp_trace_view -r
EFIDIAG
[(restricted_shell) ORACLESP-465136N+2001A50002:~]# sp_trace_view -r
EFIDIAG -L
EFIDIAG 2020-05-13 18:59:26.591813 2788 configuefidiags.sh
CONFIGURING: Configuring UEFI
Diagnostics
EFIDIAG 2020-05-13 18:59:29.764280 2788 configuefidiags.sh
CONFIGURING: Host Powered
on

EFIDIAG 2020-05-13 18:59:33.888400 2820 checkuefidiags.c:428
CONFIGURING: Selected Diags Mode:
manual
EFIDIAG 2020-05-13 18:59:33.888893 2820 checkuefidiags.c:439
```

```

CONFIGURING: Loading virtual
disk
EFIDIAG 2020-05-13 18:59:39.747206 2872 runuefidiags.sh
CONFIGURING: Waiting for BIOS to boot UEFI
shell
EFIDIAG 2020-05-13 19:00:54.847515 2872 runuefidiags.sh
CONFIGURING: Configuration done, booting into UEFI
Shell
EFIDIAG 2020-05-13 19:00:54.927147 2872 runuefidiags.sh
TESTING: Status - Manual mode configured

```

3. Power the server to Standby power mode:
 - a. In the Oracle ILOM web interface, click **Host Management** → **Power Control**.
 - b. In the **Select Action** list select a **Power Off** option, and then click **Save**.
The System OK LED on the front panel is blinking.
4. Start a video or serial console redirection:
 - a. In the navigation pane, click **Remote Control** → **Redirection**.
 - b. Select a redirection: **Video** or **Serial**.
 - c. Click **Launch Remote Console**.
Several dialog boxes might appear. Click to accept them, as necessary.
A redirection window appears when the redirection is established. For video redirection, ensure that Full Control appears in the title bar of the remote console window.
5. Click **Host Management** → **Diagnostics**.
6. On the Diagnostics page, perform the following steps:
 - a. In the **Mode** list, select **Enabled** or **Extended** mode.
For details about the diagnostic levels, see [UEFI Diagnostics Test Modes](#).
 - b. Click **Save**.
The Start Diagnostics button is enabled.
 - c. Click **Start Diagnostics**.
An informational message about controlling diagnostics through the remote console application appears.

 **Note:**

As UEFI diagnostics boot, you might see messages stating that you can use function keys to interrupt the boot process. These messages do not apply to UEFI diagnostics. Do not press any function keys when starting the UEFI diagnostics.

- d. Click **OK** to clear the message and proceed with the diagnostic tests.
The Diagnostics Status field shows the progression of the configuration phases for the system component under evaluation, including the test results. If there is an internal error, you can abort the test (see Step 6e) or wait for ILOM to detect the error and restore the system to Disabled mode, which could take more than one hour. The Diagnostics Status field shows the updated status for any diagnostic phase.

If you are running Enabled or Extended diagnostics, the tests run automatically.

 **Note:**

The boot process can take several minutes, and might include an extra power cycle.

 **Note:**

To check the history of the test using Oracle ILOM event log, select **ILOM Administration** → **Logs** → **Event** → **Filter** → **Custom Filter** → **Event Type** → **Diags**.

 **Caution:**

Do not disrupt the test progress by changing the server power state. If there is an unexpected AC power cycle and a test is in progress, configure Diagnostics mode again starting from Step 3. Internal variables could be corrupted and setting a new mode or resetting the same mode fixes any potential issue.

- e. To safely disrupt the diagnostic tests, click **Stop Diagnostics**.

 **Note:**

When you stop running the diagnostic tests, wait approximately 40 seconds while Oracle ILOM is searching for CPU errors, before you enter another command. Because you stopped running the diagnostics, you can change the Diagnostics mode or resume the same mode.

- f. View the UEFI Diagnostics logs. See [UEFI Diagnostic Logs](#).

 **Caution:**

Before you perform a different task, verify that the UEFIdiag Status shows the test result and UEFIdiag Mode is set to Disabled. On earlier x86 Oracle servers, a restore process runs, which could take longer than one minute.

Run UEFI Diagnostics Automatically (CLI)

1. Verify that you have Reset and Host Control (r) role privileges, which you need to diagnose system hardware issues.

2. Optionally, to monitor the progress of diagnostic tests in Enabled or Extended mode, perform these steps.
 - a. Log in to the Oracle ILOM command-line interface (CLI).
 - b. At the Oracle ILOM CLI prompt, type `set SESSION mode=restricted`.

For example:

```
-> set SESSION
mode=restricted
```

WARNING: The "Restricted Shell" account is provided
solely

to allow Services to perform diagnostic
tasks.

```
[(restricted_shell) ORACLESP-465136N+2001A50002:~]# sp_trace_view -r EFIDIAG
[(restricted_shell) ORACLESP-465136N+2001A50002:~]# sp_trace_view -r EFIDIAG -L
EFIDIAG 2020-05-13 18:59:26.591813 2788 configuefidiags.sh
CONFIGURING: Configuring UEFI
Diagnostics
EFIDIAG 2020-05-13 18:59:29.764280 2788 configuefidiags.sh
CONFIGURING: Host Powered
on
EFIDIAG 2020-05-13 18:59:33.888400 2820 checkuefidiags.c:428
CONFIGURING: Selected Diags Mode:
manual
EFIDIAG 2020-05-13 18:59:33.888893 2820 checkuefidiags.c:439
CONFIGURING: Loading virtual
disk
EFIDIAG 2020-05-13 18:59:39.747206 2872 runuefidiags.sh
CONFIGURING: Waiting for BIOS to boot UEFI
shell
EFIDIAG 2020-05-13 19:00:54.847515 2872 runuefidiags.sh
CONFIGURING: Configuration done, booting into UEFI
Shell
EFIDIAG 2020-05-13 19:00:54.927147 2872 runuefidiags.sh
TESTING: Status - Manual mode configured
```

3. To access the UEFI shell, start a serial console redirection:
 - a. Log in to the Oracle ILOM command-line interface (CLI).
 - b. Type `start /HOST/console`.
 - c. To start the host console, type `y`.
4. In a new ILOM CLI session, power off the server.
 - a. Type `stop /SYS`.
 - b. To stop the system, type `y`.

The System OK LED on the front panel is blinking.
5. to verify that the host is in Standby power mode, type `show /System/ power_state`.

The System OK LED on the front panel is blinking.

The power state displays as Off.

6. To change the directory to /HOST/diag, type `cd /HOST/diag`.
7. Enter the `set mode=<mode>` command to choose one of the following UEFI diagnostic modes:
 - Enabled
 - Extended

For example, to run UEFI diagnostics tests in Enabled mode, type: `set mode=enabled`.

8. Start the UEFI diagnostics.
 - a. Type `start /HOST/diag`.
 - b. To start the UEFI diagnostics, type `y`.

The server automatically boots and starts UEFI diagnostic tests. No more action is necessary.

 **Note:**

As UEFI diagnostics boot, you might see messages stating that you can use function keys to interrupt the boot process. These messages do not apply to UEFI diagnostics. Do not press any function keys when starting the UEFI diagnostics.

The Diagnostics Status field indicates the progression of the configuration phases, system component under evaluation, and test results. If there is an internal error, you can abort the test (see Step 10) or wait for ILOM to detect the error and restore the system to Disabled mode, which could take more than one hour. The Status field is updated accordingly.

 **Note:**

If you are running diagnostics in Enabled or Extended mode, the tests run automatically, and stop automatically, and change the /HOST/diag mode back to Disabled.

9. To view the progress of the diagnostic tests, type `show /HOST/diag status`.

 **Caution:**

Do not disrupt the test progress by changing the server power state. If there is an unexpected AC power cycle and a test is in progress, configure Diagnostics mode again starting from Step 3. Internal variables could be corrupted and setting a new mode or resetting the same mode fixes any potential issue.

10. Stop the diagnostic tests.
 - a. Type `stop /HOST/diag`.
 - b. To stop the UEFI diagnostics, type `y`.

 **Note:**

When you stop running the diagnostic tests, wait approximately 40 seconds while Oracle ILOM is searching for CPU errors, before you enter another command. You can change the Diagnostics mode or resume the same mode.

11. To resume running the diagnostic tests:
 - a. Type `start /HOST/diag`.
 - b. To start the UEFI diagnostics, type `y`.

 **Note:**

To check the history of the test using ILOM Event logs, type: `show /SP/logs/event/list/ type==diags`.

12. View the UEFI Diagnostics logs. See UEFI Diagnostic Logs.

 **Caution:**

Before you perform a different task, verify that the UEFIdiag Status shows the test result and UEFIdiag Mode is set to Disabled. On earlier x86 Oracle servers, a restore process runs, which could take longer than one minute.

The following example shows output from the UEFI Diagnostics log.

```
-> ls

/HOST/diag
Targets:
  data
  shell

Properties:
  mode = disabled
  status = RESTORING: Restore process done
or

Properties:
  mode = disabled
  status = RESTORING: Restore process done and BIOS settings Restored
```

UEFI Diagnostic Logs

The Enabled mode and Extended mode generate test results and log files that provide details about what occurred during the test time. The shell that you can use to access and display the diagnostic logs varies, depending on the server.

Oracle Server	Diagnostic shell
X9-2, X9-2L	<code>/HOST/diag/shell</code>

Oracle Server	Diagnostic shell
X7-2, X7-2L, X7-2c, X7-8, X8-2, X8-2L, X8-8	/SP/diag/shell-
X5-2, X5-2L, X5-4, X5-8, X6-2, X6-2L	Restricted Shell

To access and display the content of the UEFI diagnostic log files, use one of the following methods, depending on the server.

Oracle Server X9

```
-> start -script /HOST/diag/shell/
udiaglog> ls -l
-rw-rw-rw- 1 root 0 0 Oct 15 19:33 PASSED.stress_test
-rw-r--r-- 1 root 0 28 Oct 15 19:33 done
-rw-r--r-- 1 root 0 3068 Oct 15 19:33 system.info
-rw-r--r-- 1 root 0 20118 Oct 15 19:33 system.inv
-rw-r--r-- 1 root 0 9949 Oct 15 19:33 test.log
-rw-r--r-- 1 root 0 28 Oct 15 19:33 uefi_started
-rw-r--r-- 1 root 0 35836 Oct 15 19:34 uefidiaq.log
```

Oracle Server X7, X8

```
-> start -script /SP/diag/shell/
diag> ls -l uefidiaq
-rw-rw-rw- 1 root 0 0 Jan 30 21:55 PASSED.stress_test
-rw-r--r-- 1 root 0 28 Jan 30 21:55 done
-rw-r--r-- 1 root 0 496 Jan 30 21:48 sensor.txt
-rw-r--r-- 1 root 0 2633 Jan 30 21:55 system.info
-rw-r--r-- 1 root 0 18876 Jan 30 21:55 system.inv
-rw-r--r-- 1 root 0 6661 Jan 30 21:55 test.log
-rw-r--r-- 1 root 0 28 Jan 30 21:55 uefi_started
-rw-r--r-- 1 root 0 17583 Jan 30 21:56 uefidiaq.log
```

Oracle Server X5, X6

```
-> set SESSION mode=restricted
```

WARNING: The "Restricted Shell" account is provided solely to allow Services to perform diagnostic tasks.

```
[(restricted_shell) ORACLESP-123456789:~]# ls -l diag/uefidiaq
-rw-rw-rw- 1 root root 0 Oct 15 11:53 PASSED.stress_test
-rw-r--r-- 1 root root 32 Oct 15 11:53 done
-rw-r--r-- 1 root root 4734 Oct 15 11:53 system.info
-rw-r--r-- 1 root root 34111 Oct 15 11:53 system.inv
-rw-r--r-- 1 root root 9326 Oct 15 11:53 test.log
-rw-r--r-- 1 root root 32 Oct 15 11:53 uefi_started
-rw-r--r-- 1 root root 16077 Oct 15 11:55 uefidiaq.log
```

 **Note:**

When using the Snapshot utility, the log files are generated and included automatically.

Run UEFI Diagnostics Manually (Web)

This task provides instructions for running UEFI diagnostics manually from the web interface through a video or serial redirection.

1. Power the server to Standby power mode:
 - a. In the Oracle ILOM web interface, click **Host Management** → **Power Control**.
 - b. In the **Select Action** list select a **Power Off** option, and click **Save**.

The System OK LED on the front panel is blinking.
2. Start a video or serial console redirection:
 - a. In the navigation pane, click **Remote Control** → **Redirection**.
 - b. Select a redirection:
 - Select **Use video redirection**.
 - Select **Use serial redirection**.
 - c. Click **Launch Remote Console**.

Several dialog boxes might appear. Click to accept them, as necessary.

A redirection window appears when the redirection is established. For video redirection, ensure that **Full Control** appears in the title bar of the remote console window.
3. Click **Host Management** → **Diagnostics**.
4. On the Diagnostics page, select the mode and start the diagnostics:

For details about the diagnostic levels, see [UEFI Diagnostics Test Modes](#).

 - a. In the **Mode** list, select **Manual**.
 - b. Click **Save**.

The Start Diagnostics button is enabled.

 - c. Click **Start Diagnostics**.

An informational message about controlling diagnostics through the remote console application appears.

 **Note:**

As UEFI diagnostics boot, you might see messages stating that you can use function keys to interrupt the boot process. These messages do not apply to UEFI diagnostics. Do not press any function keys when starting the UEFI diagnostics.

- d. Click OK to clear the message and proceed with the diagnostic tests.

The **Diagnostics Status** field indicates the progress of the diagnostic tests. In the Video or Serial console, the system displays boot messages, and the following startup messages:

```
Shell> echo -off
```

```
Oracle Enterprise UEFI Diagnostics
```

UEFI Diagnostics X9_2 v2.0.1855 Prod Rel

Last Changed Rev: 1855
Last Changed Date: 2020-09-30 14:28:40 -0700 (Wed, 30 Sep 2020)
Build Date/Time Wed 09/30/2020 14:44:52.93 Pacific Standard Time
02/13/2020
09:34:15 (LOCAL)

The boot process can take several minutes, and might include an extra power cycle.

 **Note:**

To check the history of the test using ILOM Event logs, select **ILOM Administration** → **Logs** → **Event** → **Filter** → **Custom Filter** → **Diags**.

 **Caution:**

If there is an unexpected AC power cycle and a test is in progress, configure Diagnostics mode again starting from Step 1. Internal variables could be corrupted and setting a new mode or resetting the same mode fixes any potential issue.

- e. To safely disrupt the diagnostic tests, click **Stop Diagnostics**.

 **Note:**

When you stop running the diagnostic tests, wait approximately 40 seconds while Oracle ILOM is searching for CPU errors, before you enter another command. Because you stopped running the diagnostics, you can change the Diagnostics mode or resume the same mode.

5. To finish the Diagnostics activities, select **Disabled**, and click **Save**.

 **Caution:**

Before you perform a different task, verify that the UEFIdiag Status shows the test result and UEFIdiag Mode is set to Disabled. On earlier x86 Oracle servers, a restore process runs, which could take longer than one minute.

Run UEFI Diagnostics Manually (CLI)

This task provides instructions for running UEFI diagnostics manually from the CLI through the host console.

1. Log in to the Oracle ILOM command-line interface (CLI).

2. Power off the server:
 - a. Type `stop /SYS`.
 - b. To stop the system, type `y`.
The System OK LED on the front panel is blinking.
3. Start a serial console redirection:
 - a. Type `start /HOST/console`.
 - b. To start the host console, type `y`.
4. Start a new ILOM CLI session, and to change the directory to `/HOST/diag`, type `cd /HOST/diag`.
5. To set manual mode, type `set mode=manual`.
6. Start the UEFI diagnostics:
 - a. Type `start /HOST/diag`.
 - b. To start the UEFI diagnostic, type `y`.

The server automatically boots the Oracle ILOM Host/diag shell. No more action is necessary.

 **Note:**

As UEFI diagnostics boot, you might see messages stating that you can use function keys to interrupt the boot process. These messages do not apply to UEFI diagnostics. Do not press any function keys when starting the UEFI diagnostics.

In the Serial console, the system displays boot messages, and the following startup messages.

```
Shell> echo -off
Oracle Enterprise UEFI Diagnostics
UEFI Diagnostics X9_2 v2.0.1891 Prod Rel
Last Changed Rev: 1891
Last Changed Date: 2020-12-04 17:20:21 -0800 (Fri, 04 Dec 2020)
Build Date/Time Fri 12/04/2020 17:37:22.74 Pacific Standard Time
01/26/2021
00:31:13 (LOCAL)
FS0:\>
```

7. To view the progress of the diagnostic tests in Manual mode, type `show /HOST/diag status`.
The **Diagnostics Status** field indicates the progress of the diagnostic tests.
8. To display the available commands, in the Serial console, type `udiag -hv`.

 **Caution:**

If there is an unexpected AC power cycle and a test is in progress, configure Diagnostics mode again starting from Step 1. Internal variables could be corrupted and setting a new mode or resetting the same mode fixes any potential issue.

9. Stop the diagnostic tests.
 - a. In the ILOM CLI session, type `stop /HOST/diag`.
 - b. To stop the UEFI diagnostics, type `y`.

 **Note:**

When you stop running the diagnostic tests, wait approximately 40 seconds while Oracle ILOM is searching for CPU errors, before you enter another command. You can change the Diagnostics mode or resume the same mode.

10. Optionally, to resume running the diagnostic tests, type `start /HOST/diag`.

 **Note:**

To check the history of the test using Oracle ILOM Event logs, type:
`show /SP/logs/event/list/ type==diags`.

11. To finish the Diagnostics activities, type `set /HOST/diag/ mode=disabled`.

 **Caution:**

Before you perform a different task, verify that the UEFIdiag Status shows the test result and UEFIdiag Mode is set to Disabled. On earlier x86 Oracle servers, a restore process runs, which could take longer than one minute.

The following example shows output from the ILOM CLI session, path `/HOST/diag`.

```
-> ls

/HOST/diag
Targets:
  data
  shell

Properties:
  mode = disabled
  status = RESTORING: Restore process done
or

Properties:
```

```
mode = disabled
status = RESTORING: Restore process done and BIOS settings Restored
```

Udiag Commands

UEFIdiag is a diagnostics environment that uses the UEFI shell to run the Udiag tool on Oracle x86 servers.

 **Note:**

Udiag is sometimes referred to as MP (multiprocessing command).

This section includes the following topics that describe the Udiag tools that run in the UEFI shell:

- [Udiag Command Options](#)
- [Udiag Command Flags](#)
- [Udiag Command Resource Requirements](#)
- [UEFI Diagnostics Output](#)

Udiag Command Options

A Udiag command consists of the following structure: udiag [Flags]* [COMMAND [, COMMAND]*]

Udiag provides the command-line options shown in the following table.

Udiag Command	Udiag Subcommand	Description
cfgtbl		Displays installed UEFI tables.
cpu	{ cpuid info model speed linpack }	Runs tests and displays results about host CPUs (processors).
fpu		Runs tests on floating-point units (FPU) in x64 processors.
graphics	{ info bars grid gradient motion memory text } (X5, X6, X7, X8)	Displays available graphics modes or tests graphics modes.
hiiforms	{ list <form_no> }	Shows available HII forms.
ipmi	{ state diagver getval problems }	Use IPMI functionality to share information with Oracle ILOM.
memory { test info }	{ test info }	Runs tests and displays results about the host memory subsystem.
network		Displays Ethernet interfaces or runs external loopback tests.

Udiag Command	Udiag Subcommand	Description
nvdimm	(X8-2L, X8-8, X9-2L)	Decodes NFIT and PCAT ACPI tables provide information about NVDIMMs.
pci	{ cap disable enable errors find read retrain sbr status toggle write } (X9) { <device-vendor-id> <bus> <dev> <func> <reg> <bus> <dev> <func> <reg> <data> } (X5, X6, X7, X8)	Displays information and verifies the capabilities of PCIe devices.
storage	{ info mst rrt srt rwv }	Runs tests and displays information about system storage devices.
system	{ acpi cpusockets dimmspeed info inventory pelink usbspeed } (X9) { acpi cpusockets info inventory pelink smbios } (X5, X6, X7, X8)	Runs tests and displays information about the system.
tpm	{ info } { info ppll } (X5, X6)	Display basic Trusted Platform Module (TPM) information.
usb		Displays information on USB root hubs and devices.

Udiag Command Flags

UEFI Diagnostics processes flags in two steps. In the first step, the flags that appear before any command (but after `udiag`) are parsed and treated as the setting flags for the command that follows. In the second step, the flags that follow a command are used to override the setting for the command only.

Flag	Parameter	Description
<code>-h, -help</code>		Displays command help information.
<code>-v, -V</code>		Mutually exclusive flags that specify the amount of information commands may output. <code>-v</code> is verbose and <code>-V</code> is very verbose.
<code>-pc</code>	<code><n></code>	Repeats a command until <code><n></code> passes are reached. The default is 1.
<code>-ec</code>	<code><n></code>	Repeats a command until <code><n></code> errors are reached. The default is 0.
<code>-time</code>	<code><n></code>	Limits run to <code><n></code> seconds. The default is 0, which indicates no limit.

Flag	Parameter	Description
-s	<begin>	Specifies a generic 64-bit hexadecimal number that is command-specific. For example, memory tests use it as the lowest address of a memory range to test.
-e	<end>	Specifies a generic 64-bit hexadecimal number that is command-specific. For example, memory tests use it as the highest address of a memory range to test <i>plus one byte</i> .
-np	<n> all	Specifies the number of application processors (APs) to use. The literal <code>all</code> specifies to use all enabled processors.
-ap	<n> [<n>]*	<p>Specifies one or more specific APs to use. The processor number 0 is reserved for the boot strap processor (BSP) and must not be used with this flag.</p> <p>All APs are numbered from 1 through the maximum enabled processors.</p> <p>To find the relationship between the AP number with the socket number, type:</p> <pre>udiag system acpi</pre> <p>For example, <code>-ap 5f'1'10</code> allocates processors 5f, 1 and 10 to a command.</p> <p>Memory tests, for example, allocate the APs in the listed order to the sub-blocks in a test range sequentially starting with the lowest addressed sub-block. A typical application is to generate as much cross traffic on socket interconnects by assigning processors far from their sub-blocks.</p>
-xt		Displays the time you executed the command. (X9, E2, E4 only)

When entering CLI commands, note the following rules:

- Most commands support the `-hv`, `-n`, `-v`, `-V`, `-pc`, and `-ec` flags.
- Application processors-capable commands support the `-np` and `-ap` flags.
- Long running tests such as `memory` and `storage` support the `-time` flag.
- The suffix `*` (for example, `[<n>]*`) after the right bracket indicates 0 or more repeated options.

Udiag Command Resource Requirements

This section describes processor resource requirements and instance limitations that are documented for each UEFI Diagnostics command. The following table provides a description of processor attributes and instance attributes.

To see a detailed command description of a UEFI command resource requirement, in the Oracle ILOM Serial or Video console, at the prompt, type `udiag main-command [subcommand] -hv`.

Resource Requirement	Description
BSP_ONLY	A command runs on the boot strap processor (BSP) only. It must not be run on application processors (APs).
ONE_AP_OR_BSP	A command can run on the BSP or any one of the APs at a time.
ANY_PROC	A command can run on any APs or the BSP.
ONE_INSTANCE_ONLY	Only one instance of a command can be run at a time.
MULTIPLE_INSTANCES	Two or more copies of a command can run simultaneously.

UEFI Diagnostics Output

The UEFI diagnostic output format is the same, whether the output is displayed in a console (Manual mode) or in an output log file (Enabled or Extended mode).

If you experience any diagnostic test failures, contact Oracle Service personnel for assistance with interpreting diagnostic tests output.

 **Note:**

Information-only commands do not display a test result unless an error such as an invalid parameter has been detected.

At the completion of the test, UEFI Diagnostics displays test results in either of the following formats:

- COMMAND_ID: COMMAND_NAME: PASS, FAIL
- COMMAND_ID: COMMAND_NAME: ERROR_STATUS

Where:

- COMMAND_ID – Indicates all command instances that run, sequentially starting at 0.
- COMMAND_NAME – Specifies the hierarchical command name of the command.
- PASS or FAIL, displayed as Pass=<pass_count>, or Fail=<error_count> – Indicates that the test has either passed or failed, and must be consistent with the -pc and -ec flag settings. For example, if a test is invoked with -pc 10, then the execution status displays as Pass=10 if no error was detected.
- ERROR_STATUS, displayed as Time Out, Aborted, Unknown Error, or UEFI_ERROR – Indicates that the command either failed to start a test or encountered a serious error that prevented it from completing the test.

 **Note:**

The `Time Out` status typically indicates a failure for the boot strap processor portion of the command to communicate with the application processor portion of the command. This status must not be confused with the `-time` flag, which places a limit on the amount of test time.

An example of UEFI Diagnostics tests output is shown below.

```
FS0:\> mp memory test addr0
0: memory_test_addr0: Pass=1, Fail=0

FS0:\> mp storage srt all -time 5
Testing: SATA0    Progress: 50% : Passed
Testing: SATA1    Progress: 100% : Passed
Total Progress: 100%

0: storage_srt_all: Pass=2, Fail=0

FS0:\> mp fpu -np all -pc 100
0: fpu      : Pass=100, Fail=0
```

Operating System Diagnostics

If a system passes the power-on self-test (POST), it attempts to boot its operating system (OS) environment.

If you are running the Oracle Solaris operating system, you can use diagnostic commands and access log files from the operating system environment.

After the server is running the OS, you have recourse to run software-based diagnostic tools, which can help you with more advanced monitoring, exercising, and fault isolating capabilities.

To use the operating system diagnostics, see [Core Dump File](#).

For more information about Oracle Solaris operating system diagnostics, refer to the following documentation:

- Troubleshooting System Administration Issues in Oracle Solaris 11.4 – *Troubleshooting System Administration Issues in Oracle Solaris 11.4* in the [Oracle Solaris 11.4 Information Library](#).
- Managing Faults, Defects, and Alerts in Oracle Solaris 11.4 – *Managing Faults, Defects, and Alerts in Oracle Solaris 11.4* in the [Oracle Solaris 11.4 Information Library](#).

Core Dump File

In some failure situations, an Oracle engineer might need to analyze a system core dump file to determine the root cause of a system failure. Although the core dump process is enabled by default, configure your system so that the core dump file is saved in a location with adequate space. You also might want to change the default core dump directory to another locally mounted location so that you can better manage any system core dumps. In certain testing and pre-production environments, this is recommended because core dump files can take up a large amount of file system space.

During a system core dump, the system saves the content of kernel core memory to the dump device. The dump content is compressed during the dump process at a 3:1 ratio; that is, if the system were using 6 Gbytes of kernel memory, the dump file is about 2 Gbytes. For a typical system, the dump device must be at least one third the size of the total system memory.

Swap space is used to save the dump of system memory.

By default, Oracle Solaris software uses the first swap device that is defined. This first swap device is known as the dump device.

For Oracle Solaris software, use `dumpadm` to enable the core dump process. For details, refer to *Troubleshooting System Administration Issues in Oracle Solaris 11.4* in the [Oracle Solaris 11.4 Information Library](#).

For instructions on how to configure and initiate forced crash dumps (kernel core dumps) in x86 Oracle Solaris and collect information for troubleshooting system hangs, go to [My Oracle Support](#), and refer to the Knowledge Article Doc ID 1003085.1.

For Oracle Linux software, use `kdump` to enable the core dump process. For details, refer to the *Oracle Linux Administrator's Guide for Release 7* in [Oracle Linux 7 Documentation](#).

Responding to a Hung System

Troubleshooting a hung x86 Oracle Linux system or Oracle Solaris system can be a difficult process because the root cause of the problem might be masked by false error indications from another part of the system. Therefore, it is important that you carefully examine all the information sources available to you before you attempt any remedy. Also, it is helpful to know the type of hang the system is experiencing. This hang state information is especially important to Oracle Service personnel, when you contact them.

A system "soft hang" can be characterized by any of the following symptoms:

- Usability or performance of the system gradually decreases.
- New attempts to access the system fail.
- Some parts of the system appear to stop responding.

Some soft hangs might dissipate on their own, while others will require that the system be interrupted to gather information. A soft hang responds to a break signal that is sent through the system console.

A system "hard hang" leaves the system unresponsive to a system break sequence. You know that a system is in a hard hang state when you attempt all the soft hang remedies with no success.

See [Troubleshoot a Hung System](#).

A system might not actually be hung due to another condition causing the system to appear to be hung. For example, a network or network share problem, or a power or boot issue could be the cause. For information on how to eliminate conditions that may give the appearance of a system hang, go to [My Oracle Support](#), and refer to the Knowledge Article Doc ID 1012991.1.

Troubleshoot a Hung System

This procedure describes how to troubleshoot a hung system by using the Oracle Linux console and the Oracle Solaris serial console.

1. Verify that the system is hanging.
 - a. Type the `ping` command to determine whether there is any network activity.
 - b. Type the `ps -ef` command to determine whether any other user sessions are active or responding.

If another user session is active, use it to review the contents of the `/var/adm/messages` file for any indications of the system problem.

- c. Try to access the system console through Oracle ILOM.

If you can establish a working system console connection, the problem might not be a true hang but might instead be a network-related problem. For suspected network problems, use the `ping` or `ssh` commands to reach another system that is on the same sub-network, hub, or router. If NFS

services are served by the affected system, determine whether NFS activity is present on other systems.

2. If there are no responding user sessions, record the state of the system LEDs.

The system LEDs might indicate a hardware failure in the system. You can use Oracle ILOM to check the state of the system LEDs. For more information about how to interpret system LEDs, refer to the server Service Manual.

3. To force a kernel core dump on an x86 system, go to [My Oracle Support](#), and refer to the Knowledge Article Doc ID 1003085.1.
4. Review the contents of the `/var/adm/messages` file.

Look for the following information about the system state:

- Any large gaps in the time stamp of operating system software or application messages
- Warning messages about any hardware or software components
- Information from last root logins to determine whether any system administrators might be able to provide any information about the system state at the time of the hang

5. If possible, verify whether the system saved a core dump file.

Core dump files provide invaluable information to your support provider to aid in diagnosing any system problems. For further information about saving core dump files, see [Core Dump File](#).

Troubleshooting Information

There are several troubleshooting options that you can implement when you set up and configure an Oracle x86 server. By setting up your system with troubleshooting in mind, you can save time and minimize disruptions if the system encounters any problems.

This section contains the following troubleshooting options:

- [Updated Product Information](#)
- [Firmware and Software Patches](#)
- [Information to Gather for Troubleshooting](#)
- [System LEDs and Diagnostics](#)
- [Auto Service Requests](#)

Updated Product Information

Oracle gathers and publishes information about the Oracle x86 servers long after the initial system is shipped. You can obtain the most current server troubleshooting information in the Product Notes or Release Notes and at Oracle web sites. These resources can help you understand and diagnose problems that you might encounter.

Product Notes and Release Notes

Oracle x86 server Product Notes and Release Notes documents contain late-breaking information about the systems, including the following:

- Updated hardware and driver compatibility information
- Known issues and bug descriptions, including solutions and workarounds

The latest Product Notes and Release Notes are available as part of the documentation library for the server platform, or operating system.

Oracle x86 Critical Patch Update Guide

Oracle x86 Critical Patch Update Guide contains the latest software release information for Oracle x86 servers, including the following:

- Current recommended and required software patches
- Updated operating system support information
- Fixed/Known issues

Oracle x86 Critical Patch Update Guide is available as part of the documentation library for the server platform.

Information about the latest firmware and Software Release, including tools, drivers, component firmware versions, and bug fixes is available in the ReadMe file for each Software Release.

My Oracle Support

My Oracle Support web site presents a collection of resources for Oracle technical and support information. Access to some of the information on this site depends on the level of your service contract with Oracle.

[My Oracle Support](#) lets you do the following:

- **Search for solutions** – Knowledge articles and alerts about your product and other Oracle products.
- **Download patches and updates** – Everything you need to download and install patches, including tools, product patches, security patches, signed patches, and x86 drivers.
- **Access proactive support tools** – Tools that help you solve problems without having to log a service request, streamline and simplify your daily operations, reduce risks, maximize up-time, and lower your organization's costs through preventative maintenance.
- **Collaborate in the My Oracle Support Community** – Oracle Support Blogs provide product news, technical insight, and how-to information.
- **Learn about Oracle products** – Education resources include how-to training videos, Oracle Support accreditation, live Oracle Adviser webcasts, learning library, training on demand from Oracle University, and Transfer of Information (TOI) online training.
- **Create a service request** – A dashboard where you create, view, and manage service requests, and track the status of bugs associated with a service request.

Firmware and Software Patches

Oracle makes every attempt to ensure that each system is shipped with the latest firmware and software. However, in complex systems, bugs and problems are discovered in the field after systems leave the factory. Often, these problems are fixed with patches to the system firmware. Keeping your system firmware and operating environment current with the latest recommended and required patches can help you avoid problems that others already discovered and solved. Firmware and operating environment updates are often required to diagnose or fix a problem. Schedule regular updates of your system firmware and software so that you do not have to update the firmware or software at an inconvenient time.

You can find the latest patches and updates for Oracle x86 servers at [My Oracle Support](#).

Server Security, Software Releases, and Critical Patch Updates

To ensure continued security of your system, Oracle strongly recommends that you apply the latest Software Releases. Server Software Releases include Oracle ILOM, BIOS, and other firmware updates, often referred to as "patches." Oracle publishes these patches regularly on the My Oracle Support site. Applying these patches helps ensure optimal system performance, security, and stability. You can identify the latest Software Release for your system at [Firmware Downloads and Release History for Oracle Systems](#).

To download a Software Release, go to [My Oracle Support](#).

Oracle notifies customers about security vulnerability fixes for all its products four times a year through the Critical Patch Update (CPU) program. Customers must review the CPU advisories to ensure that the latest software release updates are applied to their Oracle products. Note that updates for Engineered Systems are specifically published for a specific Engineered Systems product (that is, you need not look at specific updates for individual software components included in your Engineered System). For more information about the Oracle CPU program, go to [Critical Patch Updates, Security Alerts and Bulletins](#).

Oracle also recommends that you update to the latest operating system release when it becomes available. Although a minimum operating system release is supported, updating to the latest OS release ensures that you have the most up-to-date software and security patches. To confirm that you have the latest OS release, refer to the Oracle Hardware Compatibility Lists. For information on how to access the Oracle Hardware Compatibility Lists, refer to "Supported Operating Systems" in the Product Notes for your platform.

Oracle x86 Critical Patch Update Guide contains the latest software release information for Oracle x86 servers, and is available as part of the documentation library for the server platform.

For details about the latest system software update, refer to information about getting firmware and software updates in the Product Notes for your platform.

Information to Gather for Troubleshooting

Oracle x86 servers indicate and log events and errors in various ways. Depending on the system configuration and software, certain types of errors are captured only temporarily. Therefore, you must observe and record all available information immediately before you attempt any corrective action. Power-on self-test (POST), for instance, accumulates a list of failed components across resets. However, failed component information is cleared after a system reset. Similarly, the state of LEDs in a hung system is lost when the system reboots or resets.

If you encounter any system problems that are not familiar to you, gather as much information as you can before you attempt any remedial actions. The following tasks provide a basic approach to information gathering.

- Gather as much error indications and messages as possible from the system.
- Review and verify the system operating environment, firmware, and hardware configuration. To accurately analyze error indications and messages, you or an Oracle Service engineer must know the system operating environment and patch revision levels and the specific hardware configuration.
- Compare the specifics of your situation to the latest published information about your system. Often, unfamiliar problems you encounter have been seen, diagnosed, and fixed by others. This information might help you avoid the unnecessary expense of replacing parts that are not actually failing.

System LEDs and Diagnostics

While not a comprehensive diagnostic tool, status indicators (LEDs) located on the chassis and on selected system components can serve as front-line indicators of a limited set of hardware failures.

You can view LED status by direct inspection of the system front and back panels and on some components and ports. You also can view the status of certain LEDs from the Oracle ILOM web interface or command-line interface. The Oracle ILOM Fault Management Shell allows you and Oracle Service personnel to view and manage fault activity on servers and other types of devices.

The green System OK LED indicator and the green SP OK indicator remain lit (no blinking) when the server is in a normal operating state. For any LED color other than green or if the LED is blinking, refer to the Troubleshooting chapter in the Service Manual for your platform.

 **Note:**

Most LEDs available on the front panel are duplicated on the back panel.

Oracle Service Tools Bundle

You can use the Oracle Service Tools Bundle (STB) to expedite problem diagnosis and resolution and for proactive prevention of problems. STB is a self-extracting installer bundle that supports all Oracle Solaris standard operating systems and architectures, enabling you to get the most from your Oracle Premier Support plans. For details on the component parts of STB and where to download the latest version for your Oracle Solaris platform, go to [My Oracle Support](#), and refer to the Knowledge Article Doc ID 1153444.1.

Auto Service Requests

Oracle Auto Service Requests (ASR) is a feature available to customers having Oracle Premier Support and is provided to those customers at no additional cost. Oracle ASR is the fastest way to restore system availability if a hardware fault occurs. Oracle ASR software is secure and customer installable, with the software and documentation downloadable from [My Oracle Support](#). When you log in to My Oracle Support, refer to the "Oracle Auto Service Request" knowledge article document (ID 1185493.1) for instructions on downloading the Oracle ASR software.

When a hardware fault is detected, Oracle ASR opens a service request with Oracle and transfers electronic fault telemetry data to help expedite the diagnostic process. Oracle diagnostic capabilities then analyze the telemetry data for known issues and delivers immediate corrective actions. For security, the electronic diagnostic data sent to Oracle includes only what is needed to solve the problem. The software does not use any incoming Internet connections and does not include any remote access mechanisms.

For more information about Oracle ASR, go to [Oracle Auto Service Request](#).

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