



Apple Server Diagnostics User Guide

For Version 3X109

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Apple Server Diagnostics tests your server for hardware issues.

You can run Apple Server Diagnostics in Extensible Firmware Interface (EFI), which is referred to as *Server Diagnostics EFI*, or in Mac OS X, which is referred to as *Server Diagnostics Mac OS X*.

Run Server Diagnostics EFI to diagnose hardware issues that prevent Mac OS X from successfully starting up. Run Server Diagnostics Mac OS X to remotely diagnose hardware issues or to diagnose issues that are not tested in Server Diagnostics EFI.

Overview of Server Diagnostics configurations

You can install and run Server Diagnostics in the following ways:

Method	Do this because
Use the preinstalled Server Diagnostics EFI	No installation is necessary.
Install Server Diagnostics EFI or Server Diagnostics Mac OS X on a portable storage device	You can use the same portable storage device to test multiple servers.
Install Server Diagnostics EFI or Server Diagnostics Mac OS X on the hard disk	You don't need a portable storage.
Host a NetBoot server	You can use a single Server Diagnostics EFI install image to test multiple servers.

Requirements

Before you can run Server Diagnostics, you must meet installation, local, and remote requirements.

Installation requirements

To install Server Diagnostics, you need the following:

- You need a Mac Pro or Mac mini server with Mac OS X v10.7 or later installed.
- If you're installing onto a portable storage device, you need a USB 2.0 flash drive, or a USB 2.0 or FireWire hard drive.
- If you're installing Server Diagnostics EFI, you need an empty volume with 100 MB of available space but doesn't have Mac OS X installed.
- If you're installing Server Diagnostics Mac OS X, you need an empty volume with 10 GB, which will be used for a dedicated Mac OS X installation.

Local and remote requirements

To run Server Diagnostics remotely, you need:

- A computer with Mac OS X v10.6 or later installed. This computer is referred to as the *host computer*.
- A server with Mac OS X v10.7 or later installed. This server is referred to as the *client server*.
- A network connection with DHCP active from the host computer to the client server.
- If the client server runs Server Diagnostics EFI and uses a network connection, the network connection must use a built-in Ethernet port, not an Ethernet adapter card.
- The client server must have Server Diagnostics installed on an internal volume or on a connected portable storage device, or it must be able to run Server Diagnostics from a NetBoot server.
- The host computer must run Server Diagnostics Mac OS X. The client server can run Server Diagnostics EFI or Server Diagnostics Mac OS X.
- If the client server is running Server Diagnostics Mac OS X, you must be able to log in to the *root* account. The root account gives a system administrator complete access to the server.

NetBoot server requirements

To host Server Diagnostics EFI on a NetBoot server, your NetBoot server must:

- Have Mac OS X v10.7 with server components installed.
- Be on the same subnet as the server being tested.
- Have 100 MB of hard disk space available for a Server Diagnostics NetBoot image.

Before you can run Server Diagnostics, you must set up your testing environment and install Server Diagnostics.

Make sure you meet Server Diagnostics requirements before attempting setup and installation. For information, see “Requirements” on page 6.

Server Diagnostics EFI is preinstalled on the server. The instructions in this chapter show you how to install Server Diagnostics in a different location or set up a NetBoot server.

Install Server Diagnostics EFI

If you perform this task to install Server Diagnostics EFI on an internal volume on the server, you need administrator access to the server. If you perform this task to install Server Diagnostics EFI on a portable storage device, you can use any computer that you have administrator access to.

To install Server Diagnostics EFI:

- 1 Use Disk Utility to set up an empty volume with a partition map scheme of GUID Partition Table, that has at least 100 MB, and that is formatted as MS-DOS (FAT).

For information about using Disk Utility, see *Disk Utility Help*.

- 2 On the server, open AppleServerDiagnosticsEFI.pkg.
- 3 Follow the onscreen instructions and, at the Select Destination step, choose a volume that has at least 100 MB of available space and doesn't have Mac OS X installed.
- 4 If you're asked to authenticate, authenticate as a user with administrator privileges.

Install Server Diagnostics Mac OS X

If you perform this task to install Server Diagnostics Mac OS X on an internal volume, you need administrator access to the server. If you perform this task to install Server Diagnostics Mac OS X on a portable storage device, you can use any computer you have administrator access to.

Installing Server Diagnostics Mac OS X involves three steps:

- Install Mac OS X.
- Copy Server Diagnostics Mac OS X to `/Applications/`.
- Configure Mac OS X.

To install Server Diagnostics Mac OS X:

- 1 Use Disk Utility to set up an empty volume with a partition map scheme of GUID Partition Table and at least 10 GB.

For information about using Disk Utility, see *Disk Utility Help*.

- 2 Install Mac OS X on the empty volume.
- 3 Enable the root user.

For information about enabling the root user, see “Enabling and using the root user in Mac OS X” at support.apple.com/kb/ht1528.

- 4 Log in using the root user name and the password of the user you created in the setup assistant.

You must set up and run Server Diagnostics Mac OS X as root. Otherwise, you can't test the server you've installed Server Diagnostics Mac OS X on.

- 5 Copy the `AppleServerDiagnostics.app` file to the `/Applications/` folder on the server.
- 6 If you're setting up a client server, open a Finder window, select the `/Applications/` folder, choose New Folder from the Action (gear) pop-up menu, and name the folder `AppleServerDiagnosticsClient`.

Client servers are remotely controlled by host computers.

- 7 Open System Preferences (located in `/Applications/`) and change the following options in System Preferences panes.

System Preferences pane	Recommended configuration
Users & Groups	Select the System Administrator account and click Login Items. Click Add (+), select AppleServerDiagnostics.app (typically located in /Applications/), and click Add.
CDs & DVDs	In all pop-up menus, choose Ignore.
Desktop & Screen Saver	In the Screen Saver pane, drag the "Start screen saver" slider to Never.
Energy Saver	In the Sleep pane, drag both sliders to Never and deselect "Put hard disk(s) to sleep when possible."
Mission Control	In all pop-up menus, choose "-."
Software Update	In the Scheduled Check pane, deselect "Check for updates."

If you can't change settings in System Preferences, click the lock button and authenticate.

Set up a NetBoot server

To host Server Diagnostics EFI on a NetBoot server, your NetBoot server must:

- Have Mac OS X v10.7 with server components installed.
- Be on the same subnet as the server being tested.
- Have 100 MB of hard disk space available for a Server Diagnostics NetBoot image.

To use the Server Diagnostics NetBoot image:

- 1 On the server that hosts NetBoot, open AppleServerDiagnosticsNetBoot.pkg and follow the onscreen instructions to install the Server Diagnostics NetBoot image.
- 2 Configure the NetBoot service to serve the image and start the service.

For information about configuring and starting NetBoot, see *Server Admin Help*.

This chapter describes how to start up and use Server Diagnostics.

Before you start up Server Diagnostics, make sure everything is properly installed and configured. For information, see Chapter 2, “Installation.”

Change the startup disk

Server Diagnostics is usually installed on a dedicated volume to minimize the risk of server processes interrupting the tests. Because of this, you must change the startup disk to the volume with Server Diagnostics installed before you can use the tools.

To start up Server Diagnostics, set the startup volume of the server to the volume or disk image containing Server Diagnostics.

You can change the startup disk in the Startup Disk pane of System Preferences. For information about how to change the startup disk in System Preferences, see *System Preferences Help*.

You can also temporarily change the startup disk by holding down a key while starting up the server:

Goal	Hold down this key at server startup
Choose the Server Diagnostics volume before starting up Mac OS X	Option
Start up the preinstalled Server Diagnostics EFI	D
Start up using a Server Diagnostics EFI disk image from the Internet	Command and D
Start up using the Server Diagnostics EFI disk image from a NetBoot server	F1

If a firmware password is enabled and you try to temporarily change the startup volume by holding down the Option key at startup, you must authenticate.

The Startup Disk pane of System Preferences can start up Server Diagnostics Mac OS X, but not Server Diagnostics EFI. You can press the Option key at startup to start up Server Diagnostics Mac OS X or Server Diagnostics EFI.

The server becomes unavailable when you use Server Diagnostics. Before starting tests, alert users that the server will be unavailable.

About Server Diagnostics modes

Server Diagnostics can start up in any of three modes:

Mode	Description	Automatically enters mode if
Host	The computer searches for servers that are on the same subnet and start Server Diagnostics in remote mode. When one is found, the host computer controls Server Diagnostics on the client server.	You run Server Diagnostics Mac OS X and you're not logged in as root.
Client	The server can be controlled by a host computer.	You're running Server Diagnostics EFI and a host computer is on the same subnet or is directly connected.
Local	The server runs all tests locally.	You're running Server Diagnostics EFI, a host computer isn't on the same subnet, and it isn't directly connected.

If you're logged in as root on the server and you run Server Diagnostics Mac OS X, you can choose which mode to enter.

Remotely test a client server

To test a client server, start up Server Diagnostics on the host computer, set it to connect to the client server, start up the Server Diagnostics on the client server, and then set the client server to be a client of the host computer.

The host computer must run Server Diagnostics Mac OS X. The client server can run Server Diagnostics Mac OS X or Server Diagnostics EFI. The available tests are based on which Server Diagnostics the client server is running.

When you start up Server Diagnostics EFI, the server looks for a host computer. If it finds a host computer, the server enters client mode. If it doesn't find a host computer, the server enters local mode.

When you start up Server Diagnostics Mac OS X, the server automatically becomes a host computer if you logged in to Mac OS X with an account that isn't root.

If Server Diagnostics Mac OS X doesn't automatically become a host computer, it asks if it should connect to a client server, be a client of a host computer, or run tests locally.

To remotely test a client server:

- 1 On the host computer, open Server Diagnostics Mac OS X (typically located in /Applications/).
- 2 Choose from the following:
 - If you're logged in as root, when Server Diagnostics Mac OS X opens, a dialog asks you to choose which mode to enter. Choose "Connect to remote server" and click OK.
 - If you're not logged in as root, the dialog doesn't appear, and Server Diagnostics Mac OS X automatically enters host mode.
- 3 On the client server, change the startup disk to a volume with Server Diagnostics and restart it.

You can also temporarily change the startup disk to be a volume with Server Diagnostics on it or to a Server Diagnostics NetBoot disk image when you start up the server.

For information about how to change or temporarily change the startup volume, see "Change the startup disk" on page 10.

- 4 If you're starting up Server Diagnostics Mac OS X, log in as root.
- 5 If Server Diagnostics Mac OS X doesn't open automatically, open the Apple Server Diagnostics application (typically located in /Applications/), choose "Client of a remote host," and then click OK.

If you're starting up Server Diagnostics EFI, the server enters client mode.

- 6 Verify that the host computer and client server have established a successful connection by reviewing the following:
 - The IP address field in the Server Diagnostics window on the host computer should match the IP address assigned to the client server.
 - The name of the Server Diagnostics window on the host computer is "Apple Server Diagnostics remote log," not "Apple Server Diagnostics local log."
 - The log area of the client server uses more of the Server Diagnostics window. Shut Down, Restart, and a few other buttons are removed.

Test the local server using Server Diagnostics EFI

To test the local server, make sure none of the computers on the same subnet as the server running Server Diagnostics Mac OS X is in host mode. If a computer on the same subnet is running Server Diagnostics Mac OS X tools in host mode, the server enters client mode.

To test the local server using Server Diagnostics EFI:

- Restart the server and hold down the Option or F1 key to start up the volume or NetBoot disk image with Server Diagnostics EFI.

For information about how to temporarily change the startup volume while starting the computer, see “Change the startup disk” on page 10.

If Server Diagnostics EFI starts up and doesn't find a host computer, it enters local mode.

Test the local server using Server Diagnostics Mac OS X

To test the local server, you must log in as root. If you don't log in as root, Server Diagnostics Mac OS X enters host mode.

To test the local server using Server Diagnostics Mac OS X:

- 1 Change the startup disk of the server to a volume with Server Diagnostics Mac OS X, restart it, and log in as root.
- 2 If Server Diagnostics Mac OS X doesn't open, open it (typically located in /Applications/).
- 3 When Server Diagnostics Mac OS X opens, choose “Local” from the dialog that appears and click OK.

Use Server Diagnostics EFI

When Server Diagnostics EFI loads, the following screen appears:

The screenshot shows the Apple Server Diagnostics EFI interface for a Mac mini Server (40s). The interface is divided into several sections:

- Test:** A button to start the testing process.
- Status:** Displays the current status, including start and end times, elapsed time, and loop count. It also shows the number of tests selected (59 out of 67).
- Test Options:** A section where users can select tests to run. The tests listed include: AirPort: PCI-E LinkWidth Verification Test, USBPort: USB Port Presence Test (connected USB device required), Processor - L1 Cache Test, SMC: SMC PID Sensor check, Sensor: Sensor test, Ethernet Controller - built-in: MACAddress Verification Test, Memory, and HardDrive.
- Test Results:** A section displaying the results of the tests. It shows the machine type, override file version, system serial number, M&B serial number, boot ROM version, and SMC version. The results indicate that all tests passed, including Custom: Hardware Existence Check, BootROM (test 2), BootROM (test 4), and Product (test 50).

Numbered callouts point to the following elements:

1. Select tests to run.
2. Set test options.
3. Click to start testing.
4. View test results.

Use Server Diagnostics Mac OS X

When Server Diagnostics Mac OS X loads, the following screen appears:

The screenshot shows the Apple Server Diagnostics Mac OS X interface. The interface is divided into several sections:

- System Info:** Displays system information, including IP Address (127.0.0.1).
- View log:** A dropdown menu to view the test log.
- Start Testing:** A button to start the testing process.
- Status:** Displays the current status, including start and end times, elapsed time, and loop count.
- Test Options:** A section where users can select tests to run. The tests listed include: Bluetooth, USB Port: USB Port Device Presence Test (connected USB dev), Sensor: Sensor Reads Within Operating Range, Ethernet Controller: Built-in, Fan: Exhaust, Video Controller, and Hard Drive: Short random multi-block test.
- Test Results:** A section displaying the results of the tests. It shows the test log, including the start and end times, and the results of the tests. The results indicate that all tests passed, including Custom: Hardware Existence Check (test #2) - Hardware Existence, Memory - DIMM0/BANK 0 (test #4) - SMBIOS self-test check, and Memory - DIMM0/BANK 1 (test #4) - SMBIOS self-test check.

Numbered callouts point to the following elements:

1. Select tests to run.
2. Set test options.
3. Click to start testing.
4. View test results.